

# **ANNUAL REPORT 2023-24**



**National Academy of Agricultural Sciences**  
New Delhi



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NASC, DPS Marg, New Delhi - 110012, India

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## PREFACE

The National Academy of Agricultural Sciences (NAAS) has been serving as a think tank since 1990 to guide policy makers and various stakeholders on issues concerning agricultural research, education and extension. It is heartening to note that the Academy during 2023-24 organized brain storming sessions (7), expert consultations (4) and strategy workshops on emerging issues (2). The Academy also organized panel discussions on “Road Map for Indian Agricultural Research, Education and Extension for Amrit Kaal 2047”



and “Empowering SAUs to meet the Emerging Challenges in Agriculture” to develop a blue print for agriculture so as to ensure that the country emerges as a developed Nation by 2047 when it celebrates its ‘Centenary of Independence’. To celebrate 2023 as International Year of Millets, the Academy arranged a virtual workshop on Millets for Food and Nutrition Security in collaboration with World Food Prize Foundation and a National dialogue on “Developing Roadmap for Promoting Millets for Sustainable Agriculture”. An Industry/Investors Meet was also organized to foster collaboration in the areas of agricultural research and development.

The newer initiatives taken by the Academy include Pedagogy Development Programme (PDP) to address the evolving needs of teachers in the changing dynamics of education and more than 300 ICAR scientists were benefitted. In another initiative, meeting with Professional Association of Agricultural Societies (PAAS) was organized to forge greater involvement of PAAS in NAAS activities and improvement in the quality of Society journals. Further, two virtual meetings were held with NAAS Foreign and Pravasi Fellows for their better involvement in NAAS activities. The Academy has decided that every year one common theme will be celebrated and promoted by NAAS and PAAS. Pertinent activities will be organized throughout the year and a conference will be organized in the end of the year. The current year has been identified as the year of ‘Digital Agriculture 2024’.

The Academy successfully organized XVI Agricultural Science Congress (ASC) at Kochi, Kerala on theme of Transforming Agri-Food Systems for Sustainable

Development Goals to address the pressing challenges faced by the agricultural sector. I appreciate the Conveners of the regional chapters for undertaking various activities including brain storming sessions and celebration of World Soil Day and World Milk Day in addition to providing exposure to school students on different aspects of agricultural sciences. I am also happy to note that the Academy took initiative to establish linkages with the Science Academies of India as well as Academies of other countries. Timely publication of NAAS Newsletter, Policy Papers, NAAS Yearbook 2024 and NAAS Yearly Planner is worth appreciating. I am happy to announce that Academy's official journal Agricultural Research has obtained international rating. The Academy also published "State of Indian Agriculture" and "Transformation of Agri-Food Systems".

I place on record my gratitude to the Immediate Past President Dr. T. Mohapatra, and all outgoing and current Office Bearers and Executive Committee members for their guidance and contribution. I appreciate the Executive Director and the members of NAAS Secretariat for their sincere support and dedication in execution of all the activities of the Academy.



**(Himanshu Pathak)**  
*President*

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## ABOUT THE ACADEMY

Inspired by the vision of late Prof B.P. Pal, FRS, the National Academy of Agricultural Sciences (NAAS) was established in 1990 to provide an interactive platform for agricultural scientists from different disciplines – crop husbandry, animal husbandry, fisheries, forestry, engineering and social sciences to deliberate on important issues related to agriculture and rural development; agricultural research, education and extension; and facilitate the provision of evidence-based inputs to policymakers and other stakeholders at different levels of governance. The Academy organizes and supports national and international congresses, conferences, seminars, symposia, workshops and brainstorming sessions on the contemporary issues in agricultural sciences and articulates the role of agricultural research, education and extension in economic development.

The Academy has emerged as a think tank for agricultural science policy in India. The Fellows of the Academy, recognized for their contributions to science, include distinguished personalities in agriculture and allied sciences from India and abroad.

### OBJECTIVES

- To promote ecologically sustainable, economically viable and socially equitable agriculture.
- To recognize and support excellence in scientific research in the field of agriculture.
- To provide promising scientists with the conditions necessary for the advancement of their work.
- To promote contact among research workers in different institutions and organizations within the country and with the world scientific community.
- To organize and undertake inter-disciplinary analyses of issues of importance to farmers, farming and agricultural transformation to strengthen the science-policy interface and bring out documents for the advancement of agricultural research, extension and education for development.
- To secure and manage funds and endowments for the promotion of agricultural sciences.
- To carry out other activities relevant to the accomplishment of the above goals

## Structure of the Academy

- **The General Body:** This Body of the Academy comprises all the Fellows.
- **The Executive Council (EC):** It is the main policy and decision-making body (Annexure III). It is assisted by different Committees to deal with various aspects of governance and activities of the Academy.
- **Regional Chapters:** Twelve Regional Chapters of the Academy are functioning in Barapani, Bengaluru, Bhopal, Coimbatore, Cuttack, Hyderabad, Karnal, Kolkata, Lucknow, Ludhiana, Pune, and Varanasi.

## SCIENTIFIC ACTIVITIES

### *Brainstorming Sessions/Strategy Workshops/Consultation Meetings*

During the year, the following brainstorming sessions/strategy workshops/consultation meetings were organized:

Sl. No.	Title	Convener/ Co-Convener	Date
1.	Experts Consultation on Atmanirbhar Bharat National Clean Plant Programme – India	Dr. V. K. Baranwal	April 03, 2023
2.	Strategy Workshop on Food Safety Strategies for Indian Fisheries Sector	Dr. G. Jeyasekaran	May 17, 2023
3.	Brainstorming Session on Enhancing Agri-Infrastructure and Agri-Business Development through Public-Private Partnerships (PPPs) in India	Dr. Ch. Srinivasa Rao	May 25, 2023
4.	Brainstorming Session on Bio-stimulant Guidelines	Dr. P.K. Chakrabarty and Dr. V. Chinnusamy	July 21, 2023
5.	Expert Consultation on Ethics and Current State of Research Publication	Dr. G. Taru Sharma	August 31, 2023
6.	Brainstorming Session on Greening of Livestock and Poultry Sectors	Dr. B.M. Naveena	September 01, 2023
7.	Expert Consultation on COP 28- Preparedness for Indian Agriculture	Dr. P.K. Aggarwal	September 25, 2023

Sl. No.	Title	Convener/ Co-Convener	Date
8.	Brainstorming Session on Prospects of dsRNA Based Bio-pesticides for Crop Protection in Indian Agriculture	Dr. B. Mandal	September 26, 2023
9.	Strategy Workshop on Honey Bees: The Harbinger for Sweet Revolution	Dr. S.C. Dubey	September 29, 2023
10.	Brainstorming Session on Multiple Uses of Solar Energy in Agriculture and Agro-processing	Dr. N.S.L. Srivastava	October 05, 2023
11.	Brainstorming Session on Restoration and Improvement of Soil Health	Dr. B.S. Dwivedi	October 28, 2023
12.	Brainstorming Session on Smart Animal Farming: Perspective Planning Towards 5 Trillion Economy	Dr. Y.S. Malik	March 22, 2024
13	Expert Consultation on Digital Sequence Information for Agriculture	Prof. Rajeev K. Varshney and Prof. K. C. Bansal	March 26, 2024

## Brainstorming Sessions

### Brainstorming Session (BSS) on “Enhancing Agri-Infrastructure and Agri-Business Development through Public-Private Partnerships (PPPs) in India” (Convener: Dr. Ch. Srinivasa Rao)

A brainstorming session was held in hybrid mode on May 25, 2023 under the chairmanship of Dr. Himanshu Pathak (President, NAAS). The BSS explored the scope for PPP in agri-infrastructure, agri-business development and research, how to nurture PPP in agricultural service delivery, research and development and what policy considerations are needed.



The outcome of deliberations were:

- **Effective Product Takeoff:** Streamline the approval process for agricultural products to expedite their development and launch, with strict compliance measures.
- **Scaling up of Agtechs and Fintechs:** Promote the growth of Agtech and Fintech startups across multiple sectors to foster innovation and technological advancements.
- **Nurturing AIG Linkages:** Strengthen Academia-Industry-Government linkages to facilitate collaborative problem-solving and implementation in agriculture.
- **Vibrancy in Start-up Ecosystem:** Balance funds flow and startup emergence at the national level through sensitization and support for agricultural startups.
- **Strengthening of Incubation Infrastructure:** Utilize CSR funds to bolster incubation centers and sustain their operations.
- **Competence Development:** Organize joint capacity-building programs for developing successful PPP proposals among public and private organizations.
- **Creation of an Innovation Platform:** Establish a collaborative innovation platform involving stakeholders from various sectors to focus on Sustainable Development Goals (SDGs) and specific interventions.

### **Brainstorming Session on “Bio-stimulant Guidelines” (Conveners: Dr. P.K. Chakrabarty and Dr. V. Chinnusamy)**

A brainstorming session in hybrid mode was conducted on Biostimulants at the Academy on July 21, 2023 and was Chaired by Dr. Himanshu Pathak (President, NAAS) and convened by Dr. P.K. Chakrabarty (Former ASRB Member, Plant Sciences) and Dr C. Viswanathan (Joint Director Research, IARI). Following the opening address by Dr. Pathak, the lead talk on the background of biostimulants, guidelines/ data requirement and paramount need for formulating enabling policies to derive maximum advantage of this ecofriendly technology was presented. Based on the subsequent deliberation, following recommendations were made:



1. The Draft Guidelines for biostimulants need thorough revision. Even though microorganisms and combinations are included in “biostimulants” definition, the category ‘Microbial Biostimulants’ is missing from the schedule. Thus, microorganisms and their consortia must be included as a category.
2. Although biopesticides that kill or directly affect pathogens do not qualify as biostimulants, the microbes or molecules that induce innate defence pathways to confer resistance in plants against pathogens /pests should also qualify as biostimulant.
3. Pooled data generated in collaboration by a group of companies/ industry association may be accepted by the Central Biostimulant Committee (CBC) for registration of biostimulants.
4. CBC must consider bio-efficacy data on biostimulants generated at SAUs/institutes, provided that the bioefficacy data has been generated following the previously notified guidelines, i.e. minimum three different doses for one season at three agro-ecological regions.
5. The toxicity data generated in good lab practices accredited labs for any scheduled biostimulants, or the data accepted by regulations for agricultural use in another OECD country should be accepted in India based on the Mutual Acceptance of Data system.
6. Toxicity data of a biostimulant if found safe and approved at a higher concentration, then it must be waived off for the same product at lower concentrations.
7. Shelf-life claim with storage data, generated under Accelerated Storage Stability studies must be accepted for registration of biostimulant.
8. Biostimulant formulations with combinations of two or more categories of substances listed in Schedule VI of Fertilizer Control Order 1985 may be permitted.
9. The Maximum permissible level (MPL) of Zinc (1500 ppm) and Copper (600 ppm) in the biostimulant formulations meant for foliar application has been recommended (Regulation (EU) 2019/1009).
10. Insecticide schedule contains chemicals that have dual function like Chitosan, brassinolides, blue-green algae extracts, vitamins, and growth regulators such as Gibberellins, IAA, 2-4D, cytokinin, and others, which also share biostimulant properties. These substances should be excluded from pesticide schedules and allowed to be used in biostimulants to their natural limits in plants when used as pesticides and biostimulants.

## **Brainstorming Session on “Greening of Livestock and Poultry Sectors: Policy Options for Developing Sustainable Approaches” (Convener: Dr. B.M. Naveena)**

The Academy organized a brainstorming session in hybrid mode on September 1, 2023 under the Chairmanship of Dr. Himanshu Pathak (President, NAAS). The following key recommendations emerged from the deliberations:



- Nutritional interventions required to induce changes in enteric fermentation characteristics of livestock to lower methane production. Feed ingredients and additives that can be used to inhibit methanogenesis need to be selected.
- Assessing environmental and economic impact of low producing animals and developing comprehensive model specific to each agro-economic zone.
- Harnessing renewable energy sources and developing technologies for valorization of waste (co-generation, bio-gas, zero-discharge technologies) representing new avenues of income and carbon credits facilitating climate financing.
- Low-carbon or zero-carbon labelling guidelines may be evolved for meat, dairy and poultry products with existing leads through policy dialogue with line departments like BIS, FSSAI, EIC, APEDA etc.
- Holistic institutional approach and cross-sectoral integration for enabling national policy framework ensuring greening of livestock and poultry sector while addressing all the SDG's.
- A network project may be initiated to estimate livestock's carbon footprint and quantifiable data generation through 'Lifecycle Assessment' by identifying respective ICAR Institutes and SAUs.

## **Brainstorming Session on “Prospects of dsRNA based Biopesticides for Crop Protection in Indian Agriculture” (Convener: Dr. B. Mandal)**

A brainstorming session in hybrid mode was organized on September 26, 2023, which was attended by more than 150 participants including experts and researchers from national and international Institutes.

During the discussion, the central theme revolved around devising the appropriate terminology for this technology differentiating from chemical pesticides. The session also delved into the prospects of expanding dsRNA production for field applications at a significantly reduced cost, and

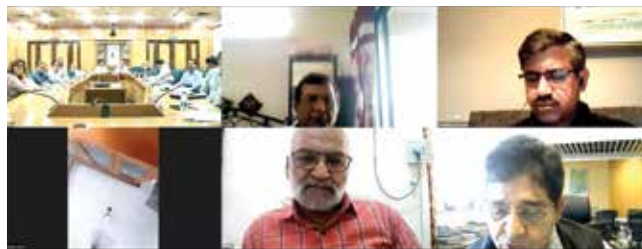


scrutinized the array of technological challenges that must be surmounted to enable its practical deployment in the field, including bolstering the efficient uptake and enduring stability of applied dsRNA within the plant system. Various delivery techniques, notably through nanoparticle and microbial carriers for creating a stable formulation that augments its stability and efficacy against the targeted pests must be evaluated for safety evaluation and risk assessment prior to its commercial release in the farmers' fields.

So far, the dsRNA work is centered around plant viruses in India, but there is great possibility of using it against other target pathogens, insects and weeds. It is necessary to establish biosafety norms and regulations to facilitate the usage of dsRNA technology as an alternative to chemical pesticides.

### **Brainstorming Session on “Multiple Uses of Solar Energy in Agriculture and Agro-Processing” (Convener: Dr. N.S.L. Srivastava)**

A BSS was organized in hybrid mode on October 5, 2023 under the Chairmanship of Dr. A.K. Singh (Vice President, NAAS). Based on the discussion on the use of solar energy for different purposes and modes in agricultural production, agro-processing and value addition of agro-products, it was observed that there was a need for standardizations of specifications, more research facilities for evaluation and testing and pilot scale demonstrations of these technologies for their large-scale adoption. The major recommendations from the deliberation were:



## Researchable issues

- R&D on agri-voltaic systems in many SAUs, ICAR institutes and other organisations clearly indicates that India has immense potential of the technology in agriculture. However, no definite recommendations are available about the spacing between rows of solar photo voltaic (PV) panels, height of installation of PV panels, arrangements of removing dust from PV panels etc. for different crops in different agro-climatic regions.
- The solar water pumping system is being popularized in agriculture sector on subsidy by the Govt. of India through different schemes. The status of working, water use efficiency and aftersales service of these system may be studied.
- Package of solar energy gadgets for different locations considering the need of agricultural production and location specific insolation may be finalized.
- The mobile PV power unit having foldable PV installation needs to be developed, demonstrated and popularized to operate different stationary agricultural machinery/gadgets for processing of farm produces in rural areas.
- Efforts have been made to develop thermal heat storage methods and material and their applications to drying, cold storage etc. However, more work needs to be done to develop efficient heat materials and methods.
- While working on solar drying, electricity generation and complete end-to-end value chain may be critically seen for economic benefits.
- Geothermal energy is categorized as clean and low cost energy. The application of geo-thermal energy for heating of green houses, aquaculture structures, poultry and animal shelter should be explored.
- The greenhouse agri-voltaic system is another potential area and needs to be investigated.

## Testing and Evaluation Issues

- There are number of solar energy-based equipment available in the market with varied specifications claiming different performance. The specifications need to be standardized along with performance evaluation parameters based on long duration trials.
- Although testing facility of the solar energy gadgets/ system is available at National Solar Energy Institute. However, more testing centres preferable under NARS should be established at centres of AICRP on EAAI (Energy for



Agriculture on Agro-based Industries) to evaluate the performance and to provide certification to equipments available in the market.

- There is a need to standardize the specifications of solar cold storage for different capacity.
- The solar drying is the most investigated area. Different types of drying systems are commercially available and sold through different modes including buy-back of dried products. These systems need to be properly tested and performance parameters should be optimized along with standardization of specifications.
- PV net-shed is emerging technology which may be tested and promoted in Indian conditions.

### **Promotional/Policy Issues**

- MNRE (Ministry of New and Renewable Energy) is engaged in the development and implementation of solar energy programmes and policy at national level. The effort should be made to develop a strong linkage to promote application of solar energy between MNRE and ICAR programme in agriculture.
- The solar water pumping system is mostly used as standalone system, so application of these systems should be augmented for other applications such as providing electricity to Agro-Processing Centres, charging stations and operating stationary agriculture machinery like threshers, sprayers, weeder etc.
- Agri-voltaic system connected with the grid and with proper layout configuration may be popularized and promoted at national level and brought under subsidy program. The sharing of profit to farmers through net metering should be ensured. The mechanism of solar panel insurance against theft need to be worked out.
- The large scale demonstration of solar cold storage system at farmers' fields/ mandies may be taken up to promote cold storage systems.
- Solar drying cum space heating systems may be promoted for drying of fruit and vegetables. The KVKs may be equipped with solar thermal systems for mass scale demonstrations, capacity building, awareness and popularization.
- The skill development programmes for solar green house and agri-voltaic technologies should be taken up for rural youth.

- A model solar based green house meeting all energy needs from solar energy should be demonstrated and promoted for high value crops.
- The large-scale demonstration of dryers having heat storage facilities should be taken up under PPP mode.

### **Brainstorming Session on “Restoration and Improvement of Soil Health” (Convener: Dr. B.S. Dwivedi; Co-convener: Dr. Anil K. Singh)**

A BSS on “Restoration and Improvement of Soil Health” was organized on October 28, 2023 under the Chairmanship of Dr. J.C. Katyal, former Vice President of the Academy.

Decline in the soil health and other natural resources is now considered as the most important second-generation problems of post-Green Revolution era, threatening sustenance of agricultural production. Restoration and enhancement of soil health assumes tremendous significance across the world, more so, in the developing countries due to ever-increasing population pressure on finite land resources. Key recommendations emerged out of the deliberation were:



- In most cases, soil health is expressed in terms of soil test values, thus the attention is largely on soil fertility. Inclusion of biological measurements is essentially required. A Centre for Soil Carbon Research is required at national level to guide the soil carbon research in the entire country.
- Improved understanding of the soil biological properties and behaviour of soil microbes under various soil-crop management practices is important for harnessing the potential of soil microbiome towards soil health management. Attempt should be made to establish the threshold levels of biological properties of soils in relation to the state of soil health. Feasibility of using microorganisms as sensitive indicator of the state of soil health should be assessed.
- Necessary policy initiatives are needed for tapping K from glauconite (green mica) deposits. Besides, due emphasis is to be laid on the use of alternate K sources viz, waste mica, K-enriched compost, crop residues, etc.

- The extent of soil and water pollution due to metal and metalloids, micro-plastics and organic pollutants in the country needs to be assessed. Risk assessment of pollutants being transferred to plants, animals and humans, and strategies for their effective management have to be worked out.
- The current soil health monitoring network has to be strengthened by inclusion of improved methodologies and modern tools such as hand-held devices and sensors. The mechanism for providing carbon credits and green credits to the farmers is to be developed.
- Long-term, multi-location experiments involving nutrient-water-tillage interactions have to be established for development/refinement of soil and cropping system-specific conservation agriculture technologies, and also to evaluate their impact on soil health and crop productivity.
- A robust Unified Soil Information System is needed under the thematic area of soils within the framework of National Geospatial Policy 2022.
- The Land Use Policy (2013) of India is not yet approved and adopted by the Government. A decade has elapsed since publication of the draft document. Subsequently, the Academy also developed a Soil and Land Use Policy and submitted to the Dept. of Agriculture & Farmers Welfare. These need to be appropriately integrated and formally adopted with due emphasis on delineating and protecting prime lands from the perspective of future food security and sustainability.

### **Brainstorming Session on “Smart Animal Farming: Perspective Planning Towards 5 Trillion Economy” (Convener: Dr. Y.S. Malik)**

A BSS on “Smart Animal Farming: Perspective Planning Towards a 5 Trillion Economy” was organized in hybrid mode on March 22, 2024. The programme was Chaired by Dr. Himanshu Pathak, (President, NAAS) and co-chaired by Dr. K.M. Bujarbaruah, (Vice-President, NAAS). Based on the discussion the major recommendations from the deliberation were:

- Encourage mechanization and automation in dairy farming to optimize input utilization and reduce costs. Transform selected dairy farms into precision dairy farms with advanced sensors and data analysis capabilities to evaluate new technologies.
- Foster collaboration among public sectors, private sectors, and farmers for successful implementation of smart animal farming strategies.



- Redirect research towards developing smart animal production technologies for smallholder farmers, aligned with national production system.
- Develop AI-based technologies to address challenges like mastitis, pregnancy diagnosis, and disease diagnostics.
- Encourage genomic selection and breed improvement, emphasizing value addition for sustainable breed utilization.
- Establish standardized practices for smart animal farming nationwide.
- Provide farmer education and training on smart animal farming practices.
- Develop comprehensive health coverage and vaccine production units for livestock, ensuring equitable access to veterinary healthcare services in rural areas.

## Expert Consultations

### Experts Consultation on “Clean Plant Programme” (Convener: Dr. V. K. Baranwal)

NAAS organized an expert consultation on “Clean Plant Programme (CPP)” in hybrid mode on April 3, 2023 under the Chairmanship of Dr. Himanshu Pathak (President, NAAS) to discuss the production of clean planting material for perennial and clonally propagated fruit crops including grape, apple, and citrus, where the demand for planting material is very high. More than 80 NAAS Fellows and experts from



ICAR Institutes, Agricultural/ Horticultural Universities, and private sector participated and provided their valuable inputs. The deliberations led to following recommendations:

- In view of the huge demands for planting materials of clonally propagated fruit crops and the high risk posed by the viruses, a Clean Plant Programme (CPP) is urgently needed.
- An apex body need to be established for smooth preparation of CPP through a National Centre for Clean Plant Programme (NCPP).
- Crop-wise Clean Plant Centers (CPC) may be established at ICAR Institutes or Agricultural/ Horticultural Universities which should have trained scientists in virology, and tissue culture, necessary laboratory set-up and required land for constructing Green Houses / net houses, if not existing.
- CPCs should provide clean planting stocks to certified nurseries for further maintenance, multiplication and distribution of plants to the growers.
- By making available sufficient quantities of planting material of fruit plants, this programme will help achieve higher income to farmers, higher foreign exchange through export and better quality to consumers.

### **Expert Consultation on “Ethics and Current State of Research Publication” (Convener: Dr. G. Taru Sharma)**

An expert consultation was organized under the Chairmanship of Dr. Himanshu Pathak (President, NAAS) in hybrid mode on August 31, 2023. In view of the fast-changing publishing landscape around the world, a relook into how the research findings are, published and communicated was needed. The following points emerged during the discussion:

- Existing guidelines available with the ICAR institutes and State Agricultural Universities on ethics in publication should be reviewed and necessary improvement or changes in the guidelines may be made after consultation with experts.



- Similarly ethical guidelines for publishers, journals, editors and reviewers may be developed.
- Journals which come for the NAAS ratings must be evaluated for their link with COPE and commitment from the chief editor/editor.
- Ethical parameters and publishing policies shall be included in all NAAS journals. Editors and editorial board members of peer reviewed Indian journals may be included in the committee while developing the scorecard for NAAS rating.
- Impact factor of the journal, which is used as an important evaluation parameter for recognition of author, career advancement or award/honours, cannot be overlooked, however, the societal impact of the publication addressing major national initiatives of the government should also be given due importance.
- The guidelines related to number of publications mandatory for Masters and Doctoral degree awards should be re-evaluated.
- In a multi-authored publication, authorship should accurately reflect the contribution of each author. It is unethical to accept or offer 'honorary' or 'gift' authorship based on someone's administrative/ scientifically higher position.
- Training programmes shall be conducted by ICAR-NAARM for scientists/ teachers regarding ethics in research publication. Similarly, Directors and Vice-Chancellors should be sensitized about the same during the Executive Development Programme.
- A separate budget should be allocated for the researchers through project funds (particularly extramural project) to submit their research work in peer-reviewed open access journals.
- Pre-print archives (arXiv, Researchsquare) may help in curbing 'idea plagiarism' that can happen in the process of conventional publication in peer-reviewed journals.
- The publishing standards of Indian journals can be improved by free e-subscription, time bound review/ publication process, diversity in editorial board.

### **Expert Consultation on “COP 28-Preparedness for Indian Agriculture” (Convener: Dr. P.K. Aggarwal)**

A consultation meeting of national experts was organized on September 25, 2023 under the Chairmanship of Dr. Himanshu Pathak (President NAAS) to provide

support from an agriculture perspective to India's negotiators for COP 28. Senior officers from the Ministry of Agriculture and Farmers Welfare, Ministry of Environment Forest and Climate Change, and Experts from different national and international organizations in India attended it. The main



objective of this discussion was to review the overall needs, strengths and weaknesses from an agricultural perspective to support potential discussion in COP around loss and damage, green carbon credits, and implications of government schemes on adaptation and mitigation. The following recommendations emerged from the detailed discussion:

1. It should be reiterated that India's emissions from the agriculture sector (livestock, fertilizers and rice paddies) are not luxury emissions but survival emissions and are necessary for the livelihood security of the medium and smallholding farming community. Also, India's per capita emissions are low compared to global standards.
2. Valuation of current government investments in agriculture from adaptation and mitigation angle needs to be highlighted at COP28 by the Indian negotiators.
3. India's Initiative and leadership in the solar and biofuel alliance and their contribution to reducing GHG emissions and building resilience in agriculture must be highlighted.
4. A massive amount of climate finance is required (the amount is unknown but is expected to be in trillions of dollars) to build the resilience of Indian farmers.
5. We should initiate activities to quickly estimate spatial and temporal losses and damage in the agriculture value chain, including infrastructure and trade in the current climate as well as in future scenarios. Estimates of climate finance required for adaptation linked to the above loss and damage estimates also need to be worked out. These estimates will help in submitting our response to Global Stock take.
6. A comprehensive estimate of the adaptation and mitigation potential and its realization arising out of investments being made through various central and

state government schemes should be made. These estimates will also help in submitting our response to Global Stock take.

7. Studies should be done to evaluate the relevance of the green credit scheme in agriculture for carbon credit generation to benefit farmers, considering the uncertainty of the green carbon market and complex issues related to monitoring, evaluation and verification of credits in agriculture systems at the farm scale.
8. A short course should be developed and offered to raise the capacity of government officials to understand the adaptation and mitigation aspects of their investment decisions and plans in the agriculture sector.

To strengthen our future stand and preparedness for future COPs, India should generate data on the aspects for which limited information are currently available.

### **Expert Consultation on “Digital Sequence Information for Agriculture” (Conveners: Prof. Rajeev K. Varshney and Prof. K. C. Bansal)**

An Expert Consultation on Digital Sequence Information (DSI) for agriculture in collaboration with the Centre for Crop & Food Innovation, Murdoch University, Perth, Australia and DivSeek International on March 26, 2024. The Expert Consultation attracted registration from >200 participants from 25 countries. The Consultation was Chaired by Dr. Himanshu Pathak (President, NAAS), and co-convened by



Prof. Rajeev K. Varshney, (Foreign Secretary, NAAS) and Prof. K. C. Bansal (former Secretary NAAS). The session was organized to discuss the following aspects:

- Understanding the scope and definition of DSI
- Importance of generation and storage of DSI
- Role of DSI in conservation and use of plant genetic resources for food and agriculture for R&D and crop improvement
- Issues related to access and use of DSI
- Resolving a common mechanism for the use of DSI, and fair and equitable benefit-sharing



## Strategy Workshops

### Strategy Workshop on “Food Safety Strategies for Indian Fisheries Sector” (Convener: Dr. G. Jeyasekaran)

A strategy workshop held in hybrid mode on May 17, 2023 under the Chairmanship of Dr. Himanshu Pathak (President, NAAS) deliberated on food safety issues



involved in aquatic foods with respect to microbial hazards, chemical hazards, authenticity/traceability, quality & safety management, role of WHO, FAO, UNEP & WAOH in aquatic food safety including one health plan, and the importance of education and research in implementing food safety

strategies in Indian fisheries sector. The following are the major recommendations and actionable points based on the deliberations:

- Creating technical manpower for dealing unique aquatic food safety issues through exclusive education and training on aquatic food safety
- Strengthening national aquatic food control systems as a part of National Policy
- Identification of aquatic food safety challenges along with response, and strengthening engagement with stakeholders & risk communication
- Improvement on the usage of aquatic food chain information, scientific evidence, risk assessment for making right risk management decisions on aquatic food integrity
- Promotion of aquatic food safety as a vital component in domestic marketing of aquatic foods
- Establishing an All India Network Project on Aquatic Food Safety by ICAR on the similar lines of Aquatic Animal Health, as it is a One Health Concept



- Implementation of Blockchain technology to improve traceability and transparency of aquatic food supply chains and to avoid aquatic food fraud
- Artificial Intelligence in aquatic food safety for risk prediction & monitoring
- Studying the food safety challenges on the emerging cell-based aquatic food products in India

### **Strategy Workshop on “Honey Bees: The Harbinger for Sweet Revolution (Convener: Dr. S.C. Dubey; ADG (PP&B); Co-Convener: Dr. Dr Pardeep Kumar Chhuneja, Dean, PAU))**

A Strategy Workshop was organized on September 29, 2023 in hybrid mode under the Chairmanship of Dr A.K. Singh (Vice President, NAAS). The following recommendations emerged from the detailed deliberations:

- A National level Apiculture Directorate/ Research Centre and State Apiculture Development Boards need to be established with specialized human resource
- Developing school curricula with topics on apiculture, training modules for skilling, and listing Apiculture as a subject at PG level.
- Creation of reliable database on number of beekeepers, honey bee colonies and honey production based on the information furnished by the concerned state agencies.
- Profiling of region- and crop-specific honey to be undertaken for GI tagging/branding.
- Research and development activities need to focus on indigenous spp. of honey bees and pollinators for stability and sustainability.
- Impetus needed to processing and value addition of all hive products and developing FSSAI standards for hive products of Indian niches.
- Insurance Regulatory and Development Authority of India (IRDAI-MoF), can facilitate in developing beekeeping friendly insurance policies.
- There must be evaluation of insecticides against honey bees for assessing its safety before their registration by the CIB&RC.
- Promoting and supporting manufacturing industry in scaling-up of fabrication of standard honey bee hives and other apicultural equipment.
- Facilitating capacity building and infrastructure for bee disease diagnosis at KVK level.

- Expansion of area under bee pasture by planting bee-friendly flowering trees in fallows.
- Central Warehouse Corporation to extend infrastructural facilities at field/ district/ state level for collection and storage of honey.
- NBB/ NDDDB/ APEDA/ State Agri. Export Corporation, etc. to create awareness about the benefits of honey and to support development of export system for new entrepreneurs.

## *Special Programmes*

### **Panel Discussions**

Two Panel Discussions were organized on the “Road Map for Indian Agricultural Research, Education and Extension for Amrit Kaal 2047” and “Empowering SAUs to Meet the Emerging Challenges in Agriculture” on June 04, 2023 under the Chairmanship of Dr. Himanshu Pathak (President, NAAS)

### **Panel Discussion on “Road Map for Indian Agricultural Research, Education and Extension for Amrit Kaal 2047” (Convener: Dr. P. K. Joshi)**

As envisioned by the Hon’ble Prime Minister for India to emerge as a developed Nation by 2047, when it celebrates its hundred years of independence, agricultural research, education and extension need to address future challenges supported by appropriate policies, to harness the opportunities in next twenty-five years. Based on the deliberations, it was proposed that the national agricultural research and education system should have flagship programs, such as, (1) characterization of available plant, animal, fish and microbes’ genetic stock; (2) harmonization of water-food-energy nexus ensuring integrity of ecosystem; (3) promotion of bio-circular economy in agriculture; (4) productivity enhancement through mechanization of agriculture and food system; (5) 3-D ocean farming; (6) improvement of genetic potential and animal health; (7) application of disruptive agricultural technologies; (8) sustainable approaches for Himalayan agriculture; (9) one-health-one-world approach; (10) sustainable and climate resilient agricultural systems; and (11) smart peri-urban agriculture.

To achieve the goals of Amrit Kaal in agriculture, it is essential to:

- Develop and prioritize clear goals and targets
- Allocate sufficient financial resources to high priority areas

- Develop state-of-the-art scientific research infrastructure
- Upgrade knowledge and skills of scientists to keep pace with rapidly changing developments
- Build multi-disciplinary and multi-institutional partnerships
- Collaborate with advance research and education institutions at national and global levels
- Reform agricultural education and agricultural extension system
- Adopt differentiated and disaggregated approach to develop improved technologies, and
- Bring policy reforms to effectively implement changing structure of agricultural research, education and extension system.

### Panel Discussion on “Empowering SAUs to Meet the Emerging Challenges in Agriculture” (Convener: Dr. K.M. Bujarbaruah)

To address the emerging challenges in agriculture, proper focus is needed on agricultural education to nurture and prepare science, industry, and society-ready students. SAUs/DUs and Central Agricultural Universities are at the forefront of agricultural knowledge dissemination, and it is crucial to empower them to meet the current and impending challenges. As the teachers will play a vital role in imparting education not only on subject knowledge, but also on the cognitive skills (critical thinking and problem-solving) and soft skills (social and emotional skills, cultural awareness, empathy, perseverance, teamwork, leadership), necessary pedagogic skills will also be required. The following recommendations emerged from the discussions:

- Aligning agricultural education with the National Education Policy



- Fostering inter-university collaboration
- Globalisation of educational Institutions
- Promoting public-private partnerships
- Additional support from ICAR
- Addressing autonomy and regulatory challenges with IAUA for the growth of agricultural universities.

## Virtual Workshop

**“Millets for Food and Nutrition Security: Celebrating International Year of Millets” (Convener: Prof. Rajeev K. Varshney; Co-convener: Prof. K.C. Bansal)**

The Academy organized a virtual workshop in collaboration with World Food Prize Foundation, on October 17, 2023 under the Chairmanship of Dr. Himanshu Pathak (President, NAAS). The presentations during the workshop highlighted the importance of millets research for increasing productivity and the need for large scale adoption of millets to address climate resilience, nutritional security and sustainable development of agriculture.



## Other Activities

### Pedagogy Development Programme: New Initiative

The Academy initiated a Pedagogy Development Programme (PDP) and so far more than 300 ICAR scientists have been benefitted through seven sessions. These training programs were designed to elevate the competencies of educators in effective teaching by integrating the participants. PDPs successfully addressed the evolving needs of teachers in the changing dynamics of education. It provided a platform for professional development, incorporating modern pedagogical techniques, technology integration, and fostering a learner-centered approach. The diverse range of topics and hands-on experiences ensured a comprehensive learning experience for the participants.



### Interaction meetings with Foreign and Pravasi Fellows for enhancing their contributions

Two virtual meetings were held with NAAS Foreign and Pravasi Fellows in the Academy on March 20, 2024, for Fellows from Australia, Asia, and Europe regions, and March 22, 2024, for Fellows from the North and South Americas regions. Both the meetings were Chaired by Dr. Himanshu Pathak (President, NAAS) and convened by Prof Rajeev K. Varshney (Foreign Secretary, NAAS).



Through these meetings, various avenues for support and guidance from Foreign and Pravasi Fellows, both individually or through their affiliated Professional Societies, towards the Academy's activities were identified. Some key areas identified for collaboration included:

- Collaboration of agricultural scientists from India with leading labs from abroad, especially in new/emerging areas of research, e.g. Artificial Intelligence.
- Fostering interactions between academies and organizing young scientist training programs on some specific topics related to Soil Science, Plant Science or Animal Sciences.
- Develop strategies to enhance teaching quality, shared degrees, and scientist and student exchange programs: The academy may facilitate the development of a structured program for the Education Division of ICAR through Foreign and Pravasi Fellows.
- Collaboration on writing briefing/policy papers, organizing expert consultations, and brainstorming sessions.
- Establishment of MoUs with organizations/ academies from abroad
- Collaboration of NAAS fostering South-South collaboration, particularly for Africa. Promotion of collaboration with Africa, by having more Fellows, and also organizing international conferences.
- Collaboration with Private Sector for commercialization and dissemination of technologies to benefit farmers.
- Develop a mechanism for agricultural research cooperation to promote joint publications and conferences.
- Facilitate India to take a leadership role in international meetings and to address the lack of Indian representation in global scientific journals.
- Collaboration between various institutions and countries including CGIAR and international organizations, particularly in the field of agriculture and food security.
- Organize regular interaction meetings to effectively harness new ideas.

### **NAAS – Industry/Investors Meet**

An Industry/Investors meet was organized on August 20, 2023 to open up collaboration and partnership with industry players in the areas of agricultural research and development. The meeting was Chaired by Dr. K. M. Bujarbaruah and Co-chaired

by Dr. A. K. Singh (Vice-Presidents, NAAS), where in 16 industries participated. After brief presentation on NAAS activities by the Secretary, the industry participants raised various issues of concern such as farm energy saving policy, ban on pesticides, digital agriculture, occupational



hazard mitigation, use of patented technologies etc. NABARD also participated and identified their area of collaboration and support means. Most of the industries expressed their willingness to support the Academy by becoming corporate fellows/ members or by providing research grants/ consultancy etc.

## Special Lecture

Prof. Fredy Altpeter (University of Florida, USA) delivered a special lecture on the topic “Towards Oilcane: Fueling the bioeconomy with metabolic engineering and gene editing of sugarcane”, on August 31, 2023.

## NAAS-PAAS Meeting: New Initiative

An interactive meeting of the Professional Association of Agricultural Societies (PAAS) was organized by the Academy in hybrid mode on September 26, 2023 under the Chairmanship of Dr. Himanshu Pathak (President, NAAS). Sixty five participants representing 48 Professional Societies joined the meeting. In his opening remarks, Dr. Pathak explained the purpose of the initiative, emphasizing the need for greater involvement of PAAS in NAAS activities and improvement in the quality of Society journals. The following areas were identified for the future course of actions:

- A common theme should be selected annually, and to bring it to fruition, all professional Societies and the Academy should collaboratively create a joint proposal for hosting 1-2 sessions or organizing joint conferences.
- One or two representatives from a few chosen Professional Societies will be invited to participate in the NAAS Executive Council meetings as invited members.





- The websites of different Societies can be interconnected with hyperlinks to facilitate the exchange and sharing of publications/documents.
- Societies can collaborate on joint publications, which may include books, policy papers, and other such documents.
- To enhance communication and the sharing of high-quality publications, the idea of forming a WhatsApp group was proposed. This group would consist of NAAS office bearers and 1-2 representatives from each professional Society.
- Professional Societies are strongly encouraged to propose innovative ideas for activities like BSS or Expert meetings and can engage with the Academy by sharing their suggestions. In support of this, the Academy will appoint one of its office bearers to oversee this activity and provide updates. Whenever any matter of national importance comes up, NAAS can be approached for assistance.
- The President proposed to have a discussion at the Academy with the Societies aimed at enhancing the quality of journals to attain higher NAAS ratings.
- The Academy will establish a committee comprising 5-6 members, including some of the NAAS Local Office Bearers and 2-3 representatives from other Societies, as identified by NAAS for follow-up actions.

## A National Dialogue on International Year of Millets-2023

The Academy organized a National dialogue on “Developing Roadmap for Promoting Millets for Sustainable Agriculture”, chaired by Dr. Himanshu Pathak, President (NAAS). The program included address by Dr. Himanshu Pathak followed by two panel discussions. The first Panel Discussion, led by Dr. A.K. Singh, (Director, IARI), focused on incentivizing millet-growing farmers and enhancing productivity. Dr. Singh emphasized the role of technology, market initiatives, and profitability in promoting millets. He also discussed mainstreaming millets into food systems, including mid-day meals and ready-to-eat/cook items. Dr. Singh shared a vision for India in 2047, highlighting the right to nutritious food and the eradication of hidden hunger.



The second Panel Discussion, led by Dr. Tara Satyavathi, (Director, ICAR-IIMR, Hyderabad), focused on diversifying the agri-food production system, addressing nutrition concerns, and exploring new markets for millets. She expressed her concern over one-third reduction in millet consumption over the past 20 years. To counter this trend she proposed a holistic approach involving culture, policies, markets, and technologies to enhance millet production and productivity. Emphasizing millets as a promising crop due to their gluten-free nature, she discussed strategies for enhancing productivity in stressed ecologies through optimal input supply and crop substitution. Dr. M.L. Jat, (Global Research Program Director, ICRISAT, Hyderabad) discussed strategies for making millets economically competitive, emphasizing the importance of enhancing productivity and identifying suitable domains for expansion. Prof. Balraj Singh, (Vice Chancellor, Sri Karan Narendra Agriculture University, Jobner) highlighted the need for interventions to develop millet varieties compatible with drought conditions and heat tolerance. Dr. B. Dayakar Rao, (CEO (Millets), ICAR-IIMR, Hyderabad) stressed the need to promote year-round consumption of millets. Dr. Israel Oliver King E.D, (Director – Biodiversity, MSSRF, Chennai) emphasized on the inclusion of Krishi Vigyan Kendras (KVKs) for farmer-centric work and advocated for the development of alternative seed systems.

## REGIONAL CHAPTERS

Regional Chapters organized the following events addressing food and nutritional issues of national and regional importance.

Chapters	Date
<b>Bengaluru Chapter</b>	
Organized an exposure visit for students from the Department of Biotechnology and Microbiology, East West First Grade College of Science, Bengaluru at ICAR-National Institute of Animal Nutrition and Physiology (NIANP), Bengaluru.	May 12, 2023
Organized Guest lecture “Agricultural Science for Higher Education and as Career Option” by Dr. Raghavendra Bhatta.	May 26, 2023
Translated NAAS Policy Papers 96 (Livestock Improvement through Artificial Insemination) and 103 (Antimicrobial Resistance) in Kannada language.	June 03, 2023
Organized Guest lecture “Transformational Agriculture: Livestock for Nutritional Sustainability” by Prof. Moti Lal Madana at ICAR-NIANP.	September 25, 2023
Organized Guest lecture “Career opportunities in Agriculture and allied Sciences” by Dr. K. Giridhar, (Principal Scientist, ICAR-NIANP).	December 05, 2023
<b>Bhopal Chapter</b>	
Celebrated Agriculture Education Day in collaboration with ICAR-Indian Institute of Soil Science.	December 04, 2023
Organized lecture on “Need for Soil and Water Management” by Dr. S.P. Datta, (Director, ICAR-IISS Bhopal).	
A March Past organized by the staff and students of ICAR- IISS, Bhopal, on World Soil Day.	December 05, 2023
<b>Coimbatore Chapter</b>	
A brainstorming session on “Sugarcane scenario: research and industry perspective”, at ICAR-Sugarcane Breeding Institute (SBI), Coimbatore.	May 10, 2023

Chapters	Date
An awareness programme on Natural resource conservation under Azadi ka Amrit Mahotsav.	May 26, 2023
An awareness programme in collaboration with ICAR-SBI, Coimbatore to manage a new phenomenon of combined incidence of crown mealy bug and Pokkah disease, affecting the sugarcane crop farmers from Sethiathope, TN.	June 30, 2023
A programme on Nutrition and Millet Entrepreneurship Awareness and Training Campaign.	July 07, 2023
A workshop on “Trends in the Application of Artificial Intelligence for Sustainable Agriculture” in association with ICAR- SBI, Coimbatore and National Academy of Biological Sciences, Chennai.	November 29, 2023
<b>Cuttack Chapter</b>	
Organized a BSS on “Utilization of industrial wastes for reclamation of acid soils: Waste to Wealth for promoting circular economy” at ICAR-NRRI, Cuttack.	October 10, 2023
Organized “World Soil Day”, 80 participants including farmers, farm women, scientists and students joined the programme.	December 05, 2023
<b>Hyderabad Chapter</b>	
An International Day for Biological Diversity on the theme “From Agreement to Action: Building Back Biodiversity”.	May 22, 2023
World Milk Day with the theme “Showcasing how dairy is reducing its environmental footprint, while also providing nutritious foods and livelihoods”.	June 01, 2023
Organized a special online lecture on “Challenges in Extending Symbiotic Nitrogen Fixation Beyond Current Host Range”.	August 10, 2023
A three-day Skill Development Training on “Integrated Farming System - Climate smart dryland technologies” at Agricultural Research Station, (ANGRAU), Anantapuramu, Andhra Pradesh for Farmers.	August 11-13, 2023

Chapters	Date
Skill Development Training Programme on Integrated Crop Management in Chilli for SC Farmers at SAIRD Krishi Vigyan Kendra (KVK), Gaddipally, Suryapet District of Telangana.	August 28-30, 2023
Organized a Policy Dialogue on 'Agricultural Education System in USA and Potential Collaboration with India' was organized.	September 07, 2023
National-level B-fest including the competition among students in the field of entrepreneurship development at ICAR-NAARM.	September 22-23, 2023
Organized women skill development training programme on "Value added Products with Millets" at SAIRD KVK, Gaddipally, Telangana.	October 07-12, 2023
Organized a skill development training programme on "Improved Crop Management Technologies and Value Addition of Millets" in collaboration with Krishi Vigyan Kendra (KVK), Amadalavalasa, Srikakulam District, Andhra Pradesh.	November 1-3, 2023
Kisan Diwas at Bopalle village of Telkapally Mandal, Nagarkurnool Distirct, Telangana.	December 23, 2023
Dr Rajeev K. Varshney, NAAS (Foreign Secretary) delivered a talk on the critical role of science communication in the research and development.	January 04, 2024
Organized an online meeting of the NAAS Associates of Hyderabad chapter.	January 24, 2024
Organized a special Lecture 'ASRB - In Search of Talent' By Dr. Sanjay Kumar, Chairman, Agricultural Scientists Recruitment Board (ASRB), New Delhi.	February 17, 2024
Organized two events of 'National Science Day (NSD)' on theme 'Indigenous Technology for Viksit Bahrat'.	February 28, 2024
<b>Karnal Chapter</b>	
Organized a BSS in association with ICAR-National Bureau of Animal Genetic Resources, Karnal.	May 30, 2023
Organized an expert consultation and developed an Advisory on strategies for managing land resources in post-flood scenario.	August 29, 2023

<b>Chapters</b>	<b>Date</b>
Organized a BSS to discuss land use and develop cropping recommendations in consultation with professional experts, state government officials, and other stakeholders.	September 06, 2023
<b>Kolkata Chapter</b>	
Organized a workshop on the occasion of the National Nutrition Week at the Ramkrishna Mission Ashram, Sargachi, Murshidabad.	Septemebr 12, 2023
<b>Lucknow Chapter</b>	
A stakeholder consultation in collaboration with ICAR-Indian Institute of Farming System Research (IIFSR), Modipuram, ICAR-IISR, Lucknow and TEEB for Agriculture and Food - Uttar Pradesh.	August 01, 2023
FPOs/ Farmers – Start-up Immersion cum AGRI UDAAN® 6.0, a Food & Agribusiness Accelerator Programme Road show in collaboration with ICAR-IISR, & ICAR-CISH, Lucknow.	August 08, 2023
Organized the ‘World Soil Day’ In collaboration with ICAR-Indian Institute of Sugarcane Research, Lucknow.	December 05, 2023
Organized an online lecture on ‘Artificial Intelligence for Sustainable Agriculture’ by Dr. P.V. Vara Prasad, Professor, & Director, Sustainable Intensification Innovation Laboratory, Kansas State University, USA	December 08, 2023
Organized a seminar on the “Mechanization of Sugarcane Cultivation” in collaboration with the ICAR-Indian Institute of Sugarcane Research (IISR), Lucknow, and the Sugar Technologists Association of India (STAI).	March 7, 2024
<b>Ludhiana Chapter</b>	
Organized an interactive workshop on ‘Speed Breeding’ with Punjab Agricultural University (PAU).	February 20, 2024.
<b>Pune Chapter</b>	
Organized a conference on “Generative AI in Practice for Empowering Agricultural Research Productivity” in online/virtual mode.	September 11-12, 2023

Chapters	Date
Organized a Lecture on 'Precision Breeding of Vitis for Improved Traits' by Dr. Sadanand A Dhekney, Professor, Department of Food and Agricultural Sciences, University of Maryland Eastern Shore.	January 24, 2024.
<b>Varanasi Chapter</b>	
Organized an awareness programme on climate change impact and agricultural education was organized at Nivedita Shiksha Sadan Balika Inter College, Tulsipur, Mahmoorganj, Varanasi.	December 29, 2023.

## *Activities of the Regional Chapters*

### **Bengaluru Chapter**

- An exposure visit was organized for 30 MSc students from the Department of Biotechnology and Microbiology, East West First Grade College of Science, Bengaluru at ICAR-National Institute of Animal Nutrition and Physiology (NIANP), and Bengaluru on May 12, 2023 and the scope of Agricultural Biotechnology and Microbiology for higher studies and career opportunities was explained to the students.
- NAAS Policy Papers 96 (Livestock Improvement through Artificial Insemination) and 103 (Antimicrobial Resistance) Kannada language were released and were released on June 03, 2023 at New Delhi during the meeting of the Conveners of the Regional Chapters.
- Guest lectures organised on:
  - (i) "Agricultural Science for Higher Education and as career option" for students of Standard School, Bangalore (Rural) on May 26, 2023.
  - (ii) "Transformational Agriculture: Livestock for Nutritional Sustainability" by Prof. Moti Lal Madan on September 25, 2023 at ICAR-NIANP.
  - (iii) "Career opportunities in Agriculture and allied Sciences" on December 05, 2023 for school students.
  - (iv) "Career opportunities in Agriculture and allied Sciences" by Dr. K. Giridhar, (Principal Scientist, ICAR-NIANP) for the students of Sri Ramakrishna Asharm, Shivanahalli at Bengaluru on December 05, 2023.

## Bhopal Chapter

### Interaction with school Students

Agriculture Education Day was celebrated in collaboration with ICAR-Indian Institute of Soil Science, Bhopal on December 04, 2023 to sensitize the school students (50) about the career prospects in Agriculture Science and to make them aware about the importance of natural resources for human survival and the need for conservation of these vital resources. A lecture on “Need for Soil and Water Management” was also delivered by Dr. S.P. Datta, (Director, ICAR-IISS Bhopal).

### World Soil Day

A massive March Past was organized by the staff and students of ICAR- IISS, Bhopal, on World Soil Day December 5, 2023 to spread awareness among the public on the importance of soil and water in human life. Dr. Anil K. Singh (Vice President, NAAS), while delivering the lecture, emphasized the importance of scientific use of water for higher productivity of soil.

## Coimbatore Chapter

- A brainstorming session on “Sugarcane scenario: research and industry perspective”, was held at ICAR-Sugarcane Breeding Institute (SBI), Coimbatore on 10.05.2023. Dr. T.R. Sharma, DDG (CS), ICAR stressed upon the development of climate resilient varieties having high water-use and nutrient-use efficiency and use of gene editing technology.
- An awareness programme on Natural resource conservation under Azadi ka Amrit Mahotsav was organised on May 26, 2023. A talk was delivered on ‘Reviving water bodies’ by Sh. R. Manikandan, Co-ordinator, Kovai Kulangal Pathukappu Amaippu & Jal Shakti Award winner, 2019.
- An awareness programme was organised on June 30, 2023 in collaboration with ICAR-SBI, Coimbatore to manage a new phenomenon of combined incidence of crown mealy bug and Pokkah disease, affecting the sugarcane crop farmers from Sethiathope, TN.
- A programme on Nutrition and Millet Entrepreneurship Awareness and Training Campaign was organized on July 07, 2023.
- A workshop on “Trends in the Application of Artificial Intelligence for Sustainable Agriculture” was organized in association with ICAR- SBI,



Coimbatore and National Academy of Biological Sciences, Chennai, in hybrid mode on November 29, 2023. The participants were from both public institutions and private sector.

## Cuttack Chapter

- Organized a BSS on “Utilization of industrial wastes for reclamation of acid soils: Waste to Wealth for promoting circular economy” at ICAR-NRRI, Cuttack on October 10, 2023. The participants from ICAR, Industry, Krishi Vigyan Kendras, Startups, Farmers Producers Organization and State department officials from Govt. of Odisha, were benefitted.
- Organized “World Soil Day” on December 05, 2023 and 80 participants including farmers, farm women, scientists and students joined the programme.

## Hyderabad Chapter

- An International Day for Biological Diversity on the theme “From Agreement to Action: Building Back Biodiversity” was celebrated on 22nd May, 2023. An Online lecture on ‘Silk Diversity Conservation for Socioeconomic Sustainability of Poor Farmers’ was delivered by Dr. N.K. Krishna Kumar, Former DDG (Hort.), ICAR
- World Milk Day was celebrated with the theme “Showcasing how dairy is reducing its environmental footprint, while also providing nutritious foods and livelihoods” on 1st June, 2023. An Online lecture on ‘Global Food Security: Role of Milk and Milk Products’ was delivered by Dr. Dheer Singh, Director & Vice Chancellor, ICAR-National Dairy Research Institute, Karnal
- A special online lecture on “Challenges in Extending Symbiotic Nitrogen Fixation Beyond Current Host Range” by Dr. Maitrayee Das Gupta, Professor, University of Kolkata was organised on 10 August, 2023.



- A three-day Skill Development Training on “Integrated Farming System - Climate smart dryland technologies” was organized at Agricultural Research Station, (ANGRAU), Anantapuramu, Andhra Pradesh for Farmers from 11-13th August 2023. A sensitization programme was also organised for B.Sc. (Agriculture) Students on the opportunities for higher education in agriculture sector, nutrition sensitivity and climate change issues.
- Skill Development Training Programme on Integrated Crop Management in Chilli for SC Farmers was organized at SAIRD Krishi Vigyan Kendra (KVK), Gaddipally, Suryapet District of Telangana during 28-30 August, 2023.
- Organized a Policy Dialogue on ‘Agricultural Education System in USA and Potential Collaboration with India’ was organized on 7th September, 2023 in hybrid mode.
- The Sankalp 8.0, the national-level B-fest including the competition among students in the field of entrepreneurship development was organized at ICAR-NAARM during 22nd and 23rd, September, 2023. The event received impressive response with over 9300 registrations from more than 1000 institutions, culminating in 200+ finalists in eight distinct events.
- Women skill development training programme on “Value added Products with Millets” was organized on the eve of International Year of Millets 2023 for women members at SAIRD KVK, Gaddipally, Telangana from October 7-12, 2023.
- A skill development training programme was organized on “Improved Crop Management Technologies and Value Addition of Millets” for the farmers of Srikakulam District from November 1-3, 2023 in collaboration with Krishi Vigyan Kendra (KVK), Amadalavalasa, Srikakulam District, Andhra Pradesh.
- Kisan Diwas was celebrated at Bopalle village of Telkapally Mandal, Nagarkurnool Distirct, Telangana on December 23, 2023 on the theme “Cultivating the Future: Innovation and Sustainability in Agriculture” with the support of Gram Sarpanch.
- Dr Rajeev K. Varshney, NAAS Foreign Secretary, spoke on the critical role of science communication in the research and development. on January 4, 2024 at IIMR, Rajendranagar, Hyderabad. He was also felicitated for getting the coveted Fellow of Royal Society.
- The online meeting of the NAAS Associates of Hyderabad chapter was held on January 24, 2024. The meeting was convened with an objective of strengthening the NAAS in general and NAAS-Regional Chapter Hyderabad in particular.

## Special Lecture on “ASRB - In Search of Talent”

Dr. Sanjay Kumar, Chairman, Agricultural Scientists Recruitment Board (ASRB), New Delhi delivered a special lecture on ‘ASRB - In Search of Talent’ on February 17, 2024 in hybrid mode



## National Science Day Celebrations

In collaboration with ICAR-NAARM, Hyderabad and ICAR - Indian Institute of Rice Research (IISR) two events of ‘National Science Day (NSD)’ was organized on February 28, 2024. The theme of this year NSD was ‘Indigenous Technology for Viksit Bharat’. Prizes and certificates to the winning students and mementos to the participating schools were presented.



## Karnal Chapter

- Organized in association with ICAR-National Bureau of Animal Genetic Resources, Karnal a special Brain Storming Session on May 30, 2023.
- Organized an expert consultation on August 29, 2023 and developed an Advisory on strategies for managing land resources in post-flood scenario.
- Organized another brainstorming session on September 6, 2023 to discuss land use and develop cropping recommendations in consultation with professional experts, state government officials, and other stakeholders.

## Kolkata Chapter

- Organized a workshop on the occasion of the National Nutrition Week at the Ramkrishna Mission Ashram, Sargachi, Murshidabad on September 12, 2023 to empower the students regarding balanced nutrition and how to achieve it with simple food stuffs available at their home. About 450 students from two local schools were benefitted.
- Organized 'SAVE SOIL' campaign on October 17, 2023 to create awareness among students at the Jiaganj Raja Bijoy Singh Vidyamandir, Jiaganj.

## Lucknow Chapter

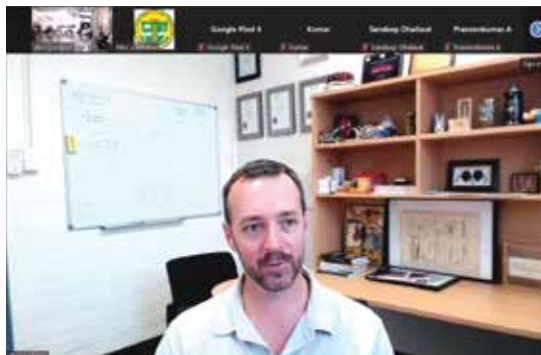
- A stakeholder consultation was organized in collaboration with ICAR-Indian Institute of Farming System Research (IIFSR), Modipuram, ICAR-IISR, Lucknow and TEEB for Agriculture and Food - Uttar Pradesh: on 1st August, 2023 Dr. Salman Hussain, Head, Economics of Nature Unit and Coordinator TEEB, UNEP delivered Keynote address as Chief Guest (Virtual).
- FPOs/ Farmers – Start-up Immersion cum AGRI UDAAN® 6.0, a Food & Agribusiness Accelerator Programme Road show was organized at Lucknow in collaboration with ICAR-IISR, & ICAR-CISH, Lucknow on 08th August 2023.
- In collaboration with ICAR-Indian Institute of Sugarcane Research, Lucknow the 'World Soil Day' was organized on December 5, 2023. Dr. K.N. Tiwari (consultant IFFCO), delivered a talk on the occasion as the Chief Guest.
- An online lecture on Artificial Intelligence for Sustainable Agriculture by Dr. P.V. Vara Prasad, Distinguished Professor, & Director- Sustainable Intensification Innovation Laboratory, Kansas State University, USA was organized on December 8, 2023.



- In collaboration with the ICAR-Indian Institute of Sugarcane Research (IISR), Lucknow, and the Sugar Technologists Association of India (STAI) an All-India National Seminar was organized on the “Mechanization of Sugarcane Cultivation” on March 7, 2024. More than 200 experts including scientists, technocrats, farmers and industry representatives participated. Shri Sanjay Singh Gangwar (Member, Uttar Pradesh Assembly) was the chief guest and he stressed the importance of mechanization and modernization in empowering sugarcane farmers, essential for India’s journey towards development.

### Ludhiana Chapter

- Organized an interactive workshop on ‘Speed Breeding’ with Punjab Agricultural University (PAU) on February 20, 2024. Dr. A.S. Dhatt, (Additional Director of Research, PAU) Chaired the event, featuring Prof. Lee Hickey from the University of Queensland, Australia, as the guest speaker. Prof. Hickey advocated for speed breeding to enhance crop breeding programs, stressing protocol development and integration with genomic techniques.



### Pune Chapter

Organized in collaboration with ICAR-NRC Grapes, Pune and Society for Advancement of Viticulture and Enology. (1) National Conference on “Generative AI in Practice for Empowering Agricultural Research Productivity” in online/virtual mode on September 11-12, 2023; and (2) Lecture on ‘Precision Breeding of Vitis for Improved Traits’ by Dr. Sadanand A Dhekney, Professor, Department of Food and Agricultural Sciences, University of Maryland Eastern Shore in hybrid mode on January 24, 2024.

## Varanasi Chapter

- In collaboration with ICAR-Indian Institute of Vegetable Research, a one day 'Awareness Programme on Advances in Agricultural Sciences' was conducted at Shri Krishna Intermediate College, Bahoranpur, Babhniav, Varanasi to inform about the scope of Agriculture education, develop scientific insights in agriculture, and spread awareness about the importance of vegetables in our daily diet.
- An awareness programme on climate change impact and agricultural education was organized at Nivedita Shiksha Sadan Balika Inter College, Tulsipur, Mahmooorganj, Varanasi on December 29, 2023. An essay competition on "Impact of climate change on daily life" along with planting of guava was also held. About 1100 girl students were benefitted from the programme.

## LINKAGES

### *National*

The Academy implements most of its programmes through the ICAR Institutes, State Agricultural Universities, and other research organizations/NGOs with whom it has strong linkages. These linkages are nurtured and strengthened by its Fellows working in these organizations. The Academy also joined the initiative to establish linkages among the Science Academies of India, such as the Indian National Science Academy (INSA); Indian Academy of Sciences, India; Indian National Academy of Engineering; National Academy of Sciences, Allahabad; and National Academy of Medical Sciences, to address issues concerning (a) better public understanding of science in the country, and (b) identification of frontline issues facing the country in which science and scientists have a stake.

### *International*

The Academy collaborated with the World Food Prize Foundation and a virtual workshop entitled 'Millets for Food and Nutrition Security: Celebrating International Year of Millets' was jointly organized on October 17, 2023.

The Academy organized two interaction meetings with the Foreign and Pravasi Fellows on March 20, 2024 and March 22, 2024 to enhance their involvement in the Academy and harness their experience and expertise for strengthening Academy's activities.

## *Institutional Membership*

The Institutions, which are involved in activities aligned to the objectives of the Academy, are eligible to become an Institutional Member of the Academy by contributing Rs 10 lakh towards the NAAS Corpus Fund for its sustained long-term support of different activities. As on March 31, 2024, 38 Institutional Members have been inducted.

## **RECOGNISING EXCELLENCE**

### *New Fellowship*

#### **Section I: Crop Sciences**

##### **Dr. Aditya Pratap**

Principal Scientist, Crop Improvement Division, ICAR-Indian Institute of Pulses Research, Kalyanpur, Kanpur, U.P.

##### **Dr. S.L. Krishnamurthy**

Senior Scientist (Plant Breeding), Division of Crop Improvement, ICAR-Central Soil Salinity Research Institute, Karnal, Haryana

##### **Dr. Maganti Sheshu Madhav**

Director, ICAR-Central Tobacco Research Institute, Bhaskar Nagar, Rajahmundry, A.P.

##### **Dr. Gyan Prakash Mishra**

Head, Division of Seed Science and Technology, ICAR-Indian Agricultural Research Institute, New Delhi

##### **Dr. Tapan Kumar Mondal**

Principal Scientist, ICAR-National Inst. for Plant Biotechnology, Pusa, New Delhi

##### **Dr. Mulpuri Sujatha**

Principal Scientist, ICAR-Indian Institute of Oilseeds Research, Rajendranagar, Hyderabad, A.P.

#### **Section II: Horticultural Sciences**

##### **Dr. Suresh Kumar Paramasivam**

Principal Scientist, ICAR-National Research Centre for Banana, Tiruchirappalli, Tamil Nadu

##### **Dr. Rajesh Kumar**

Principal Scientist, Division of Vegetable Improvement, ICAR-Indian Institute of Vegetable Research, PO Jakhini (Sahahanshpur), Varanasi, U.P.

##### **Dr. Rakesh Singh**

Principal Scientist, E-203, Division of Genomic Resources, ICAR-National Bureau of Plant Genetic Resources, New Delhi

### Section III: Animal Sciences

#### **Dr. Yashpal Singh Malik**

Dean, College of Animal Biotechnology, GADVASU, Ludhiana, Punjab

#### **Dr. Bimlesh Mann**

Assistant Director General, Education Division, Indian Council of Agricultural Sciences, KAB II, New Delhi

#### **Dr. Narayana H. Mohan**

Principal Scientist, ICAR-National Research Centre on Pig, Rani, Guwahati, Assam

#### **Prof. Ashok Kumar Mohanty**

Joint Director, ICAR-Indian Veterinary Research Institute, Mukteswar Campus, Dist: Nainital, Uttarakhand

### Section IV: Fisheries Sciences

#### **Dr. Bijay Kumar Behera**

Dean, College of Fisheries, Rani Lakshmi Bai Central Agricultural University, Jhansi, U.P.

#### **Dr. Uttam Kumar Sarkar**

Director, ICAR-National Bureau of Fish Genetic Resources, Lucknow, U.P.

### Section V: Natural Resources Management

#### **Dr. Sanjib Kumar Behera**

Principal Scientist, ICAR-Indian Institute of Soil Science, Nabibagh, Bhopal, M.P.

#### **Dr. Puja Khare**

Principal Scientist, Crop Production and Protection Division, CSIR-Central Institute of Medicinal and Aromatic Plants, Lucknow, U.P.

#### **Dr. Sunil Kumar**

Director, ICAR-Indian Institute of Farming Systems Research, Modipuram, Meerut, U.P.

#### **Dr. Rajiv Arvind Marathe**

Director, ICAR-National Research Centre on Pomegranate, Kegaon, Solapur, Maharashtra

#### **Dr. Sanjay Singh Rathore**

Principal Scientist, Division of Agronomy, ICAR-Indian Agricultural Research Institute, New Delhi

### Section VI: Plant Protection Sciences

#### **Dr. Dnyaneshwar Madhukar Firake**

Senior Scientist (Agricultural Entomology), ICAR Directorate of Floricultural Research, Keshavnagar, Pune, Maharashtra

#### **Dr. Thangavelu Raman**

Principal Scientist, ICAR-NRC for Banana, Tiruchirappalli, Tamil Nadu

#### **Dr. Amalraj Ramesh Sundar**

Principal Scientist, Plant Pathology Section, Division of Crop Protection, ICAR-Sugarcane Breeding Institute, Coimbatore, Tamil Nadu



**Prof. Birinchi Kumar Sarma**

Professor, Department of Mycology and Plant Pathology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, U.P.

**Section VII: Agricultural Engineering & Technology**

**Prof. Chandranath Chatterjee**

Professor, Agricultural and Food Engineering Department, Indian Institute of Technology Kharagpur, West Medinipur, W.B.

**Dr. M.R. Manikantan**

Principal Scientist, PB&PHT Division, ICAR-Central Plantation Crops Research Institute, Kasaragod, Kerala

**Section VIII: Social Sciences**

**Dr. Mridula Devi**

Director, ICAR-Central Institute for Women in Agriculture, Bhubaneswar, Odisha

**Dr. Girish Kumar Jha**

Principal Scientist, Division of Agricultural Economics, ICAR-Indian Agricultural Research Institute, New Delhi

**Dr. Prabina Kumar Meher**

Senior Scientist, ICAR-Indian Agricultural Statistics Research Institute, Library Avenue, New Delhi

**Foreign Fellows**

**Dr. Takashi Yamano**

Principal Economist, Asian Development Bank, Mandaluyong City, 1550 Metro Manila, Philippines

**Pravasi Fellows**

**Prof. P.V. Vara Prasad**

Distinguished Professor, Kansas State University, Manhattan, USA

**Dr. Harbans Singh Bariana**

Adjunct Professor, School of Sciences, Western Sydney University, Australia

**Dr. Shiv Om Prasher**

Distinguished James McGill Professor, Department of Bioresource Engineering, Macdonald Campus of McGill University, Canada

**Associateship**

**Section I: Crop Sciences**

**Dr. Haritha Bollinedi**

Scientist - Senior Scale, Division of Genetics, Indian Agricultural Research Institute, Pusa Campus, New Delhi

**Dr. Rajkumar Uttamrao Zunjare**

Scientist - Senior Scale, Maize Genetics Unit, Division of Genetics, ICAR-Indian Agricultural Research Institute, New Delhi

## Section II: Horticultural Sciences

### Dr. Tanuja Buckseth

Scientist - Senior Scale, Division of Crop Improvement and Seed Technology, ICAR-Central Potato Research Institute, Shimla, H.P.

## Section III: Animal Sciences

### Dr. A. Arun Prince Milton

Scientist - Senior Scale, Division of Animal and Fisheries Sciences, ICAR Research Complex for NEH Region, Umiam, Meghalaya

### Dr. Jess Vergis

Assistant Professor, Department of Veterinary Public Health, College of Veterinary and Animal Sciences, Pookode, Lakkidi P.O., Wayanad, Kerala

## Section IV: Fisheries Sciences

### Dr. Ferosekhan S

Scientist - Senior Scale, Aquaculture Production and Environment Division, ICAR-Central Institute of Freshwater Aquaculture, Kausalyaganga, Bhubaneswar, Odisha

## Section V: Natural Resources Management

### Dr. Vijay Pooniya

Senior Scientist, Division of Agronomy, ICAR-Indian Agricultural Research Institute, New Delhi

### Dr. Ashim Datta

Senior Scientist, Division of Soil and Crop Management, ICAR-Central Soil Salinity Research Institute, Karnal, Haryana

## Section VI: Plant Protection Sciences

### Dr. Totan Adak

Senior Scientist, Crop Protection Division, ICAR-National Rice Research Institute, Cuttack, Odisha

### Dr. Susheel Kumar Sharma

Scientist, Advanced Centre for Plant Virology, Division of Plant Pathology, ICAR-Indian Agricultural Research Institute, New Delhi

## Section VII: Agricultural Engineering & Technology

### Dr. Santanu Basak

Senior Scientist, Chemical & Bio-chemical Processing Division, ICAR-National Institute of Natural Fibre Engineering and Technology, Kolkata, W.B.

## Section VIII: Social Sciences

### Dr. Suresh Kumar

Senior Scientist, ICAR-Central Soil Salinity Research Institute, Karnal

## *Young Scientist Awards for 2024*

Name of the Award	Name of the Awardee
Crop Sciences	Dr. Kuldeep Tripathi
Horticultural Sciences	Dr. Manjunatha Gowda D C
Fisheries Sciences	Dr. Arisekar U
Natural Resources Management	Dr. Chaitanya Prasad Nath
Plant Protection Sciences	Dr. Rahul Kumar Tiwari
Agricultural Engineering & Technology	Dr. Adinath Eknath Kate
Social Sciences	Dr. Neeraj Budhlakoti

## **FOUNDATION DAY AND ANNUAL GENERAL MEETING**

### *Foundation Day Celebration*

The Foundation Day lecture was delivered by Shri B.V.R. Subrahmanyam, (IAS) Chief Executive Officer NITI Aayog, on June 5, 2023. During his lecture, he shed light on India's remarkable achievements in the field of agriculture and emphasized how these advancements can pave the way for India's transformation into a Global Leader in agriculture. Shri Subrahmanyam presented compelling data indicating that India has the potential to feed half of the world's population, and highlighted the significance of the agricultural sector for the nation's prosperity. Shri Subrahmanyam also addressed the challenges that lie ahead, stressing upon the importance of tackling issues such as fisheries and animal farming. He pointed out that these areas require special attention and innovative solutions for better returns. Further, he emphasized the need for a dynamic system of research in the agricultural sector, elucidating the significance of continuous innovation and



adaptation to overcome the challenges faced by the industry. His lecture provided a holistic view with valuable insights into India's agricultural achievements, its potential as a global leader in food production, and the steps needed to ensure sustainable growth in the sector.

Prof. Ramesh Chand, a distinguished member of NITI Aayog, and the Chief Guest, shared valuable insights on the role of agriculture in achieving the goal of Viksit Bharat (Developed India). He highlighted the need for sustainable methods, more productivity, and better market access to fulfil the rising demand for organic products. Prof. Chand acknowledged the need for a balance between technological progress and job creation. He emphasized the importance of nurturing manufacturing sectors that can provide quality employment opportunities while leveraging technology to enhance productivity and competitiveness.



### *Presidential Address*

Dr. Himanshu Pathak, President, NAAS and Secretary, DARE & DG, ICAR in his address to the Fellowship, emphasized the challenges before the Academy and the



need to relook its programmes in 2023 to address the current issues. He suggested that the Academy may focus on identifying a specific theme with a special relevance each year, such as the opportunities and challenges in mainstreaming millets as the theme in the Year 2023, and organize one big event to deliberate on the theme

holistically. He also expressed the need to organise the Agricultural Science Congress annually, instead of bi-annually. The Academy should reorient its activities to make

publications on current issues more frequent, and bring out a concise publication on the “State of Indian Agriculture” to be released on January 1st every year. He further emphasised on fostering close linkages and active collaboration with other scientific journals and scientific academies for quality publications.

Similarly, the association between the NAAS and PAAS need to be enhanced, and the academy should attract and encourage more students through fellowships, internships, and visits to advanced laboratories. It is desired that the academy increases its engagements with print, social, and electronic media of repute, to convey important science backed ideas, concepts and policy inputs to the wider community. Brainstorming sessions should be held to encourage participation from a wider audience, including teachers, industry partners and other stakeholders.

The Academy needs to promote most activities, correspondence and publications through online processing to save time and resources and to make the system more efficient, including journal ratings. He also recommended the use of social media to improve communication and promote transparency within the esteemed scientific community. The President invited suggestions from the esteemed Fellowship for generating resources to strengthen the Academy and improve its function further.

### *Excerpts from the Minutes of the 30th AGM*

The 30th Annual General Body Meeting of the Academy was organized in hybrid mode under the chairmanship of the President Dr. Himanshu Pathak, on June 5, 2023 at 9.30 a.m.

At the outset, a moment of silence was observed in remembrance of nine esteemed Fellows of NAAS, Dr. Yogendra Alagh, Dr. Chitranjan Bhatia, Dr. Devkinandan Kamra, Dr. Ajay Kumar Paridha, Dr. Nipendrakumar Roy, Dr. Rajendra Nath Sahaney, Dr. B.N. Singh, Dr. Keerti Singh, and Dr. D.P. Ray who left this world since the last GB.

Dr. W.S. Lakra, Secretary then welcomed the President, Dr. Himanshu Pathak, the Immediate-Past President, Dr. T. Mohapatra, all Office Bearers and EC members, as well as all the esteemed Fellows who were attending the AGM. Dr. Himanshu Pathak, President of the Academy, also extended a warm welcome to all the esteemed Fellows present at the Annual General Body meeting as well as the newly elected Fellows and Associates.

Thereafter the agenda as listed, were taken up by the Secretary, Prof. K. C. Bansal, who mentioned that the Academy organized all the scheduled meetings

and committed activities during the year, which included 11 Brainstorming Sessions, and several strategy workshops, consultation meetings and round table discussions. He also informed that in 2022, 34 new Fellows, including 2 Foreign Fellows and 3 Pravasi Fellows, were inducted and 10 Associates were selected, bringing the total number of Fellows to 760 and total number of Associates to 114 as on 1st January 2023.

The GB was informed that the Academy published 4 strategy papers (No. 15 to 18), 14 Policy Papers (No. 107 to 120) and 2 Policy Briefs (No. 12 & 13) and 4 issues of the NAAS News during the year. All 4 numbers of NAAS Official Journal 'Agricultural Research' were printed in time with the help of Springer India Pvt. Ltd. As decided in the EC meeting, two panel discussions were held, in place of presentations by the newly-elected Fellows, on June 4, 2023 on the topics of "Roadmap for Agricultural Research, Education and Extension for Amrit Kaal -2047" and "Empowering Agricultural Universities to meet the emerging challenges in Agriculture". This year's Foundation Day Lecture was delivered by Shri B.V.R. Subrahmanyam, IAS, Chief Executive Officer, NITI Aayog and addressed by the Chief guest Prof. Ramesh Chand, Hon'ble Member, NITI Aayog.

Two meetings with Foreign and Pravasi Fellows were held on July 1, and July 5, 2022. On May 22, 2022, a session titled "Global Genebanks and Biodiversity Management for Sustainable Agriculture" was held to commemorate International Biodiversity Day, and a special lecture by Mr Kent Nnadozie, Secretary of the International Treaty, FAO, Rome on "The International Governance of Plant Genetic Resources for Food and Agriculture: The Role and Place of the International Plant Treaty" was organized on Sept 15, 2022.

The newly elected Fellows and Associates were admitted to the Academy, and Young Scientist Awards were presented. Thereafter, Padma Awardee Fellows, Dr. Arvind Kumar, Dr. Bakshi Ram, and Dr. M.V. Gupta; two outstanding farmers, Sh. Sultan Singh and Sh. Bharat Bhushan Tyagi; two distinguished industry representatives, Sh. Raju Barwale and Dr. M. Ramasami; two notable media persons, Sh. Harish Damodaran and Dr. O.P. Yadav; and three NAAS Fellows, Prof. Rajeev K. Varshney, Dr. Abdelbaki M. Ismail and Dr. Uma Shankar Singh; who received very high international recognitions, were felicitated.

The XVI Agricultural Science Congress is scheduled to be held from Oct 10-13, 2023 at ICAR-Central Marine Fisheries Research Institute, Kochi. The theme of the Congress is 'Transformation of Agri- Food Systems for Achieving Sustainable Development Goals'. The Fellowship was invited to join the Congress.

## *Admission of the Fellows and Associates*

Dr. W.S. Lakra, Secretary conducted the formal admission ceremony of the newly elected Fellowship and Associateship during the year 2023. Respective Conveners of the Sectional Committees read out the citations of the Fellows. Thereafter, the President admitted them to the Fellowship of the Academy and presented the certificates under different sections.

## **XVI AGRICULTURAL SCIENCE CONGRESS**

The Academy organized XVI ASC on “Transforming Agri-Food Systems for Sustainable Development Goals”, in collaboration with Central Marine Fisheries Research Institute (CMFRI) Kochi, India, from October 10-13, 2023. Bringing together more than 1,600 delegates from across India and abroad, the Congress provided a vibrant platform for experts, researchers, farmers, policymakers, and industry leaders to engage in meaningful dialogue and explore innovative solutions to address the pressing challenges facing the agricultural sector.



Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry and Dairying, Govt. of India, inaugurated the XVI ASC. He emphasized that there is an urgent need to transform agri-food systems into sustainable enterprises through

scientific innovations, in view of the increasing food demand, environmental degradation and the challenges posed by climate change. He further added that the future of India's agriculture depends a lot on how the accumulated scientific knowledge can be translated to commercial success.

Dr. Himanshu Pathak, Secretary to the Department of Agricultural Research and Education (DARE) and the Director General of the Indian Council of Agricultural Research (ICAR) delivered the Presidential address. Dr. Pathak read out Prime Minister Narendra Modi's message highlighting on living in harmony with nature, ending hunger and achieving productivity growth through chalking out a futuristic blue print to meet the sustainable development goals. He further estimated that India's food grain demand will rise to 340-355 metric tonnes by 2033. Research on genomics and genome editing would be the core focus for technological breakthroughs in agriculture and commodities where traditional breeding cannot yield the desired results.

Some important outcomes of the deliberations during the ASC are listed below:

**Promote Dietary Diversity and Nutrition Literacy:** Encourage individuals to diversify their diets by including a wider range of foods such as pulses, fruits, vegetables, and animal-based products. Additionally, invest in educational initiatives to increase nutrition literacy, ensuring people understand the importance of consuming a balanced diet for optimal health.

**Utilize Traditional Food Processing Methods:** Emphasize the importance of traditional food processing techniques in preserving nutrients and phyto-chemicals in plant-based foods. By reducing anti-nutrients through these methods, the nutritional value of food can be enhanced, contributing to improved nutrition security.

**Empower Youth in Agriculture:** Provide opportunities and incentives to young people to engage in agriculture, linking their participation to national nutrition missions. By empowering youth to pursue careers in agriculture, interdisciplinary approaches can be utilized to address issues such as hidden hunger and food insecurity.

**Invest in Advanced Biotechnologies:** Allocate resources towards research and development of advanced biotechnologies like CRISPR-Cas genome editing. These technologies offer potential solutions for improving crop traits, increasing yield, and addressing agricultural challenges in a sustainable manner.



**Focus on Livestock and Poultry Nutrition:** Establish national missions focused on feed and fodder security to enhance the nutritional quality of livestock and poultry products. By prioritizing nutrition in animal husbandry practices, the availability of high-quality protein sources can be increased, contributing to improved food security.

**Prioritize Horticultural Innovation:** Place emphasis on horticultural crops in efforts to transform food systems towards sustainability. By promoting innovation in horticulture, including the adoption of modern technologies for production and post-harvest management, the availability of nutritious fruits and vegetables can be increased.

**Implement Water and Soil Management Strategies:** Develop and implement strategies for sustainable water and soil management in agriculture. By enhancing water productivity and promoting soil health through conservation practices, agricultural systems can become more resilient to climate change and variability.

**Strengthen Digital Platforms for Agriculture:** Enhance digital platforms for data management, decision support, and knowledge dissemination in agriculture. By leveraging technology, farmers can access information and resources to improve productivity, sustainability, and resilience in their farming practices.

**Promote Gender Inclusivity and Skill Development:** Implement policies and programs to promote gender inclusivity and empower women in agriculture. Additionally, focus on skill development initiatives for youth, ensuring they have the necessary knowledge and expertise to contribute to the agricultural sector effectively.

**Foster International Collaboration:** Encourage partnerships for international collaboration in research, education, and development in agriculture. By sharing knowledge, resources, and best practices on a global scale, countries can work together to address common challenges and achieve shared goals related to food security and nutrition.

## PUBLICATIONS

The Academy brought out following publications during the year:



### *Policy Papers (PP)*

- PP 119 : Secondary Agriculture – Challenges, Opportunities and Way Forward
- PP 120 : Scaling up Innovative Agricultural Extension Models
- PP 121 : Self-sufficiency in Edible Oil Production
- PP 122 : Beyond Price Support and Subsidy
- PP 123 : Impact of COVID 19 on Livestock (Animal Health and Dairy/Poultry/ Meat/ Feed Industry)
- PP 124 : Enhancing Agri-Infrastructure and Agri-Business Development through Public-Private Partnerships (PPPs) in India
- PP 125 : Food Safety Strategies for Indian Fisheries Sector



### *Newsletter*

NAAS-News, Vol 23, Nos 2 to 4 and Vol. 24, No. 1 (quarterly)

### *Journal (published by Springer India Pvt. Ltd)*

NAAS Official Journal 'Agricultural Research'  
Vol. 12, Nos. 2 to 4 and Vol. 13 No. 1 (Quarterly)



## Books

1. Transformation of Agri-Food Systems
2. State of Indian Agriculture



## EVENTS AND MEETINGS

### *New Year Get-together*

A get-together of the Academy Fellows and Associates was organized on January 1, 2024 in hybrid mode. At the outset, Dr. W. S. Lakra (Secretary) welcomed Dr. Himanshu Pathak (President); Past Presidents Dr. R. B. Singh and Dr. T. Mohapatra; all office bearers and all esteemed Fellows and Associates. He also acknowledged the leadership transition, by welcoming Dr. P.K. Joshi as the new Vice President, Dr. Ashok K. Singh as the new Secretary, and Dr. Rakesh K. Jain as the new Editor, along with new Executive Council members of the Academy. The outgoing members were thanked for their significant contributions to the Academy.



Dr. Himanshu Pathak, (President, NAAS), while reflecting on Academy's achievements during 2023, including fellowship recognitions, collaborations and successful XVI Agricultural Science Congress, greeted the Fellowships and wished New Year 2024 to all. Newer initiatives such as online nominations, journal scoring, and student engagement programs were discussed, along with strategies for financial sustainability following the government's cessation of funding. The Academy deliberated on collaborations with foreign Academies, enhancing media outreach, aiming to augment its global presence and impact. The importance of policy advocacy, adaptation to new technologies, and alignment with national education policies were underscored, with a view to develop a roadmap for agricultural innovations by 2047.

The meeting stressed the need to address challenges such as hunger, poverty, and climate change. Key next steps included generating additional budgetary resources,

prioritizing agricultural education reforms, addressing India's Global Hunger Index ranking, and developing implementation pathways for action plans with defined actions and accountability.



The Academy also proposed initiatives such as Memorizing

Dr. Swaminathan through Foundation Day lecture; recording lectures for students benefit, inducting interested Fellows as Adjunct Faculty in Universities, and organizing workshops with journalists to enhance agricultural awareness.

### *Conveners of Regional Chapters Meeting*

- A meeting of the Conveners of Regional Chapters was held under the chairmanship of the Dr. Himanshu Pathak (President, NAAS) on June 3, 2023 in hybrid mode to review the progress of their activities. Conveners presented an overview of their chapters' activities and future plans.
- Another meeting of the Conveners of the Regional Chapters was held on December 22, 2023 in virtual mode under the Chairmanship of Dr. Himanshu Pathak, President (NAAS), to review the activities conducted during 2023 and outline the plans for the year 2024.



Dr. Pathak in his opening remarks praised the commendable efforts of the Regional Chapters during 2023. He also briefed them on navigating the path forward and implementing plans for the year 2024. The President urged all the Conveners to arrange activities in their respective regions aligning with the theme of Digital Agriculture. Furthermore, the Chapters were advised to foster collaboration with Professional Societies in their respective regions. Subsequently, the President invited suggestions for the successful conduct of this initiative.

## *Executive Council Meetings*

During 2023-24, six EC meetings were held either online or hybrid mode. Some of the important items considered and actions taken during the meetings were as follows:

### **131st Meeting**

The 131<sup>st</sup> EC Meeting of NAAS Executive Council was held in hybrid mode on April 29, 2023 under the Chairmanship of Dr. Himanshu Pathak (President, NAAS).

The President emphasized the need to enhance the Academy activities with closer interphase with the teachers, students, farmers, industry representatives and media to broaden its horizon and increase visibility. It was decided that henceforth Panel Discussions on important issues will be held during the Foundation Day Celebrations in place of the presentations of the newly inducted Fellows. The panel discussions held on June 04, 2023 were:

1. Roadmap for Agricultural Research, Education and Extension for Amrit Kaal -2047
2. Empowering SAUs to Meet the Emerging Challenges in Agriculture.

It was proposed to invite a progressive farmer, SAU representative (President IAUA) and industry leader as Special Invitees in the EC Meetings with no voting rights. It was also decided that NAAS should bring out publications on (i) State of Indian Agriculture and (ii) Indian Agriculture in the Amrit Kaal: The Road Map'. Besides a Committee was constituted under the Chairmanship of Dr. Anil K. Singh, (Vice President, NAAS), to deliberate on the feasibility and modalities of probable changes in rules and bye-laws in order to implement new changes.

## 132nd Meeting

The 132<sup>nd</sup> EC Meeting was held in hybrid mode on June 3, 2023 under the Chairmanship of Dr. Himanshu Pathak (President, NAAS). After reviewing the preparations for the XVI ASC, recommendations of the Committee chaired by Dr. AK Singh to review and suggest changes in the Objectives and the Bye laws of the Academy and to introduce new categories and criteria for inducting Fellows were presented and deliberated upon. It was decided that the suggested changes will be put up to the General Body for approval.

Further, it was decided that of the two publications (i) the State of Indian Agriculture and (ii) Indian Agriculture in the Amrit Kaal: the Road Map', the State of Indian Agriculture will be published annually to be released on January 1<sup>st</sup> every year. Dr. Anjani Kumar and Dr P.K. Joshi were entrusted with the responsibility to develop these documents, respectively. Thereafter, the Secretary and the Treasurer outlined the reports and resolutions to be presented before the General Body for approval. The EC was informed about the appointments of the new Executive Director and an Editorial Manager.

## 133rd Meeting

The 133<sup>rd</sup> EC Meeting was held in hybrid mode on September 16, 2023 under the Chairmanship of Dr. Himanshu Pathak (President, NAAS). Some of the important issues discussed during the meeting included

- Progress on the publication of (a) State of Indian Agriculture and (b) Indian Agriculture in the Amrit Kaal: The Road Map'
- Review and revision of the Objectives, Bye-laws of the Academy for proposed Fellowship to Teachers, Industry Leaders and Innovative Farmers. It was decided that the existing procedure of awarding NAAS Fellowship would continue
- An update on generating revenue for the Academy from various sources
- Consideration of recommendations of Sectional Committees for finalization of Academy Fellowships/ Associates and Young Scientist Awards for the year 2024, and suggestions for further improvement in the selection process;
- Preparation of panel for election of the Office bearers and Members of the Executive Council 2024, based on the proposals received from the Fellowship.

Dr. A. Gopalakrishnan, Director, ICAR-CMFRI, Kochi, and the Organizing Secretary, XVI ASC provided an update on the logistic preparations and budgetary considerations.

The President conveyed to the Council that the Academy's journal "Agricultural Research" has achieved an International Impact Factor of 1.4, resulting in NAAS score of 7.4, for which he congratulated the Editor-in-Chief Dr. Anupam Varma and his team.

### 134th Meeting

The 134<sup>th</sup> EC Meeting was held in hybrid mode on October 10, 2023 and chaired by Dr. Himanshu Pathak (President, NAAS). After brief welcome, Dr. W.S. Lakra, (Secretary, NAAS) informed about the sad demise of Prof. M.S. Swaminathan, Indian Agriculture Titan and Founder President of the Academy, on September 28, 2023, and one minute silence was observed as a mark of respect. Thereafter, the agenda items were deliberated upon by the EC. Some of the important points emerged during the meeting were:

- Update on the status of publications on (i) Indian Agriculture on the Amrit Kaal: the Road Map and (ii) State of Indian Agriculture.
- Update on revenue generation for the Academy from various sources.
- "Digital Agriculture" theme for deliberations during 2024.
- To establish an award of the Academy in the honour of Prof. M.S. Swaminathan.

### 135th Meeting

The 135<sup>th</sup> EC Meeting was held in hybrid mode on December 8, 2023 under the Chairmanship of Dr. Himanshu Pathak (President, NAAS). Dr. Pathak complimented the fellowship on successful organization of the XVI Agriculture Science Congress (ASC) at CMFRI, Kochi and appreciated the local organizing committee for its efforts in making the event successful. He complimented the members of the Programme Committee for ensuring well-structured inclusive technical deliberations and the Organizing Committees which worked tirelessly to provide the logistics support. New Office Bearers and Members of the Executive Council elected from January 1, 2024 were approved (see Box).

The vacancy of the EC member resulting from the nomination of Dr. Ashok Kumar Singh as Secretary will be addressed as a Casual Vacancy after December 31, 2023.

1.	Vice-President	Dr Pramod Kumar Joshi
2.	Secretary	Dr Ashok Kumar Singh
3.	Editor	Dr. Rakesh Kumar Jain
4.	Members (4)	Prof. Bishwanath Chakraborty Dr. (Ms) Pagadala Damodaram Kamala Jayanthi Dr. (Ms) Minakshi Prasad Dr. Om Parkash Yadav

### 136th Meeting

The 136<sup>th</sup> Meeting of the Executive Council was held in hybrid mode on March 16, 2024 under the Chairmanship of Dr. Himanshu Pathak (President, NAAS). After brief welcome, the agenda items were deliberated upon by the EC. Some of the important points emerged during the meeting were:

- Updates on two publications on Indian Agriculture, i.e. “State of Indian Agriculture” written by Dr. Anjani Kumar and Dr. Himanshu Pathak and “Indian Agriculture in the AmritKaal: The Road Map” by Dr. P. K. Joshi.
- Finalization of G. B. Pant University of Agriculture and Technology, Pantnagar as the venue for the XVII Agricultural Science Congress scheduled for 2025.
- Updates on upcoming events, such as NAAS-PAAS linkages, Prof. M.S. Swaminathan Foundation Day Lecture, and scholarship programs for students pursuing agricultural courses.
- Besides Social Sciences section, Bioinformatics discipline shall find place in other related sections also. Furthermore, constituted Sectional Committees for the election of Fellows/Associates and Young Scientist Awards for 2025 were constituted.
- Finalization of various Conveners for NAAS Regional Chapters, along with updates on legal matters and financial grants received by the Academy.





Proposals for additional awards, collaboration with external organizations such as World Food Prize Foundation, and progress on various workshops and publications were reviewed.

General updates on special invitees, nomination processes, upcoming virtual meetings, facility upgrades, and plans for future events, including Inter-Academy and Industry meets, were shared with the council members.

The meeting concluded with vote of thanks by Dr. W.S. Lakra (Secretary, NAAS) expressing gratitude to all members for their active participation.

### *Journal Score Committee*

The Journal Score Committee (2023-25) was constituted by the Academy with the approval of President (NAAS) for finalizing the evaluation proforma for assigning NAAS Score to non-impact factor scientific journals. The committee with Dr. Anil K. Singh as the Chairman and Dr. W.S. Lakra as Member Secretary after detailed deliberation finalized the score card and circulated the same for inviting application for journal evaluation for NAAS Score 2024-26.

As of now, 3208 journals of all sections are in the NAAS Journal Score database. Of 690 non-impact factor journals, 388 applications for journal evaluation were received in the Academy for NAAS Score 2024-26. The NAAS Score has been uploaded on the website on January 1, 2024, which will be Valid till December 31, 2026.

### *Programmes Planned for 2024*

<b>Brainstorming Sessions</b>	<b>Convener</b>
Strategies and policy design for enhancing the global footprint of Indian spices	Dr. Duraisamy Prasath
Smart Animal Farming: Perspective Planning Towards 5 Trillion Economy	Dr. Y.S. Malik
Cellular Fish Meat production: Prospects and Challenges	Dr. C.N. Ravishankar; Dr. A. Gopalakrishnan

*Contd...*

<b>Brainstorming Sessions</b>	<b>Convener</b>
Underutilized Wild Fruit & Vegetables for Nutritional and Health Security: Policy Perspectives	Dr. T.K. Behera
Climate Adaptive Conservation of Aquatic Genetic Resources	Dr. U.K. Sarkar
Artificial Intelligence and IoT in Agriculture	Dr. Rajender Parsad
Agrivoltaics in Agriculture	Drs. A.K. Sikka and P. Santra
Enhancing Investment in Research for Indian Agriculture	Dr. P.S. Birthal
Promotion of Agricultural Export: Prospects and Challenges	Dr. Naveen P. Singh

<b>Strategy Workshops</b>	<b>Convener</b>
Crop Protection Solutions: Group MRL & Minor Uses of pesticides	Dr. P.K. Chakrabarty
Maize to Ethanol in India: Prospects and Strategies	Dr. H.S. Jat
Carbon Farming	Drs. Biswapati Mandal and V.K. Sehgal, IARI
Water Security: Is Quantum or Management the Issue	Drs. Anil K. Singh and K. Palanisamy
Nano Fertilizers	Drs. V.K. Singh and S.S. Rathore

## **FINANCIAL STATEMENT**

The Academy received from Department of Agricultural Research and Education (DARE), New Delhi, Grant-in-Aid of Rs. 62 lakh during the year 2023-24. The Accounts of the Academy are audited by Chartered Accountants appointed with the approval of the General Body. The Utilization Certificate for the year 2023-24 has been submitted to the DARE. A brief Audited Statement of Accounts and Auditor's Report for 2023-24 is annexed as Annexure I & II.

## ACKNOWLEDGEMENTS

The Academy gratefully acknowledges the Department of Agricultural Research and Education (DARE) and the Indian Council of Agricultural Research (ICAR), for their continued financial and logistics support. The Academy also places on record the cooperation and support in terms of logistics provided by other organizations. Academy's publication activities are largely due to the voluntary and honorary services of its Editor-in-Chief, Editors, Associate Editors, Advisory Board, NAAS Office Bearers and EC Members, large number of Reviewers (who examine and provide comments and suggestions on the manuscripts). The esteemed Fellows also lend their services for various activities of the Academy such as Annual General Body Meeting, Scoring of Research Journals, critically examining nominations for new Fellowship and Academy Awards, Agricultural Science Congress, Brainstorming Sessions, Strategy Workshops, Symposia and conducting Programmes on Public Lectures, Interaction Meetings, etc. The Academy gratefully acknowledges the services of the Fellowship and NAAS Secretariat staff involved in the above activities during the year.

## AUDITORS REPORT



**Pawan Shubham & Co.**  
CHARTERED ACCOUNTANTS

601, ROOTS TOWER  
7, District Center  
Laxmi Nagar, Delhi-110092  
Pawan@pawanshubham.com  
Tel 011-45108755

### Independent Auditor's Report

TO,

THE MEMBERS,  
**NATIONAL ACADEMY OF AGRICULTURAL SCIENCES**  
NASC COMPLEX, DPS MARG, PUSA  
NEW DELHI-110012

We have audited the attached Balance Sheet of **National Academy of Agricultural Sciences (hereinafter "Academy")**, New Delhi as on 31<sup>st</sup> March 2024, the Income and Expenditure Account, the receipt and payment accounts and notes annexed for the year ended on that date (hereinafter "Financial Statements").

#### Management's Responsibility for the Financial Statements

Management is responsible for the preparation of these financial statements. This responsibility includes maintenance of adequate accounting records for safeguarding of assets of the Academy and for preventing and detecting frauds and other irregularities; selection and application of appropriate policies; maintenance of adequate internal control for ensuring the accuracy and completeness of the accounting records relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

#### Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with the Standards on Auditing issued by the Institute of Chartered Accountants of India. Those Standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Academy's preparation of the financial statements that give a true and fair view. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of the accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.





**Pawan Shubham & Co.**  
CHARTERED ACCOUNTANTS

601, ROOTS TOWER  
7, District Center  
Laxmi Nagar, Delhi-110092  
Pawan@pawanshubham.com  
Tel 011-45108755

### Opinion

In our opinion and to the best of our information and according to the explanations given to us, the said statements of accounts read together with notes thereon and documents annexed there to give a true and fair view:

- a. In the case of balance sheet, of the state of affairs as at 31<sup>st</sup> March 2024.
- b. In the case of Income and Expenditure Account, of the excess of Expenditure over Income for the year ended on that date.
- c. In the case of Receipts and Payments Accounts, of the receipts and payments for the year ended on that date.

For PAWAN SHUBHAM & CO.  
Chartered Accountants  
Firm Registration No.: 011573C

(CA Pawan Kumar Agarwal)  
Partner  
M. No. 092345  
UDIN: 240923458KCI EU9667



Place: New Delhi

Date: 28-05-2024



**Notes to Accounts:**

**1. Basis of preparation of financial statements**

The financial statements have been prepared under the historical cost convention on going-concern basis in accordance with the generally accepted accounting principles and in accordance with the mandatory accounting standards issued by the Institute of Chartered Accountants of India.

**2. Recognition of Income and Expenditure**

Revenues/Income is accounted on accrual basis as and when they are earned in accordance with the generally accepted accounting principles.

**3. Investments**

a. The Academy has made investments as required to be invested under section 11(5) of the Income Tax Act, 1961 and value of the investments are shown at cost.

b. Income from investment has been recognized on accrual basis.

**4. Fixed Assets and Depreciation**

Fixed assets are stated at written down value less depreciation calculated as per the rates of Depreciation provided in the Income Tax Act 196, read with the rules made there under.

**5. Income Tax Provision and Contingent Liabilities**

The following tax demand raised by Income tax department for which Academy has filed appeal against the same before the CIT (A) Delhi. Management is of the view that no addition should sustain hence, no provisions is made.

S. No.	Financial Year	Assessment Year	Amount Rs.
1.	2016-17	2017-18	1,11,91,925/-
2.	2017-18	2018-19	3875100/-
3.	2019-20	2020-21	1,97,64,460/-
4.	2020-21	2021-22	1,57,99,840/-

For PAWAN SHUBHAM & CO.  
Chartered Accountants  
Firm Registration Nos.:011573C

(CA Pawan Kumar Agarwal)  
Partner  
M. No. 092345  
Place: New Delhi  
Dated: 28-05-2024



National Academy of Agricultural Sciences

Secretary



Treasurer

**NATIONAL ACADEMY OF AGRICULTURAL SCIENCES**  
**BALANCE SHEET AS AT 31 MARCH, 2024**

LIABILITIES	AMOUNT (Rs.)	ASSETS	AMOUNT (Rs.)
<b>CAPITAL FUND</b>		<b>FIXED ASSETS (Ann. B.S. 1)</b>	
Opening Balance	17,71,39,555	Opening Balance	1,43,54,303
Add: Transferred from Accumulated Fund	4,87,57,514	Additions during the year	83,98,512
Less: Excess of Expenditure over income during the year	(87,36,133)	Deletion during the year	(40,000)
Add: Unutilised for FY 2017-18	1,58,39,782	Depreciation for the year	(23,53,021)
Less: Funds transferred to Specific Reserve Fund	3,04,75,144		2,03,59,795
		<b>INVESTMENTS:</b>	
<b>SPECIFIC RESERVE FUND</b>		Term Deposit with Canara Bank	23,54,47,031
Opening Balance	17,11,48,985	Interest Accrued on FDR with Canara Bank	82,11,483
Add: Addition during the year	3,04,75,144		
Less: Unutilised for FY 2017-18	1,58,39,782	<b>CURRENT ASSETS</b>	
Less: Utilized during the year	4,87,57,514	Sundry Debtor (Ann. B.S. 5)	5,53,756
		Bank Balances (Ann. B.S. 2)	28,94,043
<b>ENDOWMENT FUND</b>		Cash Balances (Imprest A/c)	4,876
Opening Balance	20,00,000		
Received during the year	-	<b>ADVANCES</b>	
		Advances with NAAS Regional Chapters (Ann. B.S. 3)	4,92,265
<b>CURRENT LIABILITIES</b>		Income Tax Receivable	1,45,91,679
National Soil & Land Use Policy		GST Receivable	29,62,307
Developing Proforma to Rank ICAR Institutions			
Earnest Money (MM ACTIV)		<b>TOTAL</b>	<b>34,55,17,235</b>
PFMBY Project			
Sundry Creditors & other Liabilities (Ann. B.S. 4)			
Provision for Current Income Tax			
<b>TOTAL</b>	<b>34,55,17,235</b>		

**Refer Notes Attached To and forming part of Accounts.**

As per our report of even date attached

**For Pawan Shubham & Co**

Chartered Accountants

Firm Registration No. 011573C



**Pawan Kumar Agarwal**

Partner

M.No.062345

Place: New Delhi

Date: 28-05-2024

National Academy of Agricultural Sciences



**Secretary**

**Treasurer**

**NATIONAL ACADEMY OF AGRICULTURAL SCIENCES**  
**INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED ON 31st MARCH, 2024**

EXPENDITURE	AMOUNT (Rs.)	INCOME	AMOUNT (Rs.)
To Expenditure towards NAAS activities (Ann. I.E. I)	4,41,04,363	By Grant-in-Aid from D.A.R.E.	62,00,000
To Depreciation (Ann. B.S. I)	23,53,021	By Grant Financial Assistance From ICAR-For XVI-ASC -Kochhi	20,00,000
		By Interest on Investment	2,12,68,975
		By Interest, Contribution from Subscriptions, Publications and Other receipts towards NAAS activities (Ann. I.E. 2)	1,45,84,136
		To Excess of Expenditure over Income	24,04,273
<b>Total:</b>	<b>4,64,57,383</b>	<b>Total:</b>	<b>4,64,57,383</b>
To Excess of Expenditure over Income	24,04,273		
To Income tax for the FY 2022-23	49,42,012		
To Provision for Current Income Tax	13,89,848	By Transfer to Capital Fund	87,36,133
<b>Total:</b>	<b>87,36,133</b>	<b>Total:</b>	<b>87,36,133</b>

Refer Notes Attached To and forming part of Accounts.  
As per our report of even date attached

For Pawan Shubham & Co  
Chartered Accountants  
Firm Registration No. 011573C

  
**Pawan Kumar Agarwal**  
Partner  
M.No.092345

Place: New Delhi  
Date: 28-05-2024



National Academy of Agricultural Sciences



  
Secretary

  
Treasurer





## EXECUTIVE COUNCIL

Position	2023	2024
President	Dr. Himanshu Pathak	Dr. Himanshu Pathak
Immediate Past President	Dr. T. Mohapatra	Dr. T. Mohapatra
Vice-President	Dr. Anil K. Singh	Dr. K.M. Bujarbaruah
Vice-President	Dr. K.M. Bujarbaruah	Dr. P.K. Joshi
Secretary	Prof. K.C. Bansal	Dr. W.S. Lakra
Secretary	Dr. W.S. Lakra	Dr. Ashok K. Singh
Foreign Secretary	Prof. Rajeev K. Varshney	Prof. Rajeev K. Varshney
Editor	Dr. Malavika Dadlani	Dr. V.K. Baranwal
Editor	Dr. V.K. Baranwal	Dr. Rakesh Kumar Jain
Treasurer	Dr. Rajender Parsad	Dr. Rajender Parsad
Member	Dr. M.S. Chauhan	Prof. Agepati S. Raghavendra
Member	Dr. S.K. Datta	Dr. Anjani Kumar
Member	Dr. Anjani Kumar	Dr. B. Mohan Kumar
Member	Dr. B. Mohan Kumar	Prof. Bishwanath Chakraborty
Member	Dr. Suman K. Pandey	Dr. C.N. Ravishankar
Member	Dr. R.T. Patil	Dr. Devendra Kumar Yadava
Member	Prof. A.R. Podile	Dr. E.V.S. Prakasa Rao
Member	Dr. E.V.S. Prakasa Rao	Dr. (Ms) Minakshi Prasad
Member	Dr. A.S. Raghavendra	Dr. Om Parkash Yadav
Member	Dr. C.N. Ravishankar	Dr. (Ms) P.D. Kamala Jayanthi
Member	Dr. (Ms) G. Taru Sharma	Dr. R.T. Patil
Member	Dr. Ashok K. Singh	Dr. Suman K. Pandey
ICAR Nominee	Shri Sanjay Garg	Shri Sanjay Garg

## Secretariat

1. Ms. Deeksha Gupta, Executive Director
2. Shri S.K. Sharma, Budget & Accounts Executive
3. Ms. Minu Tiwari, Chief Programme Executive
4. Shri P. Krishna, Programme Executive
5. Dr. Manoj Kumar Singh, Editorial Manager
6. Ms. Rashmi Singh, Editorial Manager
7. Shri Jai Singh, Office Management Jr. Executive
8. Shri Chitesh Kaushik, Computer Operator
9. Shri B.L. Yadav, Driver cum Office Assistant
10. Shri Kamal Singh, General Office Assistant
11. Shri Shiv Dev Yadav, Office Assistant

## LIST OF ACRONYMS

ADG	Assistant Director General
AGM	Annual General Body Meeting
AI	Artificial Intelligence
ANGRAU	Acharya N. G. Ranga Agricultural University
ASC	Agricultural Science Congress
ASRB	Agricultural Scientists Recruitment Board
BSS	Brainstorming Session
CMFRI	Central Marine Fisheries Research Institute
CRIJAF	Central Research Institute for Jute and Allied Fibers
DARE	Department of Agricultural Research and Education
DBT	Department of Biotechnology
DDG	Deputy Director General
DG	Director General
DSI	Digital Sequence Information
EC	Executive Council
FAO	Food and Agriculture Organization
FNAAS	Fellow National Academy of Agricultural Sciences
FRA	Fishery Resources Assessment
FRS	Fellow of the Royal Society
FS	Fisheries Science
FSSAI	Food Safety and Standards Authority of India
IARI	Indian Agricultural Research Institute
ICAR	Indian Council of Agricultural Research
IIVR	Indian Institute of Vegetable Research
IISR	Indian Institute of Sugarcane Research
IIMR	Indian Institute of Millets Research

KVK	Krishi Vigyan Kendra
MPKV	Mahatma Phule Krishi Vidyapeeth
NAARM	National Academy of Agricultural Research Management
NAAS	National Academy of Agricultural Sciences
NABI	National Agri-Food Biotechnology Institute
NASC	National Agricultural Science Complex
NFSA	National Food Security Act
NIANP	National Institute of Animal Nutrition and Physiology
NIAP	National Institute of Agricultural Economics and Policy Research
NIASM	National Institute of Abiotic Stress Management
NIIST	National Institute for Interdisciplinary Science & Technology
NJSC	NAAS Journal Score Committee
NRCG	National Research Centre for Grapes
NRM	Natural Resource Management
NRRI	National Rice Research Institute
SBI	Sugarcane Breeding Institute
SDG	Sustainable Development Goals
VNMKV	Vasantrao Naik Marathwada Krishi Vidyapeeth

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## NAAS DOCUMENTS ON POLICY ISSUES

### Policy Papers

76. Bio-fuels to Power Indian Agriculture	2015
77. Aquaculture Certification in India: Criteria and Implementation Plan	2015
78. Reservoir Fisheries Development in India: Management and Policy Options	2016
79. Integration of Medicinal and Aromatic Crop Cultivation and Value Chain Management for Small Farmers	2016
80. Augmenting Forage Resources in Rural India: Policy Issues and Strategies	2016
81. Climate Resilient Livestock Production	2016
82. Breeding Policy for Cattle and Buffalo in India	2016
83. Issues and Challenges in Shifting Cultivation and its Relevance in the Present Context	2016
84. Practical and Affordable Approaches for Precision in Farm Equipment and Machinery	2016
85. Hydroponic Fodder Production in India	2017
86. Mismatch between Policies and Development Priorities in Agriculture	2017
87. Abiotic Stress Management with Focus on Drought, Flood and Hailstorm	2017
88. Mitigating Land Degradation due to Water Erosion	2017
89. Vertical Farming	2019
90. Zero Budget Natural Farming - A Myth or Reality?	2019
91. Loan Waiving versus Income Support Schemes: Challenges and Way Forward	2019
92. Tropical Wilt Race-4 Affecting Banana Cultivation	2019
93. Enhancing Science Culture in Agricultural Research Institutions	2020
94. Payment of Ecosystem Services	2020
95. Food-borne Zoonotic Diseases	2020
96. Livestock Improvement through Artificial Insemination	2020
97. Potential of Non-Bovine Milk	2021
98. Agriculture and Food Policy for the Five Trillion Dollar Economy	2021
99. New Agricultural Education Policy for Reshaping India	2021
100. Strategies for Enhancing Soil Organic Carbon for Food Security and Climate Action	2021
101. Big Data Analytics in Agriculture	2021
102. WTO and Indian Agriculture: Issues, Concerns, and Possible Solutions	2022
103. Antimicrobial Resistance	2022
104. One World One Health	2022
105. Sugarcane-based Ethanol Production for Sustainable Fuel Ethanol Blending Programme	2022
106. Utilization of Wastewaters in Urban and Peri-urban Agriculture	2022
107. Certification of Quality Planting Material of Clonally Propagated Fruit Crops For Promoting Agricultural Diversification	2022
108. Agri-Startups in India: Opportunities, Challenges and Way Forward	2022
109. Emergency Preparedness for Prevention of Transboundary Infectious Diseases in Indian Livestock and Poultry	2022
110. Strategies and Approaches for Promotion of Sustainable Bivoltine Sericulture in India	2022
111. Food Fortification : Issues and Way Forward	2022
112. Gender and Nutrition based Extension in Agriculture	2022
113. Contract Farming for Transforming Indian Agriculture	2022
114. Promoting Millet Production, Value Addition and Consumption	2022
115. Waste to Wealth – Use of Food Waste as Animal Feed and Beyond	2022
116. Sustaining the Pulses Revolution in India: Technological and Policy Measures	2022
117. Road Map for Rehabilitation of 26 Mha Degraded Lands in India	2022
118. Entrepreneurship for Quality Fodder Production	2022
119. Secondary Agriculture - Challenges, Opportunities and Way Forward	2023
120. Scaling up Innovative Agricultural Extension Models	2023
121. Self-sufficiency in Edible Oil Production	2023
122. Beyond Price Support and Subsidy	2023
123. Impact of COVID 19 on Livestock (Animal Health and Dairy/Poultry/Meat/Feed Industry)	2023
124. Enhancing Agri-Infrastructure and Agri-Business Development through Public-Private Partnerships (PPPs) in India	2024
125. Food Safety Strategies for Indian Fisheries Sector	2024

### Status / Strategy Papers

1. Role of Social Scientists in National Agricultural Research System (NARS)	2015
2. Towards Self-sufficiency of Pulses in India	2016
3. Strategy for Transformation of Indian Agriculture for Improving Farmers Welfare	2016
4. Sustaining Soybean Productivity and Production in India	2017
5. Strengthening Agricultural Extension Research and Education - The Way Forward	2017
6. Strategy on Utilization of Glauconite Mineral as Source of Potassium	2017
7. Vegetable Oil Economy and Production Problems in India	2017
8. Conservation Policies for Hilsa and Mahseer	2018
9. Accelerating Seed Delivery Systems for Priming Indian Farm Productivity Enhancement: A Strategic View Point	2018
10. Renewable Energy: A New Paradigm for Growth in Agriculture	2018
11. Rumen Microbiome and Amelioration of Methane Production	2019
12. Harnessing Full Potential of A1 and A2 Milk in India: An Update	2019
13. Development and Adoption of Novel Fertilizer Materials	2019
14. Innovations in potato seed production	2021
15. Potential of Transgenic Poultry for Biopharming	2022
16. Need for Breeding Tomatoes Suitable for Processing	2022
17. Biofortification to Address Malnutrition in India: Present Status and Way Forward	2022
18. Drudgery Reduction in Agriculture through Improved Farm Machinery	2022

### Policy Briefs

1. To Accelerate Utilization of GE Technology for Food & Nutrition Security and Improving Farmers' Income	2016
2. Innovative Viable Solution to Rice Residue Burning in Rice-Wheat Cropping System through Concurrent Use of Super Straw Management System-fitted Combines and Turbo Happy Seeder	2017
3. Soil Health: New Policy Initiatives for Farmers Welfare	2018
4. Uniform Policy for Fish Disease Diagnosis and Quarantine	2019
5. Saving the Harvest: Reducing the Food Loss and Waste	2019
6. Better Management of Pesticides in India: Policy Perspectives	2019
7. Regulatory Framework for Genome Edited Plants: Accelerating the Pace and Precision of Plant Breeding	2020
8. Covid-19 Pandemic: Impact and New Normal in Agriculture	2020
9. Direct Benefit Transfer of Fertilizer Subsidy: Policy Perspectives	2020
10. Harmonization of seed regulations for sustainable food security in India	2020
11. Towards Revision of Biological Diversity Act 2002	2021
12. Limitations of Global Hunger Index and Way Forward	2022
13. Regulation for Genetically Modified (GM) Foods and Detection of Unauthorized GM Food Events	2022

## NAAS DOCUMENTS ON POLICY ISSUES\*

### Policy Papers

1. Agricultural Scientist's Perceptions on National Water Policy	1995
2. Fertilizer Policy Issues (2000-2025)	1997
3. Harnessing and Management of Water Resources for Enhancing Agricultural Production in the Eastern Region	1998
4. Conservation, Management and use of Agro-biodiversity	1998
5. Sustainable Agricultural Export	1999
6. Reorienting Land Grant System of Agricultural Education in India	1999
7. Diversification of Agriculture for Human Nutrition	2001
8. Sustainable Fisheries and Aquaculture for Nutritional Security	2001
9. Strategies for Agricultural Research in the North-East	2001
10. Globalization of Agriculture: R & D in India	2001
11. Empowerment of Women in Agriculture	2001
12. Sanitary and Phytosanitary Agreement of the World Trade Organization Advantage India	2001
13. Hi-Tech Horticulture in India	2001
14. Conservation and Management of Genetic Resources of Livestock	2001
15. Prioritization of Agricultural Research	2001
16. Agriculture-Industry Interface: Value Added Farm Products	2002
17. Scientists' Views on Good Governance of An Agricultural Research Organization	2002
18. Agricultural Policy: Redesigning R & D to Achieve It's Objectives	2002
19. Intellectual Property Rights in Agriculture	2003
20. Dichotomy Between Grain Surplus and Widespread Endemic Hunger	2003
21. Priorities of Research and Human Resource Development in Fisheries Biotechnology	2003
22. Seaweed Cultivation and Utilization	2003
23. Export Potential of Dairy Products	2003
24. Biosafety of Transgenic Rice	2003
25. Stakeholders' Perceptions On Employment Oriented Agricultural Education	2004
26. Peri-Urban Vegetable Cultivation in the NCR Delhi	2004
27. Disaster Management in Agriculture	2004
28. Impact of Inter River Basin Linkages on Fisheries	2004
29. Transgenic Crops and Biosafety Issues Related to Their Commercialization in India	2004
30. Organic Farming: Approaches and Possibilities in the Context of Indian Agriculture	2005
31. Redefining Agricultural Education and Extension System in Changed Scenario	2005
32. Emerging Issues in Water Management The Question of Ownership	2005
33. Policy Options for Efficient Nitrogen Use	2005
34. Guidelines for Improving the Quality of Indian Journals & Professional Societies in Agriculture and Allied Sciences	2006
35. Low and Declining Crop Response to Fertilizers	2006
36. Belowground Biodiversity in Relation to Cropping Systems	2006
37. Employment Opportunities in Farm and Non-Farm Sectors Through Technological Interventions with Emphasis on Primary Value Addition	2006
38. WTO and Indian Agriculture: Implications for Policy and R&D	2006
39. Innovations in Rural Institutions: Driver for Agricultural Prosperity	2007
40. High Value Agriculture in India: Prospects and Policies	2008
41. Sustainable Energy for Rural India	2008
42. Crop Response and Nutrient Ratio	2009
43. Antibiotics in Manure and Soil A Grave Threat to Human and Animal Health	2010
44. Plant Quarantine including Internal Quarantine Strategies in View of Onslaught of Diseases and Insect Pests	2010
45. Agrochemicals Management: Issues and Strategies	2010
46. Veterinary Vaccines and Diagnostics	2010
47. Protected Agriculture in North-West Himalayas	2010
48. Exploring Untapped Potential of Acid Soils of India	2010
49. Agricultural Waste Management	2010
50. Drought Preparedness and Mitigation	2011
51. Carrying Capacity of Indian Agriculture	2011
52. Biosafety Assurance for GM food Crops in India	2011
53. Ecolabelling and Certification in Capture Fisheries and Aquaculture	2012
54. Integration of Millets in Fortified Foods	2012
55. Fighting Child Malnutrition	2012
56. Sustaining Agricultural Productivity through Integrated Soil Management	2012
57. Value Added Fertilizers and Site Specific Nutrient Management (SSNM)	2012
58. Management of Crop Residues in the Context of Conservation Agriculture	2012
59. Livestock Infertility and its Management	2013
60. Water Use Potential of Flood-affected and Drought-prone Areas of Eastern India	2013
61. Mastitis Management in Dairy Animals	2013
62. Biopesticides – Quality Assurance	2013
63. Nanotechnology in Agriculture: Scope and Current Relevance	2013
64. Improving Productivity of Rice Fallows	2013
65. Climate Resilient Agriculture in India	2013
66. Role of Millets in Nutritional Security of India	2013
67. Urban and Peri-Urban Agriculture	2013
68. Efficient Utilization of Phosphorus	2014
69. Carbon Economy in Indian Agriculture	2014
70. MOOC for Capacity Building in Indian Agriculture: Opportunities and Challenges	2014
71. Role of Root Endophytes in Agricultural Productivity	2014
72. Bioinformatics in Agriculture: Way Forward	2014
73. Monitoring and Evaluation of Agricultural Research, Education and Extension for Development [AREE4D]	2014
74. Biodrainage: An Eco-friendly Tool for Combating Waterlogging	2015
75. Linking Farmers with Markets for Inclusive Growth in Indian Agriculture	2015

*Continued on inside cover*