



# ANNUAL REPORT

## (DARE)

### 2023-24



Department of Agricultural Research & Education  
Ministry of Agriculture and Farmers Welfare  
Government of India





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## FOREWORD

**G**OVERNMENT is putting greater emphasis on Research and Development (R&D) for sustainable agricultural production in the country. Department of Agricultural Research and Education (DARE)/Indian Council of Agricultural Research (ICAR) through their research, education and extension programmes, are committed to transform Indian agriculture from food self-sufficiency to enhancing profitability.

Central Agricultural University (CAU), Imphal was established in the year 1993 under the Central Agricultural University Act, 1992 of the parliament (Act No. 40 of 1992) which came into effect on 26 January 1993. It is a residential university having 13 constituent colleges covering 7 north-east hill states under its jurisdiction except Assam. The University was ranked at 29<sup>th</sup> in the ranking status of Agricultural Universities for the year 2022 by National Institutional Ranking Framework (NIRF). On the recommendations of the ICAR Peer Review Team, the National Agricultural Education Accreditation Board, ICAR, New Delhi granted accreditation for various academic programmes (UG/PG/Ph D) of the University and its constituent colleges from 28 March 2021 to 27 March 2026. Under Institutional Development Plan (IDP)-NAHEP seven campuses of the University including HQ, CAU have been converted into Solar Powered Renewable Energy Campuses.

Dr. Rajendra Prasad Central Agricultural University (DRPCAUI), Pusa was established on 7 October 2016, owes legacy of Rajendra Agricultural University, Pusa (1970) and Agricultural Research Institute and College, Pusa (1905). The University awarded degrees to 635 students including gold medals in its 3<sup>rd</sup> Convocation held on 28 February 2023 in gracious presence of Shri Narendra Singh Tomar, Former Minister of Agriculture and Farmers Welfare. The University was ranked at 10<sup>th</sup> position in the ranking status of MDRA-India Today Survey 2023 of all government general universities. The University organized the kisan mela during 23 to 25 February 2023. During kisan mela more than 7,500 farmers got benefited with new technologies. The University students have performed excellently well in academics by qualifying national and international reputed competitions and bagging number of fellowships. The University has record of 100% placement at SAB&RM, DRPCAUI in MBA programmes. On research front, the University has released four crop varieties, viz. Rajendra Ganna-6, Rajendra Ganna-7, Rajendra Chana-2 and Rajendra Chana-3 and one of sugarcane variety, viz Rajendra Ganna-5 through Central Variety Release Committee (CVRC). The University has been granted seven patents.

The Rani Lakshmi Bai Central Agricultural University (RLBCAU), Jhansi is the first Agricultural University in the Country, which was established as an institution of national importance by an Act of Parliament by Government of India on 5 March 2014. The University awarded degrees to 229 students including 16 gold medals to students in its 2<sup>nd</sup> Convocation held on 11 March 2023 in gracious presence of Shri Narendra Singh Tomar, Former Minister of Agriculture and Farmers Welfare. The University made stupendous progress in all the spheres of its mandated activities in academics, research and extension including infrastructure development. The University took several initiatives to foster sustained growth and quality outcomes by improving efficiency, infrastructure, instruction materials, laboratories and human resources. The University organized various trainings,

workshops, seminar and symposia programmes during the year. The University has developed “Bundeli Krishi Vipnan” Mobile App and also developed AI-DISC Android Mobile App and launched during the year in collaboration with ICAR-IASRI under NIBPP Mobile App-NAHEP comp-2. The University has signed MoUs with different Institutes/Organization to facilitate the exchange of knowledge, expertise, and resources between the two institutions, fostering a synergistic environment for academic and research activities. The University has organized major events/outreach programmes like: Atal Jai Vigyan Lecture Series, Kisan Mela-2023 and Bundelkhand Agri-export Promotion Summit-2023 during the year.

Agricultural Scientists Recruitment Board (ASRB) plays a key role in recruitment of best quality scientists and other management personnel for ICAR and its research institutes across the country. In addition, the Board aids and advise the Council in evolving and implementing policies related to induction of human resource and its development including the Career Advancement Schemes for ARS Scientists. ASRB has consistently been endeavouring to reform and refine talent-search strategies to meet existing as well as emerging needs of the National Agricultural Research and Education System (NARES). In its endeavour to recruit best talented human resources as per need of time, ASRB has undertaken several reforms in recruitment process. Selection criteria (scorecard) for selection of Research Management Positions (RMP) and Non-RMP positions have been revised from time to time to make it more objective and transparent. Latest IT tools have been employed to facilitate online submission of applications and fees by the applicants. NET certificates have been distributed and uploaded on Digi locker to access the certificates online and many more. During the year, the Board successfully concluded the interview process for a total of 451 posts. During the period, the Board released four advertisements for direct recruitment of 790 RMP and Non-RMP posts. These positions included Assistant Directors General, Directors of National Institutes, Joint Directors of National Institutes, Project Coordinators, Heads of Division/Heads of Regional Stations, Senior Scientists cum Heads of KVKs and Senior Scientists. The Agricultural Research Service (Main) examination was held on 28 November 2021 and Viva-voce was conducted from 9 December, 2022 to 20 December 2022. Out of the 222 advertised vacancies a total of 208 candidates across 47 disciplines were recommended for entry-level scientific posts under ICAR during the year. The promotions under Career Advancement Scheme (CAS) for ARS Scientists were carried out well within the time frame as per schedule of the Board.

Agrinovate India Ltd. (AgIn), a Government of India enterprise, was incorporated under the Companies Act, 1956 (No. 1 of 1956) on 19 October 2011 and owned by Department of Agricultural Research and Education (DARE). It works as an important interface between the research institutes and the Agri-industry and promotes technology commercialisation through licensing for domestic and international clients. With standardized protocols, Agrinovate India Ltd has helped several ICAR institutions, industries and farmers as end stakeholders by transferring around 123 technologies during the financial year 2022-23. The Company has significantly increased its gross revenue during the period from operations touched ₹ 10.01 crores (excluding taxes and including royalty of ₹ 43 lacs).

This Annual Report shows government’s dedicated efforts for augmenting the production and productivity in agriculture for the benefit of citizens including farmers of the country. I hope this report will be useful for all concerned with agricultural research and education.

**(Arjun Munda)**

Minister of Agriculture and Farmers Welfare  
Krishi Bhawan, New Delhi 110 001

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01

# OVERVIEW



## Department of Agricultural Research and Education (DARE)

The Department of Agricultural Research and Education (DARE) was established in the Ministry of Agriculture in December 1973. DARE coordinates and promotes agricultural research, education and extension in the country. DARE consists of four autonomous bodies under its administrative control:

1. Indian Council of Agricultural Research (ICAR), New Delhi
2. Central Agricultural University (CAU), Imphal
3. Dr Rajendra Prasad Central Agricultural University, Pusa, Bihar
4. Rani Lakshmi Bai Central Agricultural University, Jhansi, UP

DARE provides the necessary government linkages for the Indian Council of Agricultural Research (ICAR), the premier research organisation, for co-ordinating, guiding and managing research, education and extension in agriculture including horticulture, fisheries and animal sciences in the entire country.

Besides these, it has Agricultural Scientists Recruitment Board (ASRB) as attached office and Agrinnovate India Limited (AgIn), a Government of India enterprise under its control.

The salient achievements for the period from 1 October 2022 to 30 September 2023 are enumerated as below.

### Indian Council of Agricultural Research (ICAR)

ICAR ensures that the groundbreaking discoveries and technologies to reach our farmers, producers and consumers. ICAR solves societal challenges through collaboration with other partners, including academic and science organizations; small business and industry; agencies from all levels of government; and non-governmental, public, and private organizations. ICAR continued strong collaboration with other agencies to become more efficient and competitive, to sustain natural resources and the environment, to enhance the sustenance of food supply and improve nutrition. ICAR is working towards self-reliant agriculture and fulfilling ICAR's strategic objectives to ensure the agricultural and rural prosperity. ICAR has focused on different aspects of agricultural research such as food system transformation, food, nutrition and

human health promotion, climate and energy needs; sustainable use of natural resources; food safety; small business innovation and product development; agricultural education and workforce development. ICAR has played a major role in promoting excellence in higher education in agriculture and coordinating education in all state agricultural universities and central agricultural universities. ICAR vigorously pursued the deployment of digital platforms in agriculture and the application of ICT for farmers' empowerment.

ICAR's commitment to food security is evident in the development of 283 varieties of food-grains and 99 varieties of horticulture crops, including 35 bio-fortified varieties and 32 varieties to combat the various abiotic stresses like drought, water scarcity, flood, waterlogging, salinity, sodicity, low temperature etc. By optimizing agricultural production and resource management, these efforts promise to usher in an era of sustainability and resilience in Indian agriculture. The establishment of fertigation schedules for 24 crops is a leap forward in nutrient management promising enhanced crop productivity. ICAR's development of 28 new equipment and machineries is a giant stride towards the mechanization and modernization of agricultural practices. The establishment of breeding protocols for new fish breeds is a significant contribution to the aquaculture and fish production sector. ICAR's forward-thinking approach promises to elevate fisheries to new heights, ensuring a sustainable and thriving industry. ICAR's foray into robotics research is a pioneering move that is set to revolutionize agriculture. By pushing the boundaries of robotics in farming practices, ICAR is not only embracing innovation but also paving the way for a future where technology plays a pivotal role in sustainable agriculture. ICAR's dedication to the grassroots is evident in the extensive 47,088 on-farm trials and 2.99 lakh frontline demonstrations. These initiatives bridge the gap between scientific advancements and on-field application, ensuring that farmers across the nation can adopt innovative practices seamlessly.

### Central Agricultural University (CAU), Imphal

Central Agricultural University (CAU), Imphal was established in the year 1993 under the Central

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Agricultural University Act, 1992 of the parliament (Act No. 40 of 1992) which came into effect on 26 January 1993. The University became functional with the joining of first Vice-Chancellor on 13 September 1993. The jurisdiction of the University extends to seven North Eastern Hill States such as Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Sikkim, Nagaland and Tripura with Headquarters at Imphal in Manipur.

During the period, a total of 564, 232 and 55 students were admitted in various Under-graduates, Masters and Ph D programmes, respectively during the academic year 2023-24. A total of 424 UG and 202 PG students completed the degrees and 28 students were also awarded Ph D during the period. The students of the University performed well at national level competitive examinations. The University has an exemplary record of placement in a number of private and public sector organizations, government undertakings, etc. A total of 195 students were placed during the period in various capacities in different organizations. During the year, University carried out 25 Intramural Research Projects (IPRs) and 102 Externally-funded Research Projects. A database of 303 rare and endemic fish species in NE water bodies was developed, whereas 182 fish species were bar-coded. A Mini Fish Smoking kiln of 10 kg capacity and low cost pabda hatchery were developed. A total of 465 trainings, workshops, conferences, seminars, summer schools were organized at different constituent colleges of the University. Among faculty members 41 were deputed for participation in international conference and seminars, 44 for national conferences and seminar, 24 for workshops, 13 for long term training courses and 30 for short term training programmes. A total of 62 students from 10 colleges of the University and 19 faculties of the University were deputed for foreign training in reputed institutions.

### **Dr. Rajendra Prasad Central Agricultural University (DRPCA), Pusa**

Dr. Rajendra Prasad Central Agricultural University, Pusa was established on 7 October 2016. In its archive, the University owes legacy to Rajendra Agricultural University, Pusa established in 1970 and to the Agricultural Research Institute and College, Pusa established in 1905.

During the 3<sup>rd</sup> convocation of the University held on 28 February 2023, a total of 242 UG, 371 PG and

22 Ph D students were awarded degrees along with gold medals to university toppers. The University was ranked at 10<sup>th</sup> position in the ranking status of MDRA-India Today Survey 2023 of all government general universities. The University organized the Kisan Mela during 23 to 25 February 2023 on the theme “Natural Farming and Nutri-Cereal Cultivation for Farmers Prosperity. During the Kisan Mela more than 7,500 farmers got benefited with new technology. The University students have performed excellently well in academics by qualifying reputed national and international competitions and bagging number of fellowships.

### **Rani Lakshmi Bai Central Agricultural University (RLBCAU), Jhansi**

The Rani Lakshmi Bai Central Agricultural University (RLBCAU), Jhansi is the first Agricultural University in the Country, which was established as an institution of national importance by an Act of Parliament by Government of India on 5 March 2014.

The University made stupendous growth in all the spheres of its mandated activities in academics, research and extension education including infrastructure development. The University took several initiatives to foster sustained growth and quality outcomes by improving efficiency, infrastructure, instruction materials, laboratories and human resources. During the 2<sup>nd</sup> convocation of the University held on the 11 March 2023, total 213 students were conferred Undergraduate and Postgraduate degrees. Also 16 students were awarded with gold medals for being university toppers in different course programmes. The University organized trainings, workshops, seminars and symposia during the year. The University has developed “Bundeli Krishi Vipnan” mobile App and also developed AI-DISC Android Mobile App and launched during the year in collaboration with ICAR-IASRI under NIBPP Mobile App-NAHEP Comp-2. The University has signed MoUs with different Institutes/Organizations to facilitate the exchange of knowledge, expertise, resources and fostering a synergistic environment for academic and research activities. The University organized major events/outreach programmes such as Atal Jai Vigyan Lecture Series, Kisan Mela-2023 and Bundelkhand Agri-export Promotion Summit-2023 during the year.

## Agricultural Scientists Recruitment Board (ASRB)

The Agricultural Scientists Recruitment Board (ASRB) was established with the approval of Cabinet on 1 November 1973 as an independent recruitment agency in pursuance of the recommendations of the Gajendragadkar Committee. The Government of India has approved restructuring of the Board in the meeting of the Union Cabinet held on 1 August 2018. The decision has been formally notified in the GOI Gazette on 9 August 2018.

During the period, the Board released four advertisements for direct recruitment of 790 Research Management Position (RMP) and Non-RMP posts. Based on the result of ARS (Preliminary) Examination, a total of 2,792 candidates qualified for the ARS main examination, out of which only 2,437 candidates actually appeared in the ARS main examination. The Agricultural Research Service (Main) examination conducted by ASRB on 28 November 2021 followed by Viva-voce held from 9 to 20 December 2022. As a result of this process, a total of 208 candidates across 47 disciplines have been recommended for entry-level scientific posts under ICAR. The Board successfully concluded the interview process for a total 451 posts. These positions included one Deputy Director General, 19 Assistant Directors General, 68 Directors, Two Project Directors, 18 Joint Directors, 17 Project Coordinators, 280 Heads of Division/Heads of Regional Station and 38 Senior Scientists cum Heads of Krishi Vigyan Kendra's (KVKs).

## Agrinnovate India Ltd. (AgIn)

Agrinnovate India Ltd. (AgIn), a Government of India enterprise, was incorporated under the Companies Act, 1956 (No. 1 of 1956) on 19 October 2011 and owned by Department of Agricultural Research and Education (DARE), Ministry of Agriculture, Government of India. Agrinnovate India Limited (AgIn), a Government of India enterprise, is steadily moving towards fulfilling its objective of stimulating and fostering innovations in agriculture and building 'A World of Innovative Partnerships'. It works as an important interface between the research institutes and the agri-industry and promotes technology commercialisation through licensing for domestic and international clients. The Company has significantly increased

its gross revenue during the period from operations touched ₹ 10.01 crores (excluding taxes and including royalty of ₹ 43 lacs). These technologies emerged from crop sciences (12.49%), dairy and veterinary sciences (64.27%), horticulture (20.47%) and fisheries (2.76%). AgIn and team resulted in widely expanding the business opportunities for the Company and more than 600 technologies from 59 institutes and 4 universities have been added to the list of technologies ready for commercialization through Agrinnovate. With standardized protocols, AgIn has helped several ICAR institutions, industries and farmers as end stakeholders by transferring around 123 technologies during the financial year 2022-23.

## Consultative Group on International Agricultural Research (CGIAR)

Consultative Group on International Agricultural Research (CGIAR) is a global partnership that unites international organizations engaged in research for a food security in future and dedicated to reducing rural poverty, increasing food security, improving human health and nutrition and ensuring sustainable management of natural resources. India is a donor member CGIAR from decades and also a permanent voting member in CGIAR System representing South Asia Constituency along with two alternates partner countries, viz. Bangladesh and Sri Lanka. Now, the CGIAR is going through a transition/change process and research will now be grouped in different initiatives under the One CGIAR. The new initiatives will work on identified areas, bringing together relevant CG Centres and the global demand, innovation and scaling partners.

## Major Activities

### Work Plan

- Work Plan was signed on 13 December 2022 for the period 2022-2027 between Indian Council of Agricultural Research (ICAR) and International Potato Center (CIP) under the memorandum of agreement on cooperation to develop, promote and accelerate close collaborative efforts for development of agriculture research and education.
- Work Plan was signed on 24 April 2023 for the period 2022-2026 between Indian Council of Agricultural Research (ICAR), Department of

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Agricultural Research and Education (DARE) and International Water Management Institute (IWMI) under the memorandum of agreement on cooperation to develop, promote and accelerate close collaborative efforts in the fields of water management research.

- Work Plan was signed on 28 November 2022 for the period 2022/23-2026/27 between Indian Council of Agricultural Research (ICAR), Department of Agricultural Research and Education (DARE) and International Centre for Agricultural Research in the Dry Areas (ICARDA) under the memorandum of agreement to develop, promote and accelerate close linkages and collaborative efforts for agriculture research.
- Work Plan was signed on 28 November 2022 for the period 2022/23-2026/27 between Indian Council of Agricultural Research (ICAR) and International Livestock Research Institute (ILRI) under the memorandum of agreement to develop, promote and accelerate close collaborative efforts in the field of livestock research.

### Projects processed for approval in collaboration with ICAR Institutes

- Collaborative Research Project proposal entitled “The South Asia Agriculture Adaptation Atlas: Interconnections between Climate Risks, Practices, Technologies, and Policies” for the period of three years.
- Collaborative Research Project entitled “Physiological basis of amelioration of heat stress through nitrogen management in wheat” submitted by ICAR-IARI, New Delhi in collaboration with International Maize and Wheat Improvement Center (CIMMYT), Mexico for a period of three years.
- Collaborative research project entitled “Development and validation of Integrated Pest Management (IPM) modules to tackle fall

armyworm *Spodoptera frugiperda* infestation in maize” to be funded by International Maize and Wheat Improvement Centre (CIMMYT), Nairobi, Kenya, submitted by ICAR-Indian Institute of Maize Research (ICAR-IIMR), Ludhiana.

### Foreign visits

- Dr. Himanshu Pathak, Secretary, DARE and Director General, ICAR participated in the 38<sup>th</sup> South Asian Association for Regional Cooperation (SAARC) charter day as a keynote speaker in Dhaka, Bangladesh on 8 December 2022.
- Dr. Himanshu Pathak, Secretary, DARE and Director General, ICAR participated in the ICAR-IWMI Steering Committee Meeting during 21-23 April 2023 at Colombo, Sri Lanka.
- Dr. Himanshu Pathak, Secretary, DARE and Director General, ICAR participated in the CGIAR System Council meeting held in Washington DC, USA during 10-12 May 2023.

The ICAR has played a pivotal role in making agriculture sustainable through use of eco-friendly management and innovative technologies which helped the country to enhance the production of food grains, horticultural crops, milk, fish and eggs. This has enabled the nation not only to be food and nutrition secure but also improved livelihood of the farmers.

**(Himanshu Pathak)**

Secretary, Department of Agricultural Research  
& Education and Director General,  
Indian Council of Agricultural Research  
New Delhi









02

**BODIES UNDER  
DARE AND THEIR  
ACTIVITIES**

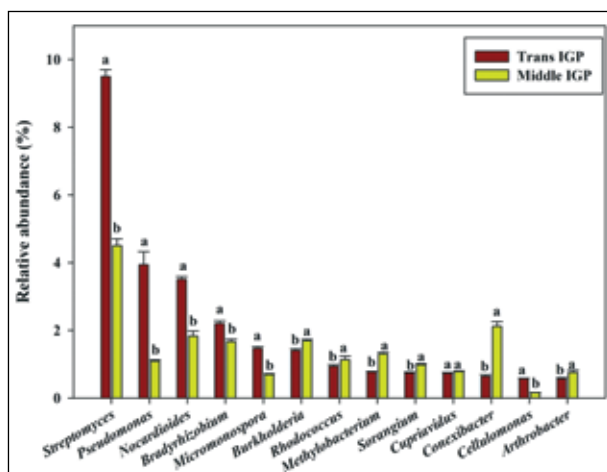
## INDIAN COUNCIL OF AGRICULTURAL RESEARCH (ICAR)

The accomplishments and progress towards achieving the strategic objectives, key performance indicators (KPIs) and outcome framework articulated during the year are presented. ICAR ensures that the groundbreaking discoveries and technologies to reach our farmers, producers and consumers. ICAR solves societal challenges through collaboration with other partners, including academic and science organizations; small business and industry; agencies from all levels of government; and non-governmental, public, and private organizations. ICAR continued strong collaboration with other agencies to become more efficient and competitive, to sustain natural resources and the environment, to enhance the sustenance of food supply and improve nutrition. ICAR is working towards self-reliant agriculture and fulfilling ICAR's strategic objectives to ensure the agricultural and rural prosperity. ICAR has focused on different aspects of agricultural research such as food system transformation, food, nutrition and human health promotion, climate and energy needs; sustainable use of natural resources; food safety; small business innovation and product development; agricultural education and workforce development. ICAR has played a major role in promoting excellence in higher education in agriculture and coordinating education in all state agricultural universities and central agricultural universities. ICAR vigorously pursued the deployment of digital platforms in agriculture and the application of ICT for farmers' empowerment.

ICAR's commitment to food security is evident in the development of 283 varieties of food-grains and 99 varieties of horticulture crops, including 35 bio-fortified varieties. By optimizing agricultural production and resource management, these efforts promise to usher in an era of sustainability and resilience in Indian agriculture. The establishment of fertigation schedules for 24 crops is a leap forward in nutrient management promising enhanced crop productivity. ICAR's development of 28 new equipment and machineries is a giant stride towards the mechanization and modernization of agricultural practices. The establishment of breeding protocols for new fish breeds is a significant contribution to the aquaculture and fish production sector. ICAR's forward-thinking approach promises to elevate fisheries to new heights, ensuring a sustainable and thriving industry. ICAR's foray

into robotics research is a pioneering move that is set to revolutionize agriculture. By pushing the boundaries of robotics in farming practices, ICAR is not only embracing innovation but also paving the way for a future where technology plays a pivotal role in sustainable agriculture. ICAR's dedication to the grassroots is evident in the extensive 47,088 on-farm trials and 2.99 lakh frontline demonstrations. These initiatives bridge the gap between scientific advancements and on-field application, ensuring that farmers across the nation can adopt innovative practices seamlessly. The salient achievements of the Council during 2023-24 are enumerated below.

**Crop Improvement:** During the year, a total of 283 varieties/hybrids have been notified and released for commercial cultivation, which include 35 biofortified varieties and 32 varieties to combat the various abiotic stresses like drought, water scarcity, flood, waterlogging, salinity, sodicity, low temperature etc. Use of precision breeding tools, i.e. marker assisted selection has also been done in breeding 10 traits specific varieties. The breakup of different varieties developed is given below. One hundred and twenty-five high yielding varieties/hybrids of cereals comprising 47 of rice, 21 of maize, 24 of wheat, 9 of sorghum, 4 of pearl millet, 6 of little millet, 5 of finger millet, 3 of proso millet, 2 each of kodo millet and foxtail millet, one each of brown top millet and barnyard millet were released for cultivation in different agro-ecologies of the country. Similarly fifty two high yielding oilseeds varieties comprising 13 of Indian mustard, 10 of soybean, 7 of linseed, 8 of groundnut, 5 of sesame, 3 of safflower, 2 each of sunflower and gobhi sarson and 1 each of niger and yellow sarson were released for different agro-ecological regions. Fifty-nine high-yielding varieties of pulses comprising 15 of urdbean, 13 of chickpea, 8 of mungbean, 6 each of pigeonpea and field pea, 4 each of cowpea and lentil, 2 of rajmash and one of cluster bean were released. Twenty-nine high-yielding varieties/hybrids of commercial crops including 13 of cotton, 11 of sugarcane, 2 of jute and 1 each of sun hemp, mesta (Roselle) and mesta (Kenaf) were released for different agro-ecological regions. Likewise, eighteen high yielding varieties/hybrids of forage and other crops comprising 2 of forage oats, 3 of forage pearl millet, 10 of forage sorghum and 1 each of forage cowpea, Dinanath grass and grain amaranth were released for cultivation in different



Core rhizosphere microbiome of wheat growing in Indo-Gangetic Plains.

agro-ecologies. Maleic enzyme (ME)-transgenic lines showed reduced leaf malate content and enhanced photosynthesis performance under water deficit conditions. Plants depend on the rhizospheric microbiome for nutrient uptake, and environmental stress alleviation. A small subset of the rhizospheric microbiome called the core microbiota constitutes a specific set of microbial communities that are consistently associated with the plant species. A total of 186 taxa were identified as core microbiota of wheat rhizosphere in middle IGP, and 163 taxa were identified as core microbiota in trans-IGP.

In horticulture, a total of 99 varieties have been developed. Twelve new varieties of fruit and plantation crops, viz avocado, custard apple,



Arka Dhriti F1 hybrid of chilli



Arka Nihira F1 hybrid of chilli

bael, tamarind, coconut, cocoa and cashew were identified and released for cultivation. In vegetable crops, varieties of chilli, faba bean, okra, pointed gourd, winged bean, water spinach, palak or spinach beet, radish, brinjal, tomato, amaranth, watermelon, long melon, round melon, bottle gourd, bitter gourd, garden pea, spine gourd, drumstick, Indian bean (sem), yard long bean, ridge gourd, potato and tuber crops having high yield potential and tolerant to biotic and abiotic stresses were released. In spices, varieties of black pepper, ginger, small cardamom, dill and star anise were developed. High yielding varieties were identified in flowers (9), medicinal plants (1) and mushrooms (3).

**Livestock Improvement:** India's first cloned cow (named Ganga) was born, showcasing the feasibility of cattle cloning in India. Gir cattle, known for their hardiness and disease resistance, are popular globally. This achievement opens new avenues for India's dairy sector, offering advanced reproductive technologies to produce high-quality indigenous dairy animals. A total of 36,270 doses of Sahiwal breed were frozen, and 11,520 doses were utilized for breeding. Through the interventions of Field Progeny Testing programme, the average first lactation 305-day milk yield in adopted villages has been increased. ICAR-Central Institute for Research on Buffaloes (ICAR-CIRB), Hisar has successfully generated a male buffalo calf named "Veer Gaurav"



Male buffalo calf 'Veer Gaurav' produced using OPU-IVEP technology at ICAR-CIRB, Hisar.

utilizing the cutting-edge Ovum Pick Up and *In-Vitro* Embryo Production (OPU-IVEP) Technology.

The analysis of data on growth and prolificacy traits of *inter-se* mated Avishaan sheep over the four generations revealed that the prolificacy in



Avishaan sheep over the four generations ranged from 59.5 to 71.4% with litter size from 1.66 to 1.81 at birth. During the year, a total of 5,85,374 chicken germplasm was distributed to 4,819 farmers/beneficiaries from different centres. A total of 3,58,588 improved chicken varieties have been distributed by the Poultry Seed Project centres in their respective regions/states. Next-generation sequencing technology was utilized to sequence the genome of the Kadambri variety of Guinea fowl with 20X coverage in an Illumina platform (150bp paired end reads).

**Fish Improvement:** Successful induced breeding was achieved in captivity in >2 years matured male and female fishes of goldlined



Maldives damselfish (*Amblyglyphidodon indicus*)



Caerulean damselfish (*Pomacentrus caeruleus*)



Black bar chromis (*Pycnochromis retrofasciatus*)

seabream (*Rhabdosargus sarba*), a euryhaline species, during second week of December 2022. Standardized the induced breeding and seed production technology of *Hypselobarbus kolus*, an indigenous Peninsular carp. The breeding technologies of 3 marine ornamental fishes, viz. black bar chromis (*Pycnochromis retrofasciatus*), caerulean damselfish (*Pomacentrus caeruleus*) and Maldives damselfish (*Amblyglyphidodon indicus*) including protocols of broodstock development, breeding, and larval rearing were achieved.

ICAR-CIFA, Bhubaneswar imparted hands-on training and technical guidance to farmers from across the country on catfish broodstock management, induced breeding, hatchery management, seed production and live feed culture. After obtaining training, the 3 fish farmers successfully established catfish hatchery and produced catfish seeds. ICAR-NBFGR created sustainable livelihood opportunities for the women of Lakshadweep Islands by establishing a marine ornamental aquatic organisms germplasm resource centre at Agatti island for propagation of indigenous marine ornamental shrimps/fishes. Training was provided to the self-help group clusters, and the community aquaculture units are being successfully operated for rearing ornamental shrimps and fishes.

**Genetic Resources:** A total of 4,246 accessions of orthodox seed species were added to the National Genebank for long-term storage, bringing the base collection of National Genebank to the total of 4,67,254 accessions. A total of 39 accessions of fruits, tubers, bulbs and medicinal plants were added to the *in vitro* Genebank, making the total collection of 2,001 accessions in the form of ~40000 *in vitro* cultures of 68 genera and 167 species. In the Cryogenebank, 378 accessions of seeds and pollen genomic resources of different crop species were successfully cryopreserved, making the total collection of 12,858 accessions belonging to 885 species, besides 2,194 genomic resources. Dr Himanshu Pathak, Secretary (DARE) and DG (ICAR) visited the National GeneBank and *in vitro* culture facility of ICAR-NBPGR on 14 August 2023 and interacted with the scientists. A total of 29,706 accessions of various agri-horticultural crops comprising chickpea (5,084), linseed (2,576), wheat (2,534), chilli (1,100), wild *Cicer* (513), rapeseed and mustard (402), maize (244), yard long bean (210), and other crops (572) were characterized/evaluated for various traits. Core set was developed in linseed comprised 259 accessions. Unique accessions such as pea germplasm (IC220286) with waxiness,

prolific maize accessions (KG/VK/SKT-222), pre-harvest sprouting tolerant blackgram accessions (IC485425 and IC250220), chilli accession (EC769427) with 12 flowers per inflorescence were identified. National Agriculturally Important Microbial Culture Collection (NAIMCC) currently holds 7,866 microbial accessions, which include fungi (4,339), bacteria and actinomycetes (3,161), and cyanobacteria (366). The culture collection has received 14 new microbial genera. ICAR-NBAIR Museum has been designated by the Ministry of Environment and Forests and Climate Change as the “National Repository” under the Biological Diversity Act, 2002 for agriculturally important insects, mites and spiders. The National Insect Museum now holds around 2.40 lakh specimens with addition of 4,786 insect specimens.

A total of 1,053 germplasms of different horticultural crops including fruit crops (248), flowers and other ornamental plants (271), vegetables (525) and medicinal and aromatic plants (38) were collected. In addition to above, a total of 90 accessions of vegetable germplasm (cultivated and wild relatives of *Luffa* sp, *Abelmoschus* sp, *Trichosanthes* sp and *Cucumis* spp) were collected from the Sundargarh district of Odisha. In addition to the cultivated germplasm, a total of 83 germplasms of vegetables belonging to 42 species of different crops including 30 species of wild relatives were collected. Herbarium specimens (20) were also deposited in National Herbarium of Cultivated Plants (NHCP), ICAR-NBPGR, New Delhi. A total of 1,081 location specific collections of mushroom strains were also collected, of which 333 specimens/cultures were deposited at the ICAR-DMR Gene Bank with passport data and accession numbers were given to 92 cultures. A total 15 germplasms have been registered at ICAR-NBPGR, New Delhi for different unique traits in fruits, vegetable, flowers and medicinal and aromatic plants.

Ten registered breeds of livestock were Gazette notified. These breeds included Kathani (Maharashtra), Sanchori (Rajasthan), Masilum (Meghalaya) cattle; Purnathadi buffalo (Maharashtra); Sojat (Rajasthan), Karauli (Rajasthan) and Gujari (Rajasthan) goat and Banda (Jharkhand), Manipur Black (Manipur), Wak Chambil (Meghalaya) pig. After including these breeds, a total of 212 indigenous breeds (53 of cattle, 20 of buffalo, 37 of goat, 44 of sheep, 7 of horses and ponies, 9 of camel, 13 of pig, 3 of donkey, 3 of dog, 1 of yak, 19 of chicken, 2 of duck and 1 of geese) have been notified by the Government,

till date. ICAR-NBAGR in August 2021 initiated a mission approach for identifying new homogenous population in various states through institute projects and 40 new potential populations have been identified till now since initiation of mission activities. During the period, 18,050 semen doses of 4 cattle breeds (Malnad Gidda, Hariana, Gir, Gangatiri); 3 buffalo breeds (Nili Ravi, Mehsana, Surti) and 2 goat breeds (Osmanabadi, Sangamneri) have been cryopreserved. Also, 2,240 somatic cell vials of 19 native breeds– Ladakhi, Siri and Sahiwal cattle; Changthangi, Bhakarwali, Gaddi and Teressa goat; Gurez, Bonpala, Karnah and Gaddi sheep; Agonda Goan, Wak Chambil, Niang Megha, Mali, Banda and Nicobari pig; Mewati camel and Kathiawadi horse were cryopreserved for long term conservation. At present, National Gene Bank has repository of 61 native breeds/populations of livestock and poultry in form of Semen and 47 in form of Somatic cells. Further, 122 oocytes (vitrified) of 5 native breeds were also cryopreserved.

ICAR-NBFGR discovered new fish and shrimp species from marine waters along the coast of Tamil Nadu, Kerala and Lakshadweep islands. Marine fish species discovered were *Gymnothorax tamilnaduensis*, *Conger melanopterus*, *Rhynchoconger bicoloratus*, *Ophichthus nigroventralis* and *Macrocephenchelys sumodi*. Marine shrimps detected were *Cuapetes purushothamani* and *Alpheus sulcipalma*. Mangrove red snapper, *Lutjanusargenti maculatus*, a marine food fish of economic and aquaculture importance was found to comprise genome of 1.04 Gb length containing 521 scaffolds with N50 metric of 32.5 Mb. The mangrove red snapper genome has been predicted to contain 31,969 protein encoding genes. Decoded the whole genome of Indian oil sardine (*Sardinella longiceps*), a popular marine food fish. The decoded genome is 1.077 Gb in size and contains 46,316 protein coding genes. Genetic and genomic investigations showed that Indian oil sardines exist in two highly distinct stocks, one in the Indian waters and another in the Gulf of Oman. National Fish Museum and Repository established at the ICAR-NBFGR, Lucknow, was dedicated to the nation on 14 April 2023. The newly developed museum displays finfish and shellfish voucher specimens of freshwater, marine, and brackish water environments. The museum also holds a radiographic facility to comprehensively understand fish morphological feature. National Repository of Fish Cell lines with 81 cell line accessions is also located in this museum.



**Crop Management:** Legume integration with cereal proves superiority. Temporal integration of maize+blackgram (raised bed) + soybean (furrow)-chickpea (raised bed) + wheat (furrow) (3:2)-greengram (raised bed) + sunflower (furrow) (5:1) was found economically feasible by recording higher productive efficiency (175%) concerning maize-wheat systems with the lowest greenhouse gasses intensity (GHGI). An IFS model (1-acre area) consisting of polyhouse cultivation of vegetables (600 m<sup>2</sup> area for cultivation of tomato, capsicum, and cucumbers), mushroom production (50 m<sup>2</sup> area), agri-horti system (1,200 m<sup>2</sup> area), apiculture and open field cultivation of vegetables, flowers, cereals, oilseeds and pulses on 2,200 m<sup>2</sup> area was developed for small and marginal farmers. The IFS model is economically efficient and environmentally robust and has the potential to generate a net income of ₹ 1,75,650 per year. A sugarcane cultivation model combining nine improved sugarcane cultivation practices named as Sugarcane Settling Transplanting Technology (STT) was established at ICAR-Sugarcane Breeding institute, Coimbatore.



Sugarcane settling transplanting

Four full length *vip3*-type genes *vip3Aa44*, *vip3Aa67*, *vip3Aa69* and *vip3Aa70* (NCBI GenBank Accession Numbers HQ650163, MN120477, MN120479 and MN120481 respectively) were isolated from *Bt* subsp *thuringiensis* (A6) and *Bt* isolates SK-792, SK-986 and SK-851, recovered from diverse habitats in India. These *vip3Aa* genes have potential for lepidopteran pest control. A pool of 373 entopathogenic fungal isolates (EPFs) was evaluated for their bioefficacy against whitefly (*Bemisia tabaci*) under polyhouse. Overall, EPF strains *Beauveria bassiana* (Bb)-4511, *Cordyceps javanica* (Cj)-102, and *Metarhizium anisopliae* (Ma)-1299, were found compatible with full and half doses of the chemical and botanicals and showed highest nymphal mortality (80-95%). A Systemic Acquired Resistance (SAR) inducer molecule was developed as coated nano formulation

for smart delivery in plants, for prolonged release and tested for its plant immune inducer property in field against red rot, smut and wilt diseases of sugarcane. In field experiments, application of nano formulation significantly reduced red rot, smut and wilt incidences by 79.4%, 80.8% and 75.8%, respectively over pathogen inoculated control.

The mango-based cropping system with dragon fruit and pineapple as component crops exhibited higher production efficiency (85.21 kg/day/ha), economic efficiency and sustainable yield index under Bhubaneswar conditions. Spray schedule for flower/fruit drop in pomegranate was standardized. An integrated nutrient management schedule in sweet orange was standardized. Integration of coconut with pasture crops (Cumbu Napier hybrid + *Desmanthus*), fodder trees (*Sesbania grandiflora* + *Leucaena leucocephala* + *Glyricidia*) and Tellicherry breed of goats recorded net income of ₹ 2,54,206/ha with BC ratio of 3.16 as compared to ₹ 1,51,312/ha with BC ratio of 2.25 in the monocrop of coconut. "Onion Crop Advisor" mobile application—a comprehensive tool was designed and developed. Three chrysanthemum genotypes, viz. OPCH 12-7; OPCH Double White and DFR C-2 identified as highly attractive, floriferous and rewarding genotypes for honeybees. The genotypes can be used for preparation of floral calendars to improve pollinator's health and habitat restoration. Technology for the Vitamin D enrichment of *Hypsizygus ulmarius* (Elm oyster) mushroom was developed.

An algorithm based on object detection approach with an accuracy of 84.3% for surveillance of rhinoceros beetle infestation in coconut using unmanned aerial vehicle (UAV) has been developed. A total of 67 species were documented on cashew inflorescences. Damage symptoms, seasonal incidence and influence of weather factor on pests, natural enemies for different pests were also documented. Reduction in nut set up to 47.06 % has been recorded in NRCC Sel-2 due to damage by the inflorescence pests. A technology for the management of the beetle *Lanka ramakrishnai* with low-risk insecticides has been developed. Three rounds of spray application with chlorantraniliprole 18.5% SC at 0.3–0.5 ml/l of water during July– September has been found effective for the management of this pest in black pepper. BSV free (episomal BSMYV) tissue culture banana cv. Poovan revealed that use of virus free tissue cultured elite Poovan clone significantly reduce incidence of streak disease and increase

yield over local Poovan in Karnataka, Kerala, Odisha, Maharashtra, Tamil Nadu and West Bengal. The disease reduction is to a tune of 56-75% and yield enhancement is to a tune of 23-28% with a B:C ratio of 1.51 to 1.89. *In-vitro* compatibility analysis showed that *Trichoderma afroharzianum* was compatible to azoxystrobin, kresoxim methyl, meptyldinocap, fluxapyroxad and pyraclostrobin and formulations of sulphur. The field evaluation for compatibility of biocontrol agents with registered fungicides in controlling the powdery mildew of grapes revealed that the *Trichoderma asperelloides* alternated with azoxystrobin, kresoxim methyl, meptyldinocap, fluxapyroxad + pyraclostrobin and sulphur was effective against powdery mildew. An integrated management schedule for management of blight and aphids in cumin. Three foliar sprays of kresoxym methyl 44.3 SC @ 0.044% (First with initiation of disease and subsequently at 15 days interval) and two foliar sprays of thiamethoxam 25WG @ 0.0084% (First with the initiation of aphid infestation and the second after 10 days) were found effective for obtaining a higher yield (677 kg/ha) and incremental benefit-cost ratio (1.98) with less blight(PDI=16.06%) and aphid incidence (Aphid Index=0.96) under Jagudan (Gujarat) conditions.

**Livestock Management:** A total number of 74,582 serum samples from various NADEN units and State Animal Husbandry Departments were screened for major livestock diseases for sero surveillance and recommendations were provided to the state governments. A total of 517 samples were analyzed for AMR pathogens (MRSA, ESBLs) and the prevalence of antimicrobial resistance was documented from livestock, environment and humans. The whole genome sequencing (WGS) of bacterial (n=1458) isolates for AMR surveillance was carried out. Complete genome sequence of 12 H5N1 highly pathogenic avian influenza (HPAI) viruses (2 from Bihar, 1 from Jharkhand and 7 from Kerala) isolated from chickens, ducks, quails and wild birds during October 2022 to April 2023 in different epicentres was determined. Under FMD sero-surveillance, 72,308 bovine serum samples collected across the country were analyzed using the r3AB3 NSP-ELISA (DIVA) to determine the apparent prevalence of NSP-antibody (NSP-Ab) in the bovine population. For Post Vaccination sero monitoring, a total of 92,306 serum samples were examined using Solid Phase Competitive ELISA (SPCE) under NADCP to assess the efficiency of immunization. A competitive ELISA kit for detection of bovine viral diarrhoea (BVD) p80 antibodies has

been developed which is intended for serological diagnosis of BVD in cattle. It is based on the recombinant NS3 antigen of an Indian BVDV-1 isolate and anti-NS3 monoclonal antibody. A two-step CRISPR/Cas 12a based diagnostic test was developed for rapid detection of African swine fever virus in samples of porcine origin. A urine-based pregnancy diagnosis kit 'Preg-DM' was developed and validated in collaboration with ICAR-CIRB, Hisar. The kit helps to detect pregnancy as early as 30 to 35 days post breeding for achieving high lifetime productivity. A technology entitled "SARS-CoV-2 nucleic acid detection LFA kit" was released by Hon'ble Union Minister of Fisheries, Animal Husbandry and Dairying and Hon'ble Minister of State for Agriculture and Farmers Welfare and Dr Himanshu Pathak, Secretary (DARE) and DG (ICAR) on ICAR Foundation and Technology Day on 16 July, 2023.



SARS-CoV-2 nucleic acid detection LFA kit" released by Hon'ble Union Minister of Fisheries, Animal Husbandry and Dairying and Hon'ble Minister of State for Agriculture and Farmers Welfare Secretary (DARE) and DG (ICAR) was also present.

Three laboratories, Meat Species Identification (MSIL), Food Microbiology and Meat Nutrient and Residue Analytical laboratory have been accredited as per ISO/IEC 17025:2017 by National Accreditation Board for Testing and Calibration Laboratories (NABL). The AgriInnovate has commercialized the India's first Lumpy Skin Disease vaccine (Lumpi-ProVac<sup>Ind</sup>) to four major vaccine manufacturers, Biovet Pvt Ltd, Bengaluru; Indian Immunological Limited, Hyderabad; Hester Biosciences, Ahmedabad and Institute of Veterinary Biological Products, Pune. Through Embryo transfer a horse foal Raj Himani was produced using frozen semen technology and embryo transfer technology. A healthy female foal was born on 4 October 2023. The weight of the foal at birth was 35 kg. Artificial limb for large animals was designed and developed.

Patents were granted for 'Process for Improving Buffalo Sperm Viability' (Patent No. 411766);





Preparation of POP cast positive dye



HDPE



Measurement of normal limb length to assess the length of extension rod



Lateral view of designed limb prosthesis



Padding of the stump with cotton and bandages



Animal adapted with artificial limb on 10th day

Artificial limb for large animals

for “Development of a rapid user-friendly single tube tetra primer PCR based Diagnostic assay for detection of Bovine Leukocyte adhesion Deficiency carriers in cattle”; for “Recombinant Chimeric Protein for Detection of Anti-Leptospiral Antibodies and Methods Thereof” (PN- 452381 granted on 18 September 2023); and for “Recombinant non-structural proteins NS1 and NS3 as fusion protein (rNS1-NS3) based immuno-diagnostic assay for bluetongue” (PN- 419435 granted on 27 January 2023). Development of an improved *Brucella abortus* vaccine (Patent No.: 401680). Herbal product to ameliorate fluorosis in animals (Patent

No.: 416413). MoU was signed with Tirupati Tirumala Devasthanam Shri Venkateshwara Gosamrakshana Shala Trust, Tirupathi, Andhra Pradesh; ICAR- IISWC, Dehradun; ICAR-CSWRI, Avikanagar; Annasaheb Shinde Foundation (ASF); Mumbai for development and improvement of indigenous cattle breed. The copyrights on “Cattle disease diagnosis expert system – web application CaDDes” and “Epidemiological calculator (EPI CAL) Web Application” with registration numbers SW-15961/2023 and SW-16034/2023 respectively were obtained.

**Fisheries Management:** ICAR-Central Marine Fisheries Research Institute (CMFRI) provided valuable insights into the health of India’s marine fisheries. Overall, 135 marine finfish and shellfish stocks were assessed using marine fish landings and species-specific biology data from 1,168 landing centers from the Northwest, Southwest, Northeast, Southeast and Lakshadweep regions. Of the 135 fish stocks assessed (Northeast – 16, Northwest – 37, Southeast – 39, Southwest – 41, Lakshadweep – 2) in 2022, 91.1% were healthy. The report also identifies management measures that could be applied to the fish stocks/species that are of concern with regional approaches that will ensure their sustainability. ICAR-CMFRI and CSIR-Central Salt and Marine Chemical Research Institute (CSMCRI) have identified potential sites for seaweed farming in 9 coastal states and 4 Union Territories of our country. Sites identified (384) were categorized into green zones (> 1 km from CRZ-IA), amber zones (up to 1 km from CRZ-IA), and blue zones (within CRZ-IA and ESA), with 24,707 ha identified as suitable for seaweed farming. ICAR-CMFRI has brought out a document on good management practices to promote and support sustainable farming of seaweeds in India.



Seaweed farming

ICAR-CIFRI, through intensive surveys, estimated fish catch and related information from some of the major rivers. In River Mahanadi, the annual total catch was estimated to be 15,134 tonnes with catch per unit effort (CPUE) ranging between 0.18 kg and 18.88 kg/fisher/day. The 32 bacterial isolates recovered in this study were from

## BODIES UNDER DARE AND THEIR ACTIVITIES

Bacillaceae, Burkholderiaceae, Enterobacteriaceae and Aeromonadaceae families; species, viz. *Lysinibacillus fusiformis*, *L. macroides*, *Bacillus subtilis*, *B. safensis* and *Citrobacter freundii* exhibited ability to remove ammonia.

ICAR-CIFRI has developed the RiverAqua Map, a national web application, for navigating river aquatic environment based on information from primary and secondary sources. The backend water quality data comprises DO, BOD, water temperature, pH, specific conductivity, nitrate, and nitrite. All the parameters are navigable on spatio-temporal scale on 2,667 locations distributed over the Indian river system for the period from 2007 to 2020. ReportFishDisease App developed by ICAR-NBFGR, Lucknow under National Surveillance Programme for Aquatic Animal Diseases (NSPAAD) was launched on 28 June 2023. ICAR-CIFA developed a vaccine, “CIFA-brood-Vac” for vaccinating female Indian major carps and catfish brooders in order to enhance the production of disease resistant spawns up to 30%. ICAR-CIFRI developed circular HDPE cages having 16 m diameter and 5 m depth and 900 cubic meter water area. These cages were used to rear adult hilsa *Tenualosa ilisha* and Indian major carps in river Ganga. A solar powered fish feed dispenser unit was designed and built on the Internet of Things (IoT) framework with a Radiofrequency (RF) module for wireless data transmission using a single board microcontroller.



Solar-powered fish feed dispenser

**Soil and Water Productivity:** Agricultural land use plan based on the potential of soil enhances the land productivity. Based on the spatial soil information, suitability of major crops was assessed using the Analytical Hierarchical Process (AHP), to suggest a crop plan and soil-based management measures to improve land productivity within the limitations of bio-physical factors and available resources. The proposed crops are Groundnut/Cluster bean/Pulses/Pearl millet/Sorghum for Bikaner and Churu districts. Most suitable crop combinations for Sri Ganganagar are Cluster bean/Pulses/Pearl millet/Sorghum or Cotton/Groundnut/Cluster bean/Pulses. Similarly, land resource inventory at 1:10,000 scale covering the arable lands of the North and Middle Andaman district was prepared. About 2.5% of the area is under agricultural lands, 0.60% under plantation and tree clads and about 2% area is under homestead farming. Soil suitability assessment indicated that 65% area could be used to grow arecanut while 72.0% area is suitable for cultivating coconut.

Soil Saturated hydraulic conductivity map of India has been generated and represents an indicative value of Ks of the top 30 cm of the soil. The essential data for India were accessed from the International Soil Reference and Information Centre (ISRIC) soil grid data (grid size 250 m). The map shows a total of six classes having a defined range of saturated hydraulic conductivity presented in millimeter per hour.

Analytical hierarchy process (AHP) and GIS were used to prepare the flood susceptibility maps of the Baitarani River basin. Analysis showed that nearly 87% of the river basin area is under intermediate flood hazard zones and 10% area is under high flood hazard zone. The effects of severe flooding in the Baitarani River basin are visible in three blocks in Jajpur district, two blocks in Bhadrak district and Anadapur block in Keonjhar district of Odisha. Occurrence of floods over the period of time has resulted 8% decline in agricultural land during 1995 and 2020. Hence, it is necessary that integrated flood management measures along with watershed management approaches in the upper catchment areas are suggested to minimize the risk of flooding in the basin. *Diggi* is an indigenous micro-hydrological structure for water management at field scale. Remote sensing satellite images of three years at an interval of 10 years were used to create GIS maps (3) and database for extent of irrigated croplands, farm ponds (*diggi* structure) and wind erosion affected area of Jaisalmer. It was found



that number of diggies increased 10 times during 2021 compared to the year 2001 and irrigated area expanded about 4.5 times. The wind erosion affected area was reduced by 1,63,371 ha.

Sand-based runoff filter, comprising of coarse sand, gravel and pebble, has been developed to harvest runoff from farmers' fields for artificial groundwater recharge in Semi-arid region of Gujarat. The intervention resulted in rise in groundwater table in the village by 1.84 m and farmers were able to give full irrigation to *rabi* crops.



Modified sand-based runoff filters for artificial groundwater recharge.

To address the availability of quality gypsum for reclaiming sodic soils, three categories of sulphur-based formulation (RFS) were developed suitable for different soil sodicity conditions. These formulations are highly reactive and get oxidized within one crop season by the soil microorganisms to help in alleviating the stress caused due to excess of the alkaline salts present in soils. A salt tolerant Indian Mustard CS 64 variety has been notified after release by CVRC for salt affected areas of the Haryana, Punjab, Rajasthan, Delhi and Uttar Pradesh, Plains of Jammu and Kashmir, Himachal Pradesh.

**Mechanization and Energy Management:** An Economy seeder was developed for *in-situ* crop residue management technology suitable for heavy soils. It performs three operations simultaneously, namely chopping of the crop residue, tilling and mixing the chopped residue and sowing. Small tractor operated sugarcane base cutter has been developed for cutting and windrowing the whole cane in field. Base cutter is powered by tractor PTO through pulley with V-belt drive. A tractor operated whole-cane harvester has also been developed with a base cutter unit, crop gathering unit, cane

walker, de-topper and cane collection trolley. All these mechanisms are hydraulically operated and can be mounted on a tractor three-point links. The average field capacity of the unit is 0.11 ha/h and field efficiency of the unit is 0.70%. The equipment saves 71% in cost when compared to manual harvesting.



Tractor operated whole-sugarcane harvester

A manual harvesting tool has been developed for okra harvesting. It eliminates the complete hand touch of okra pod. A long-handle pineapple leave pruner has been developed. The field capacity of the pruner is 0.005 ha/h. A computer vision based bird identification system has been developed to count the birds and can be used to calculate the amount of feed to be dispensed. The computer vision approach is effective in detecting birds and can be effectively integrated into the automatic feed dispenser for poultry birds. An automatic spraying system has been developed for chemical application inside the polyhouse. The developed system has two units, i.e. automatic spraying unit (ASU) and DC motor-operated row changing unit (RCU).

Animal drawn single row automatic feeding type potato planter-cum-fertilizer applicator has been developed. It also performs the function of furrow opening and covering of the seed tuber thereby making ridges. The actual field capacity was 0.09 ha/h with field efficiency of 74%.

A bullock drawn 8-row pre-germinated paddy seeder-cum-herbicide applicator has been developed for simultaneous application of line sowing of pre-germinated paddy seeds and application of pre-emergence herbicide. The cost of operation of bullock drawn 8-row pre-germinated paddy seeder-cum-herbicide applicator is ₹1,032/ha. A flue-cured Virginia tobacco leaf stringing machine has been developed. This unit can produce one stick per 20 s (@4 kg of fresh tobacco leaves/stick) with a





Animal drawn single row potato planter

stringing capacity of  $730 \pm 100$  kg/h an oval-shaped needle and yarn made of viscose material. An agro-residues based bio-sorbent for the treatment of Bulk Milk Chiller (BMC) effluents has been developed. The bio-sorbent was prepared through pyrolysis of agro-residue under controlled environment. The hanging type plastic feeder has been developed with help of mild steel, PVC pipes and FRP sheet. The feeder is designed in such a way that no feed/ *bhusa*/ green will fall outside the tray, so that feed/fodder loss is reduced to negligible.

**Post-harvest Management and Value-addition:** *Hawaijar* is a traditional fermented food of North-East India prepared from soybean. *Hawaijar* making mechanized system was developed and unit operations considered in the mechanized system are soaking, steaming and incubation. The designed capacity of the developed mechanized



Lac Color Index Analyzer (LaCilyser)

batch type system is 10 kg. A low cost ready-to-use kit was designed and developed for its application in retail packets as well as household level metallic drum storage to manage major storage insect-pests of chickpea. A portable, electronic, and hand-held device for lac colour index analysis has been developed based on the principle of colorimetry.

ICAR-CIRCOT has designed and developed a compact, and energy efficient direct heating type 'Cotton Seed Dryer' on PPP basis. It is designed using innovative collapsible MS belts that allow heating of cotton seed twice (one on top and another on bottom side) on each conveyor leading to development of energy efficient compact drying system. A new process for menthol crystal production from mint oil was developed to reduce the time of production.

**Climate Resilient Agriculture:** Pusa Sanjeevni, a bacterial formulation with 6 months of shelf-life was developed based on the results of phytotron and field trials were carried out at farmers' field at NICRA adopted villages. The formulation was evaluated in rice-wheat cropping system at the farmers' field. The four bacteria in consortium assisted in better germination, vegetative growth, and increased yield under low moisture. Several climate-smart interventions for rice, chickpea, wheat, soybean, and greengram have been identified for the NICRA-adopted village using the CCAF-mitigation option tools.



Pusa Sanjeevni

Application of dichorionic di-amniotic (DCDA), resulted into reduction in the GWP (Global Warming Potential) by 33.2 and 4.9% under higher and medium carbon strata, respectively under conventional tillage practice, while the reduction of GWP by 25.0 and 9.7% under high carbon and

medium carbon, respectively under zero tillage practice. Prototype Integrated Farming System models have been established through AICRP on Integrated Farming Systems and All India Network Programme on Organic Farming in the country for improving the income of the farmers and sustainability, besides addressing the climate change. Till now, a total of 71 prototype IFS models (including 8 integrated organic farming system models), 63 on-farm farmer participatory refined farming systems and 32 bankable models have been developed, suitable for 26 States and UTs.

**Human Resource Development:** The Education Division, ICAR helps to ensure quality assurance of 74 AUs and various agricultural colleges with private universities through accreditation process. Various training programmes under the plan scheme of Agricultural Education Division as well as NAHEP and NAARM helped enhance the capabilities of the faculties and students in various upcoming areas and improved the nature of publications out of PG research. AUs were also provided assistance for encouraging holistic development of students, as well as limited support for Agribusiness Incubation Centres. A total of 42 new applications for accreditation of degree



Students of AUs in KVKs

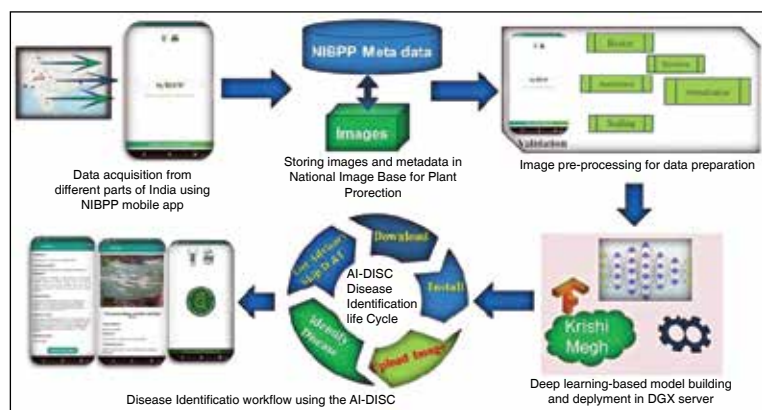
programmes, colleges and agricultural universities were received in the year 2023-24. Ten Agricultural Universities including backlog of previous year, were granted accreditation.

A total of 583 and 292 students were awarded ICAR PGS and ICAR JRF/ SRF for Master's and Doctoral studies, respectively. Krishikosh is a digital repository (<https://krishikosh.egranth.ac.in/>) of valuable documents in the field of agriculture and allied sciences has

been created and strengthened. Currently this digital repository has 50 million digitized pages in more than 3,00,000 digital items (volumes) like old books, old journals, reports, proceedings, reprint, research highlights, training manuals, historical records, which includes more than 1,90,000 theses digitized from various NARES Institutes/SAUs. During the year, a tool for Important Keywords extraction along with its frequency in different years from the metadata of these titles available in Krishikosh repository was developed. The key components of NAHEP, viz. Centres for Advanced Agricultural Sciences and Technology (CAAST), Institutional development Plan (IDP), and Innovation Grants have contributed to enhanced entrepreneurship opportunities and other reforms in AUs. NAHEP is benefitting 76 institutions in the ICAR-AU System, including 65 State-level agricultural universities, 4 Deemed Universities, 4 Central Universities with agricultural faculties, and 3 Central Agricultural Universities.

**Social Science:** Sustaining the momentum in pulses production requires a technological breakthrough and restriction on imports to incentivise farmers to produce more. The strategy to enhance pulse production should be built around bridging the yield gap, effecting a technological breakthrough, and adopting a crop-neutral price policy. A meta-analysis of some important sustainable agricultural practices showed that these interventions produce several ecosystem services and the monetary value of such non-tradable services ranges from ₹ 3,742 to 15,142 per ha, accounting for 34-77% of the total value of the ecosystem services.

An Artificial Intelligence (AI) based android mobile application, called AI-DISC (Artificial Intelligence Based Disease Identification for Crops) has been developed that can automatically identify plant diseases with visible symptoms.



Artificial Intelligence Based Disease Identification for Crops (AI-DISC) App



KCC-CHAKSHU (Kisan Call Centre-Collated Historically Aggregated Knowledge based System using Hypertext User Interface) has been developed. To implement an intelligent on-line platform for supporting agriculture, Kisan Sarathi implemented and strengthened in association with Digital India Corporation, Ministry of Electronic and Communication Technology (MeitY), Government of India. This is an on call advisory services for farmers of India, where any farmer can call or record their query in his own language automatically directed to respective KVK/ATARI for query redressal.

KVK portal (Krishi Vigyan Kendra Knowledge Network) has been strengthened by adding new functionality to add information on yield gap index and to view state and district wise report in the portal. E-Learning portal has been developed with an objective to strengthen the Agriculture Higher Education in India by developing and disseminating the e-courses for undergraduate and postgraduate courses. At present E-contents for 70 postgraduate and 141 undergraduate courses are available on this portal. Experimental Data Repository and Infographics Dashboard of KRISHI (Knowledge based Resource Information System Hub for Innovations in Agriculture) were enriched with more information systems. ICAR Geo-Portal was updated. Area Production and Yield Information System was developed. Developed a machine learning-based computational model for prediction of miRNAs associated with four specific abiotic stresses such as cold, drought, heat and salt. An online prediction server “ASmiR” (Abiotic stress responsive miRNA prediction in plants) was developed. For Empowering Women in Agriculture, ICAR-CIWA is actively engaged in a range of research projects addressing gender issues in agriculture and related fields. It is operating across 12 states in India, in collaboration with 13 State Agricultural Universities, as AICRP on Women in Agriculture. Two Custom Hiring Centres focusing on Spice Processing and Mushroom were established in Puri district of Odisha for Farm women mobilization and empowerment. To enhance the efficiency of agricultural operations, Women Self-Help Group (SHG)-based Custom Hiring Centers (CHC) and Farmers’ Interest Groups (Ananya Mahila Bikas Samiti) were established.

**Basic and Strategic Research:** During the reporting period, NASF has approved 12 new projects on novel aspects. NASF also invited the pre-proposals for new research projects for Call

X under seven strategic areas. Total number of 737 pre-proposals has been received under these strategic areas. Gene editing with CRISPR-Cas9 technology was employed to develop mutants of the *DST* (Drought and Salt Tolerance) gene, a zinc finger transcription factor in rice cultivar MTU 1010. Genome-wide association studies (GWAS) conducted using phenotyping data for agro-morphological and stress tolerance traits identified numerous genes related to these traits. The fine mapping studies provided the precise map position of important alternative dwarfing loci *Rht14* and *Rht18* in wheat. After annotation and based on domain search analysis, five lipases and two lipoxygenases were identified and cloned.

Marker assisted stacking of yellow mosaic disease resistance, null kunitz trypsin inhibitor, null *lipoxygenase-2* genes, and broadening the genetic base of soybean was done. A survey was done for the identification of genomic regions for fall armyworm *Spodoptera frugiperda* resistance in maize, a parental polymorphism was done using 531 sequence-tagged microsatellites (STMS) markers. A volatile biomarker(s) was identified for the screening of scab resistant apple germplasm at early stage non-destructively. To manage the pest whitefly, *Bemisia tabaci*, RNAi silencing mediated control done. A prototype “MEGH” (Measuring Essential Good Hydration) was developed for field deployment and estimation of the moisture from soil in a non-contact manner. Microbial consortium package has been standardized for *in situ* decomposition of paddy straw. An integrated seeder cum microbial inoculum applicator machine was developed for *in situ* rice-residues management. Artificial Intelligence and IoT based Smart Vet Ecosystem for animal health, patient care and precision livestock farming was developed including the prototypes of Electronic Health Records for Animals (eHRA) and Electronic Veterinary Medical Records (eVMR). Health and Medical Data Architecture Modules and data panels were developed.

Development of a Cocktail Vaccine with Omicron and Delta Strains was carried out by isolation and genetic characterisation of the Omicron and Delta variants of SARS-CoV-2. A protocol was made after standardising all the features related to capturing the facial image of the animals for Traceable value chain for safe pork in the North Eastern Region of India. A sensing device (IMAGinE) was developed for detection of Chromium ( $\text{Cr}^{6+}$ ) in water with very trace level detection limit. The developed  $\text{Cr}^{6+}$  sensing device IMAGinE was found to very precise

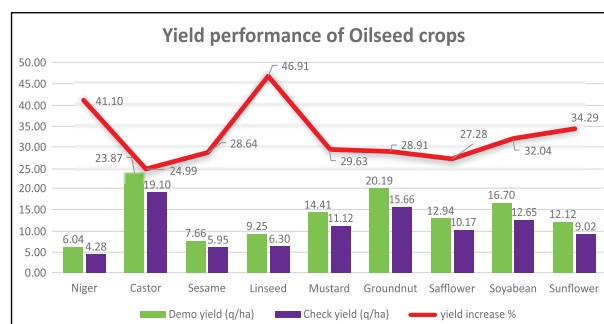
and robust with very low values of LOD and LOQ, 0.0037 ppm and 0.0112 ppm, respectively.

### Information and Communication Technology:

Smart Performance Appraisal Report Recording Window (SPARROW), an online system for electronic filling of Annual Performance Appraisal Report (APAR) of officers has been started. A total of 17,691 APARs have been generated for the year 2022–23. Agricultural Research Management System (ARMS) is the online portal for all ICAR scientists to submit their significant research achievements, has been developed and implemented. ICAR eOffice software developed by NIC has been implemented across 113 ICAR institutes along with their regional stations/sub-stations. The ICAR eOffice is hosted at ICAR data centre and is running successfully. In order to support the emerging needs of multi ways and multilingual communication among various stakeholders, “Kisan Sarathi” an Information, Communication and Technology (ICT) based interface solution was launched on 93<sup>rd</sup> foundation day of ICAR. ICAR-Data Centre, Advanced Supercomputing facility for Omics Knowledge in Agriculture (ASHOKA) and ICAR-Disaster Recovery Centre (ICAR-DRC) are established to provide support in accessing unified communication system, email services, web applications/websites hosting, e-Office, ICAR-ERP, Agricultural Research Management System, Foreign Visit Management System, Personnel Management System, eHRMS, SPARROW, Super Computing facility, and many more digital applications and platforms. In order to provide seamless ICT support to the ICAR users across country, a centralized help desk in the form of web application has been developed and implemented to address the issues and concerns related to use of these web applications and services. ICAR-Network Program on Precision Agriculture (NePPA) is focused on exploring

potential applications of recent developments on technologies related to sensors, IoTs, drone and ICTs, variable rate technologies (VRTs) for precision smart agriculture. The major objectives span its scope bringing precision in monitoring and managing soil fertility, crop health, livestock farming, post-harvest operations, aquaculture and upscaling in farmers’ field scale to enhance input use efficiency and optimal production system.

**Technology Assessment, Demonstration and Capacity Development:** A total of 6,036 technological options in various crops were assessed by the KVKs at 15,180 locations by carrying out 33,128 trails in farmers’ fields in order to provide technological alternatives to the identified problems across the country. The KVKs assessed 1,099 technological options pertaining to different thematic areas of production and management of cows, buffalo, sheep, goat, poultry, pig and fish at 3,633 locations through 6,771 trials. As part of technology assessment, 339 technologies pertaining to farm women were assessed through 3,066 trials at 1,344 locations with an aim to promote women empowerment. Division of Agriculture Extension, ICAR, New Delhi implemented Cluster Frontline Demonstrations (CFLDs) programme through KVKs on major pulse and oilseed crops under National Food Security Mission (NFSM) of Department



Yield performance of oilseed crops under CFLDs.



Main dashboard of SPARROW showing details of 2022–23.

of Agriculture & Farmers’ Welfare, Government of India, New Delhi to demonstrate the production potential of different technologies of these crops. Under capacity development, a total of 23.16 lakh farmers/farm women, rural youth and extension personnel were trained on various aspects through 74,065 training programmes including the sponsored training courses.



## BODIES UNDER DARE AND THEIR ACTIVITIES

Besides these activities, important programmes namely Out scaling of Natural Farming, Formation and Promotion of Farmer Producer Organizations (FPOs) as Cluster Based Business Organizations (CBBOs), Technological backstopping to FPOs, Demonstrations through Agri-drones, Farmers FIRST, Attracting and Retaining Youth in Agriculture (ARYA), Cluster Frontline Demonstration of pulses and oilseeds, Cereal Systems Initiatives for South Asia (CSISA), National Innovations in Climate Resilient Agriculture (NICRA), Pulses Seed hubs, *Mera Gaon Mera Gaurav* were taken up to address various challenges. During the reporting year, KVKs organized a total of 6.19 lakh extension programmes using various methods and means. These included advisory services, celebrations of important days, diagnostic and clinic services, exhibitions, exposure visits, ex-trainees sammelan, farm science club conveners' meetings, farmers' seminars, farmers' visits to KVK, field days, film shows, group meetings, kisan ghosthies, kisan melas, lectures delivered as resource persons, mahila mandal conveners' meetings, method demonstrations, plant/animal health camps, scientists' visits to farmers' fields, self-help group meetings, soil-health camps, soil-test campaigns, workshops, and other activities, wherein latest technologies related to agriculture and allied sectors were disseminated among 204.61 lakh participants including 200.58 lakh farmers and 4.54 lakh extension personnel. Additionally, KVKs are in the forefront for effective utilization of electronic and print media to have wider coverage of technology dissemination. KVKs produced technological products like seeds and planting materials of improved varieties and hybrids, bio-products and elite species of livestock, poultry and fish which benefited 11.18 lakh farmers in the country. In all, 55 Directorates of Extension Education (DEEs) in the SAUs/CAUs played pivotal role in technological backstopping to KVKs of the country. Timely and need based information to the farming community was provided by 594 KVKs by using mobile advisory services. Based on weather forecast, farmers were alerted and advised on suitable farm operations. Technology Demonstration Component (TDC) of National Innovations in Climate Resilient Agriculture (NICRA) which aims at enhancing resilience of Indian agriculture and making Indian farmers more adaptive to climatic vulnerabilities has been implemented through 151 KVKs in climatically most vulnerable districts of the country as per the latest risk categorization.

ICAR has stated Agri-Drone project, with funding support from Department of Agriculture and Farmers' Welfare, Government of India, with objective of creating awareness among the farmers and other stakeholders and demonstrating the use of drone in agriculture in farmers' fields. The innovative initiative "*Mera Gaon Mera Gaurav*" aimed to promote the direct interface of scientists with the farmers to hasten the lab-to-land process. The objective of this scheme is to provide farmers with required information, knowledge and advisories on regular basis by adopting villages particularly small and marginal farmers. Farmer FIRST is a flagship programme initiated by ICAR to move beyond production and productivity; to privilege the smallholder agriculture; and complex, diverse and risk prone realities of majority of the farmers through enhancing farmers-scientists interface. A total of 28,995 demonstrations were conducted, 2,972 extension programmes were organized, 1,03,492 animals (livestock and poultry) were benefited and 86,197 farm families were covered in all modules during the reporting period. Nutri-Sensitive Agricultural Resources and Innovations



Lilium flower field



Post-harvest flower-bundles for market.



(NARI) Programme is a flagship programme initiated by ICAR at national level. Nutrition-sensitive agriculture puts nutritionally rich foods, dietary diversity, and food fortification at the heart of overcoming malnutrition and micronutrient deficiencies.

**Research for Tribal and Hill Regions:** During the period under report, 17.453 tonnes breeder seeds of 49 released varieties/inbreds of 15 crops were produced and 16.054 tonnes breeder seeds were supplied to different seed producing agencies for downstream multiplication to foundation and certified seed. Around 1,433 kg nucleus seed of 40 released varieties of 15 crops were also produced following standard methods of maintaining genetic purity. In addition to this, 401 kg Truthfully Labelled (TL) seed of 09 varieties of 07 crops were produced and 258 kg TL seeds were supplied to different stakeholders. The central varieties, viz. VL Cookies wheat, VL Mandua 400 finger millet, VL Soya 99 soybean, and VL Uphar and VL Madhuri field pea; and state varieties, viz. VL Masoor 150 lentil and VL Matar 64 field pea were released for cultivation in north-west Himalayas.

An IOFS model comprising different enterprises, i.e. cereals, pulses, oilseeds, vegetable crops and climbing vegetables on protective structure all along the farm pond, fruits, dairy, fodder crops, central farm pond, duckery, farmyard manure (FYM) pit and vermicomposting unit was designed and tested on long term basis. The solid waste from dairy unit and farm was used for making FYM and compost. The model consists of a total area of 0.34 ha and a farm pond (0.046 ha) that can be put to use for aquaculture and duckery, and support crops with lifesaving irrigation whenever needed. The model was demonstrated to 330 households in

three villages, viz. Mynsain, Pynthor and Umden Umbathiang covering an area of about 300 ha. Results from beneficiaries who adopted the model showed that by merely investing an amount of ₹60,000 on IOFS, the farmers realized a net income of ₹65,000/annum compared to rice mono-cropping or improved rice-vegetables cropping system. Kisan Diwas was organized in the SCSP village of Uderkhani of Bageshwar district, Uttarakhand on 23 December 2022, involving the participation of 75 farmers. The event aimed to create awareness about the challenges faced by hill farmers and promote sustainable agriculture. Officials provided information on innovative farming techniques, market trends, and government schemes. An awareness programme under *Jal Shakti Abhiyan* was also conducted in the village of Uderkhani on 18 August 2022. This programme focused on water conservation, water resource management, and rainwater harvesting to ensure water security and sustainability in hilly regions.

**IP, Organization and Management:**  
**Administration-** During the year, following posts were filled up under the promotion quota: 4 Director/CAO (Senior Grade), 2 Director (F)/Comptroller, 6 Deputy Secretary/CAO, 6 Deputy Director (Finance)/CFAO, 4 Under Secretary, 7 Senior Administrative Officer, 6 Senior Finance and Account Officer, 1 Law Officer, 2 Principal Private Secretary, 7 Administrative Officer, 7 Finance and Accounts Officer, 5 Section Officer (Hqrs), 16 Assistants (Hqrs) and 3 LDC (Hqrs). During the year, 21 eligible Officers and Staff of ICAR were granted the benefits of financial up-gradation at ICAR Headquarters under the Modified Assured Career Progression scheme.



IOFS practiced in cluster approach in the adopted villages.

## BODIES UNDER DARE AND THEIR ACTIVITIES

**Finance:** The Revised Estimates in respect of DARE/ICAR for 2022-23 were of ₹ 8,658.89 crores. An internal resources of ₹ 355.13 crores (including interest on Loans and Advances, income from Revolving Fund Schemes and interest on Short Term Deposits) was generated during the year 2022-23. The total allocation Budget Estimates for 2023-24 are of ₹ 9,504.00 crores.

**Intellectual property protection:** During the period under report, 88 new Patent Applications were filed in different subject domains of agricultural sciences at Indian Patent Office (IPO). The cumulative figure of patent applications at ICAR has now risen to 1,543. IPO granted the 81 patents, which made ICAR's cumulative number of granted patents to 536. To protect the Plant Varieties, 23 varieties were filed at Plant Varieties and Farmers' Rights Authority (PPV&FRA). For applications filed earlier, 73 varieties were granted registration certificates during this period; which raised the cumulative figure of registered varieties to 1,454. During the period under report, 141 applications were filed for copyrights by 32 ICAR institutes. A total of 601 filed copyrights have been thus recorded from different ICAR institutes. Eighteen applications were filed for Designs by 9 ICAR institutes, which has risen the cumulative figure to 105. Thirty seven trademark applications were filed by 18 ICAR institutes for different products and processes. Till date a total of 255 trademark applications have been filed. ICAR has celebrated "World Intellectual Property Day" on 26 April 2023, as per World Intellectual Property Organization's (WIPO) theme of this Day in 2023 was "Women and IP: Accelerating Innovation and Creativity". World IP Day was an opportunity to highlight the importance of IP rights, such as, patents, copyrights, designs, trademarks, and plant varieties for encouraging innovation and creativity among scientific fraternity of the Council. This year, 691 partnership agreements were developed with 463 public and private organizations and farmers/entrepreneurs. In this process 64 ICAR institutes were involved from different Subject Matter Divisions,



ICAR's ABICs network programme

and transferred 381 technologies in different disciplines which include; Animal Production Technologies; Crop Production Technologies; Farm Machinery and Tools; Fish Farming and Processes; Food Processing Technologies; Plant Protection Technologies; Seed and Planting Material; Textile Process; and four technologies from allied sectors.

Various useful programmes for public utility and farmers were organized by the institutions of the Council in Hindi and Regional Languages. All activities including agriculture extension related to KVKs located in Hindi speaking areas were also performed in Hindi and Regional Languages. Various publications on different subjects like Agricultural Science, Animal and Fishery Science and Horticultural Science were brought out in Hindi and Regional Languages by the Council and its institutes from time to time. With a view to provide Knowledge of various technologies on agriculture and wider publicity thereof, monthly Hindi magazine *Kheti* was published regularly. *Rajbhasha Aalok*, in-house Hindi magazine of ICAR Headquarters, was published regularly. This magazine includes articles on scientific subjects and government schemes in simple Hindi, besides reports of various schemes and programmes being organized by the Council and its institutes from time to time. Total number of notified subordinate offices of the Council under Rule 10(4) of Official Languages Rules, 1976 has increased up to 149.

The following activities by Technical Coordination Unit were conducted during the reported period: Preparation of Monthly Cabinet Summary for Cabinet Secretary; Grant of financial assistance to Scientific Societies and Academic Institutions for holding of National/International Conferences/Seminars etc., and publication of Scientific Journals; Organizing Directors' Conference; Coordination of the ICAR Regional Committee Meetings; Coordination and collaboration with Department of Science and Technology, Department of Biotechnology, Department of Scientific and Industrial Research, CSIR, ICMR, Bureau of Indian Standards etc.; To deal with the references received from Prime Minister's Office, President's Secretariat, Members of Parliament and VIPs etc.; Preparation of draft for DARE and ICAR Annual Report and Audited Accounts to be laid down in Parliament; Parliament Questions of inter-divisional nature; Nodal point for e-samiksha portal for DARE/ICAR; National advertisement for ICAR Awards and selection of Awardees; Revision of guidelines for Awards from



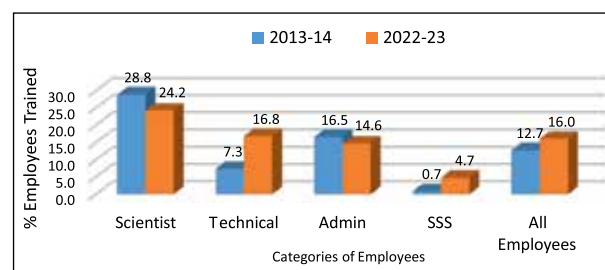
time to time, Releasing funds for Lal Bahadur Shastri (LBS) and Norman Borlaug Award projects; To handle and promote the Swachhta Action Plan (SAP): releasing of funds, uploading of approved quarterly report on SAP portal <https://swachhataactionplan.gov.in/swachhta/>; Collecting and compiling the Swachhta Pakhwada Daily reports and uploading on the portal; To handle the Swachh Bharat Mission: organization of Swachhta Pakhwada/Swachhta Hi Sewa; Development and circulation of data-wise Action plan for Swachhta Pakhwada to all ICAR establishments, preparation of daily pakhwada report, uploading the daily approved report on portal, selection of the Swachhta Pakhwada Ranking, etc. To collect, compile and provide the agenda to the Ministry of Home Affairs for Zonal Council Meetings, Arranging the Review Meetings of ICAR Institutes under the Chairmanship of Hon'ble AM; Various Campaigns from Government of India; Inter-ministerial assignments; Convergence of various Central Government Schemes and Organization of various important events.

The 95<sup>th</sup> Foundation and Technology Day of ICAR was celebrated during 16 to 18 July 2023. On the occasion, certificates of 5 new technologies related to products from SMDs and books were released. The award for Hackathon Winners were also presented, and exhibition on all the three days was also organized. Apart from the Senior Officers of ICAR, and other departments about 500 Farmers and 500 School Children visited the Exhibition during 16 to 18 July 2023. Sh. Narendra Singh Tomar, Former Union Minister of Agriculture and Farmers Welfare and President of the ICAR Society, on this occasion congratulated the ICAR and dignitaries.

**Training and Capacity Building:** Twelve specialized online/offline training programmes, viz. Executive Development Programmes for Newly Recruited Research Managers of ICAR; Advances in Simulation Modelling and Climate Change Research towards Knowledge Based Agriculture; Management and Utilization of Plant Genetic Resources; Capacity Building Programme for Effective Implementation of Training Functions in ICAR by HRD Nodal Officers/Co-Nodal Officers; Training Workshop for Vigilance Officers; Automobiles Maintenance, Road Safety and Behavioural Skills; Pension and Retirement Benefits; National Pension Scheme; Capacity Building Programme for CJSC members; Agrometeorological Data Collection, Analysis and

Management; Farm Management and Principles and Production Techniques of Hybrid Seed in Vegetables were organized by 08 Competent ICAR-Institutes. In these programmes, 433 employees of various categories as per programme participated.

During the reporting period, 1,137, 686, 422 and 161 scientists, technical, administrative including finance, and SSS were trained, respectively constituting a total of 2406 employees were trained. Compared to 2013-14, there was considerable improvement in number of employees undergone trainings where improvement was 85.4 and 302.5% in Technical and Skilled Support Staff, respectively during 2022-23. The training programmes organised for scientists, technical, administrative including finance, and skilled support staff were 229, 50, 24 and 16, respectively with 319 total number of training programmes. ICAR also nominated 548 employees of various categories in training and capacity building programmes organized by various ICAR/non ICAR-Institutes, out of which 369 employees attended the training programmes. Impact assessment of trainings attended by 2,171 employees of various categories of 90 ICAR-Institutes during 2020-21 was done as per proforma developed by DoPT. It indicated that the overall impact of training was assessed as Considerable-Great Extent with average rating of 4.05/5.00 by the trainees while it was rated as Considerable-Great Extent with average rating of 3.96/5.00 by their Reporting Officers.



Per cent employees undergone training with the creation of HRM Unit.

**Publications, Social Media and Public Relations:** With the advent of ICT the research journals were made available online (<https://epubs.icar.org.in>: Indian Agricultural Research Journals) and placed in open access. This platform was developed under NAIP and now hosts 53 journals belonging to ICAR funded societies. Its facilities include online article processing system, referee system and archives. The portal has archives of back volumes of research journals till 1994 pertaining to *Indian Journal of Agricultural Sciences* (280

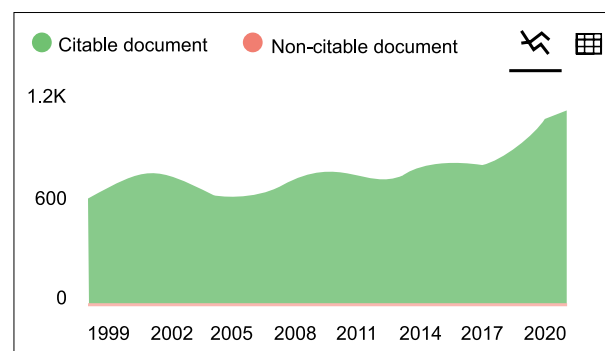
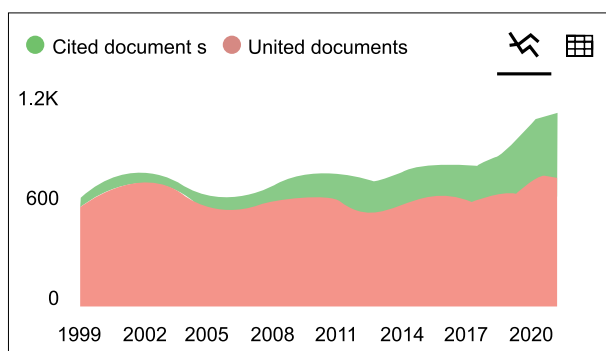
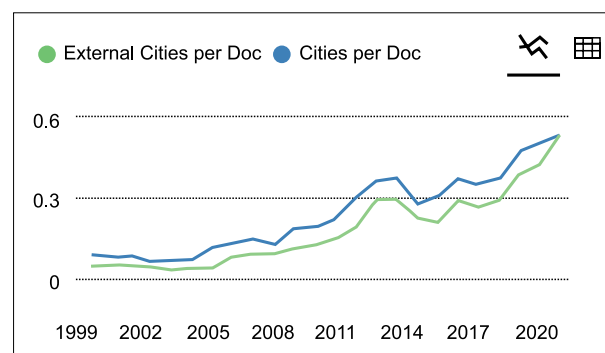
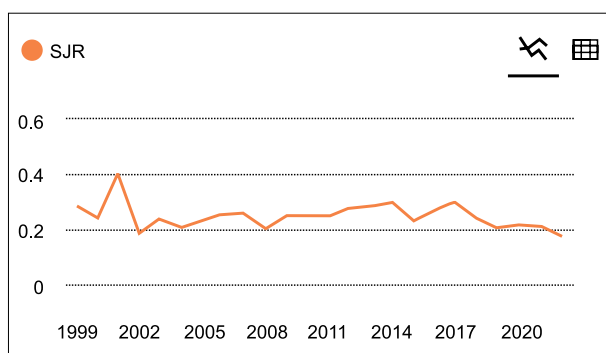
## BODIES UNDER DARE AND THEIR ACTIVITIES

issues) and *Indian Journal of Animal Sciences* (292 issues). Whereas the popular journals namely *Indian Farming* (106 issues) and *Indian Horticulture* (60 issues) are also hosted. About 37,000 articles are available online globally in open access. A new OJS version 3.4.0-4 (<https://epubs.icar.org.in>) was developed and implemented for the journals. *The Indian Journal of Agricultural Sciences* and *The Indian Journal of Animal Sciences*, the flagship research journals of ICAR having international fame have a wide clientele. These journals received a total of 3,697 (*The Indian Journal of Agricultural Sciences*) and 1,547 (*The Indian Journal of Animal Sciences*) submissions during the reporting period. Out of these submissions, 285 articles in *The Indian Journal of Agricultural Sciences* and 280 articles in *The Indian Journal of Animal Sciences* were published. The user base of the journals is expanding and has reached to 41,410 users in *The Indian Journal of Agricultural Sciences* and 22,610 users in *The Indian Journal of Animal Sciences*. The journal website was visited nearly 45,000 times with audience belonging to 143 countries. The journals have considerable metrics, viz. impact factor and H index are 0.37 and 29 for *The Indian Journal of Agricultural Sciences* and 0.31 and 23 for *The Indian Journal of Animal Sciences* despite the fact that these are multi-disciplinary in nature.

The total submissions in the *Indian Farming* and *Indian Horticulture* were 380 and 148, respectively. The registered users were 5,610 in the *Indian*

*Farming*, whereas 3,710 in *Indian Horticulture*. A total of 180 articles were published in the *Indian Farming* and 76 in *Indian Horticulture*. Special issues of the *Indian Farming* were brought out on the themes like Rich in Heritage, Full of Potential on the occasion of International Year of Millets 2023 and on the G20 Meeting of Agricultural Chief Scientists. Special issues of the *Indian Horticulture* on the themes such as Vegetable Crops, Medicinal and Aromatic Plants and Horticulture in North East Region were brought out.

During the year, Digital Object Identifier (DOI) number allotment to the more than 5,000 articles for both the research journals was continued for the benefit the authors as well as journal immensely. To provide authentic knowledge to readers of the research journals plagiarism checker software iThenticate was subscribed. For facilitating publication of the books, e-book platform was developed. Under the books publication programme of the English Editorial Unit, seven new titles were published namely Textbook of Watershed Hydrology, Textbook on Cheese Technology, Importance of Millets and Improved Production Technologies, Fundamentals of Soil Science, Fundamentals of Soil and Water Conservation Engineering, Textbook of Entomology and Textbook on Veterinary Extension. The in-house publication like *ICAR Reporter* and *ICAR News* are also available on ICAR website for wider global reach. These were viewed in about 140 countries world over.



*The Indian Journal of Agricultural Sciences* metrics.

The ICAR flagship Hindi monthly journal '*Kheti*' and bimonthly horticulture journal '*Phalphul*' were published by HEU timely on regular basis. During the reported period 4 special issues of *Kheti* were published namely '*Pashu Aahar Visheshank*', '*Dalhan par Vishesh Samagri*', '*Matsyiki Visheshank*', '*Sasya Vigan Congress Visheshank*'. Similarly three special issues of '*Phalphul*' namely '*Phal Sabji Prasanskaran*', '*Paudh Nursery*' and '*Videshi Evam Alpdohit Bagwani Fasal Visheshank*' were published. Apart from journals, a booklet *Ullekhiya Uplabdhian (2014-2023): Amrit Kal mein Viksit Bharat ki Akanchh a ke Saath Badhte Kadam* and a book *Dalhan Fasal : Suraksha va Sanrakshan* were also published.

To disseminate information in real-time, the ICAR website is updated on a regular basis, and in total 4,613 pages were updated with a total of 41,89,432 page views from more than 200 countries were recorded. Knowledge seekers across the globe visited the Website. The top five countries visiting the Website include India, United States of America, United Kingdom, United Arab Emirates and Nepal. A newly designed and more user-friendly ICAR website was developed and hosted with more than 19,000 pages. The New Website has a Publication Cart through which the stakeholders can purchase ICAR Publications online. During the reporting

period DARE website ([dare.gov.in](http://dare.gov.in)) was certified with GIGW certification from STQC. On ICAR Facebook, a total of 519 Posts were published during the year and it has 2, 29,171 Followers. ICAR Twitter Handle has more than 2,28,458 Followers. On an average, 3 Tweets are posted every day and a total of 1,114 Tweets were posted during the year and Tweets earned 2,161.29K impressions. The YouTube Channel of ICAR has Video Films, Animations, Lectures/Interviews by dignitaries and Eminent Scientists, Proceedings of National and International Events, etc. It has 72,700 Subscribers. ICAR participated in Republic Day Celebrations third time on 26 January 2023 with a tableau on the theme of International Millets Year declared by UN. The council participated in and coordinated about 51 National and International level exhibitions annually like the Exhibition during ICAR foundation day, Indian Science Congress at Nagpur, Vision Rajasthan at Sirohi, 19<sup>th</sup> Agro organic world expo etc. The revolutions witnessed in the dairy and fisheries sector due to ICAR's efforts has far-reaching implications. Beyond economic growth, these developments contributed significantly to the food, nutrition, and livelihood security of the country. ICAR's research doesn't merely address immediate challenges but actively contributes to building a resilient and sustainable future.



## CENTRAL AGRICULTURAL UNIVERSITY (CAU), Imphal

Central Agricultural University (CAU), Imphal was established in the year 1993 under the Central Agricultural University Act, 1992 of the Parliament (Act No. 40 of 1992). It is a fully residential university having 13 constituent colleges covering 7 North-East Hill states under its jurisdiction except Assam.

### Academic

The Central Agricultural University offered 9 Undergraduate, 47 Masters and 30 Ph D Degree Programmes in different subjects/disciplines through its 13 constituent colleges. The University was ranked at 29<sup>th</sup> position in the ranking status of Agricultural Universities for the year 2022 by National Institutional Ranking Framework (NIRF). On the recommendations of the ICAR Peer Review Team, the National Agricultural Education Accreditation Board, ICAR, New Delhi granted accreditation for various academic programmes (UG/PG/Ph D) to the Central Agricultural University, Imphal (Manipur) and its constituent colleges from 28 March 2021 to 27 March 2026.

The new academic session started from 2 July 2022 for both UG and Master's courses except College of Veterinary Sciences and Animal Husbandry where it started from 4 October 2022. The Ph D Programmes for all the colleges started from 2 August 2022. A total of 564, 232 and 55 students were admitted in various Under-graduate, Masters and Ph D programmes, respectively degrees during the year. A total of 424 UG and 202 PG students completed their degrees and 28 students were also awarded Ph. Ds during this period. Out of the total students' strength of 2,805 in the University, 459 students belong to the general category, 212 scheduled castes, 1,364 scheduled tribes, 724 other backward castes and 46 EWS/Physically handicapped/others. Out of total students of the University, 1,182 students were male and 1,623 were female resulting in Male : Female ratio of 1:1.37.

The students of the University performed well at national level competitive examinations. During the period under report, 18 students have secured Junior Research Fellowship (JRF), 7 students ICAR SRF and 9 GATE Fellowship. One student has cleared CAT examination. Six students have cleared UGC NET examination during the period. Three students

cleared ARS examination conducted by the ASRB, New Delhi. The University has an exemplary record of placement in a number of private and public sector organizations, and government undertakings. A total of 195 of students were placed during the period in various capacities in different organizations.

### Research

The University research aims to formulate need based research projects through sustainable and eco-friendly scientific and technical approaches for developing agricultural technologies/practices/ agricultural machines and equipments which can bring about a far reaching impact on productivity and profitability of crops, animals and fishes and develop new products for value-addition, enhance income generation and in turn the socio-economic upliftment of the people of North Eastern Hill Region. During the year, University carried out 25 Intramural Research Projects (IRPs) and seven projects completed under University Funded Research Programmes. Out of the 102 Externally Funded Research Projects, 17 were newly sanctioned, 72 ongoing and 13 were completed. The University also took up, from time to time, the contingency research projects and station research and trials which are of great concern and need immediate attention in the region.

A promising line of swamp taro (*Colocasia esculenta* var. *stoloniferum* CAUST-2 (IC645898) was recommended for release in Manipur in the 22<sup>nd</sup> Annual Group Meeting of AICRP-Tuber Crops held at ICAR-RC-NEH, Barapani, Meghalaya. The proposal for two promising lines of paddy, viz. CAUS 105 (IE T27496) and CAUS 107 (IET 28210) have been submitted to State Variety Release Committee of Meghalaya to release these as high yielding varieties of the state.

Out of the 303 rare and endemic fish species of North East water bodies, 182 fish species were bar-coded. A mini fish smoking kiln of 10 kg capacity and low cost pabda hatchery were developed. Four new species of stingless bees *Lepidotrigona* spp. (Hymenoptera: Apidae: Meliponini) drinking tears and sweat from human beings were reported from North-East India for the first time. Mass production of proven native biocontrol agents based bioformulations like UmTricho (*Trichoderma harzianum*), UmBir (*Beauveria bassiana*), UmMet

(*Metarhizium anisopliae*), UmLec (*Lecanicillium leccanii*) and UmComb (A consortial formulation) using standardized liquid fermentation technology. Standardized micro shoot tip grafting of Khasi mandarin using three different rootstock species. Out of the 20 species of tropical and sub-tropical orchids collected, 17 species have flowered at Pasighat, Arunachal Pradesh. Developed IoT based Micro-irrigation system for polyhouse condition. A hand tool for segregation of capsules from large cardamom spikes was developed with efficiency of 5 to 7 spikes/minute as compared to 2-3 spikes manually. A small power thresher for buckwheat crop with threshing efficiency of 99.21% was developed. An isothermal polymerase chain reaction (PSR) technique was developed for rapid and specific detection of porcine pleuropneumonia in field condition. Out of three species of ticks infesting domestic and semi-domestic bovine in Mizoram, *R. microplus* was closer to isolates of China indicating trans-boundary movement of cattle from Myanmar into Mizoram. Altogether 2 patents, viz. hand operated device for harvesting fruits and vegetables and food pollen substitute composition and formulation from rice bean (*Vigna umbellata*) for apiculture have been filed.

### Extension Education

Transfer of technology activities were planned and coordinated in different districts of the seven states through 13 constituent colleges, six Krishi Vigyan Kendras and six Multi Technology Testing and six Vocational Training Centres.

The University also organized Annual Zonal Workshop of KVKs with 90 participants and an Interface Meet with the National/Zonal level award

wining KVKs and scientists of KVKs of the NEH Region totalling to 124 participants.

The University also took part in the 'Exhibition in connection with International Conference on SDGs' at DRI, Chitrakot, MP; 'Global Organic Expo 2022' at IARI, New Delhi; '3<sup>rd</sup> Gramodaya Mela' at DRI, Chitrakoot, MP and 'Regional Agri-Fair' at ICAR-RC for NEH Region, Umiam, Meghalaya.

Financed by the MeitY, GOI, and implemented by DIC, New Delhi and CAU, Imphal, "Mobile Based Agro-Advisory" Apps by College of Fisheries, Tripura, College of Veterinary Sciences and AH, Mizoram; College of Horticulture and Forestry, Arunachal Pradesh; College of Agriculture, Manipur; and College of Post Graduate Studies in Agricultural Sciences, Meghalaya were developed for the welfare of the farmers.

Four successful startups incubated under CHF R-ABI were nominated to represent North East and to showcase their products at Agri Startup Conclave and Kisan Sammelan 2022 held during 15-18 October 2022 at IARI Mela Ground, Pusa, New Delhi.



Shoot tip grafting of Khasi mandarin.



New species of stingless bees



Orchids flowered at Pasighat, Arunachal Pradesh.



## BODIES UNDER DARE AND THEIR ACTIVITIES

### Human Resource Development

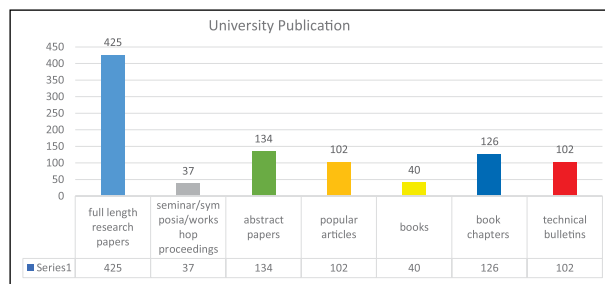
The University has total staff strength of 1,083, including 28 administrative, 300 teaching and 755 non-teaching positions. At the headquarters, there are 11 executive officers in the administrative positions supported by 44 technical and 94 non-technical staff. In the constituent colleges of the University, there are 17 administrative staff, 300 teaching and 617 non-teaching staff. Six regular Deans were newly appointed and 2 Incharge Deans, 2 MTS were appointed, 29 staff members were transferred and 27 superannuated/resigned/demised from the service during the period under report. A total of 465 trainings, workshops, conferences, seminars, summer schools etc were organized at different constituent colleges of the University. Among faculty members 41 were deputed for participation in international conferences and seminars, 44 national conferences and seminars, 24 workshops and 13 long term training courses and 30 for short term training programmes. A total of 230 lectures, keynote addresses and invited talks were delivered by the faculties at various trainings, workshops and other programmes. A total of 33 guest lectures were delivered by reputed scientists from other institutes at different constituent colleges of the University. A total of 44 faculties of the University were also recognized for their excellence in research and developmental works and eight MOUs were signed with reputed institutes during the period for cooperative relationship through mutual assistance in the areas of education, research and extension activities.

Under IDP-NAHEP sanctioned to the University by ICAR, seven campus of the University including headquarters have been converted into Solar Powered Renewable Energy Campus with savings of ₹12 – 15 lakhs annually in form of reduction in electricity bill. A total of 104 webinars/trainings related to communication skills, 29 Personality Development programmes, 10 Technical Trainings, 3 Environmental sustainability, 2 Alumni Talk series, 4 Career counselling cum job fairs, 8 Motivational Talks and 2 Seminars on social cause were also conducted under the project with beneficiaries of 3,736 out of which 1,750 were females. Since the establishment of 6 incubation centres under IDP-NAHEP, entrepreneurship has been one of the keen areas of interest for the final year and fresh graduates of the University. Every year students are taking up entrepreneurship after graduating from the University. This year (2022–23) also University

has 2 successful entrepreneurs, viz. Mr. Y. Nandan Singh [B. Tech (Food Tech.)] and Ms. Amen Kadu [B.Sc. (Community Science)].

A total of 62 students from 10 colleges of the and 19 faculties of the University have undergone foreign training from 2 weeks to 3 months in reputed institutions and 59 students from 11 faculties are undergoing foreign training.

### University Publications



### Major Events

Visit of Hon'ble Chief Minister of Manipur, Shri N. Biren Singh in the Inaugural Programme of Agri-Horti Expo for Organic and Indigenous Products of Manipur and Buyer and Seller Meet which were held at Hapta Kanjeibung, Palace Compound, Imphal from 28 to 30 April 2023.



An International Conference on Natural Farming for Revitalizing Environment and Resilient Agriculture-NF-RERA 2023 which was held at College of Agriculture, Iroisemba, CAU, Imphal during 17-19 March 2023.

Visit at CAU Central Research Farm, Lamphelpat, Imphal by Shri Kamakhya Prasad Tasa, Hon'ble Chairman, Member of Parliament (RS) accompanied by Hon'ble Vice Chancellor, CAU, Imphal Dr. Anupam Mishra and other officials of CAU on 16th April, 2023.



30<sup>th</sup> Foundation Day of CAU, Imphal.

International Conference on Responsible Aquaculture and Sustainable Fisheries Interact



(RASHI-22) was organized at College of Fisheries, CAU (I), Lembucherra, Tripura during 13-16 December 2022.



# DR. RAJENDRA PRASAD CENTRAL AGRICULTURAL UNIVERSITY, PUSA, SAMASTIPUR, BIHAR

## Background

Dr. Rajendra Prasad Central Agricultural University, Pusa established on 7 October 2016, which owes its legacy from the Agricultural Research Institute and College, Pusa (1905) and Rajendra Agricultural University, Pusa (1970) is making all efforts to generate a pool of qualified human resources in agriculture and allied field, committed for developing crop varieties and technologies for different categories of farmers under diverse agro-ecological situations and transferring the technologies for decent livelihood of farming community, thereby improving the overall economy of the country. The University has its jurisdiction in teaching, research and extension education programmes extended to the entire country with special emphasis on the state of Bihar.

(ICAR), Government of India were present. Altogether 242 undergraduate, 371 postgraduate, and 22 Ph D students were awarded degrees along with gold medals to the university toppers. On this auspicious day the “Flag Hoisting Ceremony” on academic premises was also done.



## Academic

### University Foundation Course: Deeksharambh-2023

First of its kind in the ecosystem of agricultural education in the country revitalizing Guru-shishya Parampara designed in line with the NEP-2020 as well as the ancient text of India, citing ‘Vaad-Vivaad’ (debate) and ‘Tarqshastra’ (the philosophy of dialectics, logic, and reasoning). Core aim of the programme was facilitating holistic development of the students through positive inculcation of EQ, IQ, SQ and leading to mindfulness. A step forward towards ‘Vikasit Bharat’ in “Azadi ka Amrit Mahotsav” by focusing on National Education Policy-2020. Various themes highlighting the activities carried out under this programme were music and songs, art and craft, dance, literary, drama and theatre, sports and games, yoga, and soft skills.



**Third Convocation of DRPCAUI:** It was held on 28 February 2023 at Sugarcane Research Institute premises, DRPCAUI, Pusa. The Chief Guest of the convocation was Shri Narendra Singh Tomar, Former Hon'ble Minister of Agriculture and Farmers Welfare, Government of India. On this auspicious occasion Shri Kailash Choudhary, Hon'ble Minister of State, Ministry of Agriculture and Farmers Welfare, Government of India, Dr. Himanshu Pathak, Secretary (DARE) and DG



## Promoting Natural Farming

University has taken the initiative on natural farming and designed its course curriculum which is to be implemented throughout the country with help of ICAR institutes and SAUs.

## Infrastructure Development

National Flag has been installed on 106 feet high steel pole in the academic premises at Tiranga Park giving prominent visibility and a sense of national pride and patriotism.



National Flag at DRPCA

## Research

**13th Research Council Meeting (Rabi-2022):** It was organised by the Directorate of Research from 21 to 23 November 2022. The meet was chaired by the Vice-Chancellor, Dr. P. S. Pandey under gracious presence of subject experts. Significant delegations:

### External Experts:

- Dr. A. R. Pathak, Former Vice Chancellor Navsari Agricultural University, Gujarat
- Dr. K. K. Satpathy, Former Director, ICAR-NIRJAFT
- Dr. M. B. Chetti, Former Vice Chancellor, UAS, Dharwad

### Special Invitees:

- Dr. Madan Pal, Emeritus Scientist, ICAR-IARI New Delhi
- Dr. P. K. Singh, Director Research, BAU, Sabour

### Outcome:

- Presentation of 17 externally funded, 32 internally funded and 26 ICAR-AICRP projects
- Discussion on the proposals for two sugarcane varieties namely, Rajendra Ganna-6 and Rajendra Ganna-7 as well as two technologies on “Turmeric crop harvesting implement” and “Turmeric crop sowing implement” was

conducted.

## 14<sup>th</sup> Research Council Meeting (Kharif-2023):

It was organized by the Directorate of Research from 3 to 5 July 2023. The meet was chaired by Vice-Chancellor, Dr. P.S. Pandey under distinguished presence of following experts.

### Invited experts:

- Dr. A. R. Pathak, Former Vice Chancellor Navsari Agricultural University, Gujarat
- Dr. M. B. Chetti, Vice Chancellor, Sanskruti University, Mathura, Former Vice Chancellor, UAS, Dharwad
- Dr. Meenu Srivastava, Dean, College of Community Science, MPUAT, Udaipur, Rajasthan
- Dr. Dilip Kumar, Former Director, CIFE, Mumbai Advisor, BASU, Patna
- Dr. Bikas Das, Director, NRC-Litchi, Muzaffarpur, Bihar

### Outcome:

- Presentation of 11 externally funded, 17 university funded, 17 ICAR-AICRP projects
- Presentation of ZREAC for Zone-1 of Bihar
- One Technology -TARO Planter was released
- Eight Industry-Academia Interface MoUs signed in 2023

Embryo Transfer Technology: First embryo flushing of donor cow was done on 28 December 2021 and healthy ET female calf with a body weight of 21 kg was born on 8 January 2023 under Rashtriya Gokul Mission Project. Biological mother of this calf is ‘Sahiwal T-193’ and surrogate mother is ‘Cow No. 62/14’. Climate Resilient Agriculture (CRA) project has been operationalized on 6,899 ha of land, benefitting more than 17,000 farmers.

## Extension

## Inauguration of KVKs Administration Building

- KVK-Turki, Lada, Sukhet and Narkatiaganj’s administrative building and Farmers Hostel were inaugurated by the Chief Guest Shri Narendra Singh Tomar, Former Minister of Agriculture and Farmers Welfare, Government of India, in the gracious presence of Shri Kailash Chaudhary, Hon’ble Minister of State, of Agriculture and Farmers Welfare, Govt. of



## BODIES UNDER DARE AND THEIR ACTIVITIES

India, Dr. Himanshu Pathak, Secretary, DARE, and DG, ICAR, New Delhi, Dr. P. S. Pandey, Vice-Chancellor, DRPCA, Pusa Dr. Praful Kumar Mishra, Chancellor, DRPCA, Pusa; Shri Ajay Nishad, Member of Parliament, Muzaffarpur, Smt. Veena Devi, MP, Vaishali and Shri Prince Raj, Member of Parliament, Samastipur.

- Museum was also inaugurated by Hon'ble dignitaries which depicts the rich history of Pusa for more than 200 years.

### Kisan Mela-2023

- The University Kisan Mela on the theme "Natural Farming and Nutri-Cereal Cultivation for Farmers Prosperity" was organized at DRPCA, Pusa campus during 23 to 25 February 2023.
- More than 7,500 Farmers from different parts of Bihar participated in this Kisan Mela. Five ICAR institutes from the State of Sikkim, Odisha, Madhya Pradesh, Uttar Pradesh and Bihar along with private organizations participated and displayed their technologies to educate the farmers, youths and school children.
- During the last one year, DRPCA seed unit has produced about 8796.76 q quality seed.
- Out Reach Programme: A total 2,685 trainings and programmes were organized for 77,518 beneficiaries.
- Skill development: Two ICAR sponsored Winter Schools were organized.
- About 470 casual manpower was exposed to skill development programme.

## Significant Achievements

### Patents Granted

- 1 Hand-cranked improved chakki (2022)
- 2 Hand tool for okra harvesting with collection hopper (2022)
- 3 Power-driven device for shelling and hulling of grains (2023)
- 4 Mushroom substrate pasteurizer (2023)
- 5 Rajendra Pusa Mushroom Samosa (2023)
- 6 Multi crop seeder (2023)
- 7 Energy giving nutritive food having balanced nutritional composition and process for preparation-2023

### Geographical Indication (GI)

'Marcha Dhaan' of West Champaran (Bihar) got the status of Geographical Indication. University facilitated the Marcha Dhan Utpadak Pragatisheel Samuh, to get the Geographical Indication status for the 'Marcha Dhaan' in co-ordination with the District Administration, West Champaran (Bihar).



### University-level rankings/awards

- 10<sup>th</sup> rank in MDRA-India Today Survey 2023 amongst all government general universities.
- 33<sup>rd</sup> rank in NIRF Ranking 2023 amongst top 40 universities in Agriculture and Allied Sector in India.
- Awarded with Certificate of Excellence for outstanding contribution in Mushroom.



### Student Achievement

DRPCA students have performed excellently well in sports and academics by qualifying national and international reputed competitions and bagging number of fellowships.

- One hundred twenty three students qualified for ICAR NET/CSIR NET and JRF.

- ICAR-AIEEE (PG)-2022 Fisheries; Mr. Vineet Anand -1st Rank; Ms. Yashwee -3rd Rank.



Anshika Rai

- Ms. Anshika Rai, secured All India Rank 1 in Graduate Aptitude Test in Engineering (GATE-2023).

- Ms. Ashwitha A. S., M.Sc. (Ag.) Agricultural Economics participated in XXI All India Agricultural University Sports and Games Meet 2022-23 at CCS HAU, Hisar, Haryana from 20-24 February 2023 and also won Silver and Bronze Medal.



Ashwitha A.S. Gowda

- Ms. Kashvi Kajal, Bachelor of Fisheries Science (2019-23) has been awarded with a prestigious fellowship "Erasmus Mundus Joint Master in Aquaculture, Environment and Society" from UHI-SAMS, Oban (Scotland, UK), University of Crete (Greece) and University of Nantes (France) for the year 2023-25.



Kashvi Kajal

### Placement record

The 100% placement was recorded at SAB&RM, RPCAU in MBA programmes. SABRM achieved 100% Placement with highest CTC to girl students at ₹ 9.50 LPA and ₹ 8.30 LPA for MBA Rural Management and MBA Agribusiness programmes. (Batch-2021-23) respectively.



PLACEMENT RECORD	
Average package	₹ 4.99 Lakh
Highest package	₹ 9.50 Lakh
Minimum package	₹ 3.00 Lakh
No. of companies	22
Total number of companies interested for placement	31
No. of students in waiting list	00
No. of students	94

### Faculty Achievement

- CAS promotion of 96 employees of DRPCA of various positions Assistant Professor, Associate Professor and Professor
- Dr. Bishnu Deo Prasad, Associate Professor, Department of Agricultural Biotechnology and Molecular Biology, CBS&H, Pusa has been selected for the prestigious SERB International Research Experience (SIRE) award for high-end research in the field of Gene Editing at John Innes Centre (JIC), Newyork, UK, a leading international centre of excellence in plant science for the year 2023-24.
- Mr. Vikas Kumar Rai, Assistant Professor, Soil Science has been selected for prestigious Netaji Subhash ICAR International Fellowship 2022-23 by the Government of India for pursuing Ph. D. programme from Remote Sensing in Hydrology and Agriculture laboratory at Michigan State University, East Lansing, MI 48824, USA.



Dr. Bishnu Deo Prasad



Mr. Vikas Kumar Rai

### Other Achievements

#### Symposium/Conference/Training

- ICAR sponsored winter school "adding value to primary and secondary produce (by products); Building Agricultural Enterprises in rural India via secondary agriculture" was organized during 10-30 November 2022.



## BODIES UNDER DARE AND THEIR ACTIVITIES

- ICAR Sponsored Winter School on “Innovative Approaches to Agripreneurship: Ideation to Implementation” was organized from 7 to 27 January 2023 by School of Agri-Business and Rural Management.
- National Symposium on “Climate Change and Plant Diseases” and Zonal Meeting (Eastern Zone) of Indian Phytopathological Society was organized during 23- 24 January 2023 in offline/online mode with participation of more than 100 scientists during the event.

### Research Publication (NAAS rating > 15)

- Nancy A Eckardt, Elizabeth A Aionsworth, Rajeev N Bahuguna, Martin R Broadley, Wolfgang Busch, Nicholas Carpita, Granbriel Castrillo, Joanne chory lee R DeHaan, Carlos M Duarte, Ameia Andrew DB Leakey, James C Liao, Maureen C McCann, Damaries A Odeny, J Damioen Platten, Ismail Rabi, Ellen Youngsoo Rim, Pamela C Ronalso, David E Salt, Alaxandra M Shigenaga, Ertao Wang, Marnin Wolfe, 07/10/2022. “Climate Change Challenges Plant: Science Solution”. *The Plant Cell* (NAAS rating 18.79).

### Release of sugarcane variety Rajendra Ganna-5 by CVRC

Rajendra Ganna-5 (CoP 11438), an early maturing variety having average cane yield over the 6 locations in four states namely UP, Bihar, WB and Assam were 79.38 t/ha and average sucrose 17.90% was released and notified by Central Seed Sub-Committee on Crop Standards and Release of Variety (CVRC).



## Varieties/Technology Release during 13 and 14<sup>th</sup> Research Council Meeting

### Varieties

1. Rajendra Ganna-6 (CoP 15437)  
Maturity group: Early  
Average yield: 105.00 t/ha  
Sucrose in juice: 17.90%



2. Rajendra Ganna-7 (CoP 022)  
Maturity group: Mid late  
Average yield: 95.00 t/ha  
Sucrose in juice: 17.62%



## 3. Rajendra Chana-2 (DC 17-1111)

Parentage	:	(ICC 4958 x ICCV 93954) x (ICCV 96970 x ICCV 97105)
Duration	:	110-115 days
Season	:	<i>Rabi</i> (sowing time: 15 October - 30 November)
Average yield	:	2,200 – 2,500 kg/ha
Protein content	:	18.95
Disease Reaction	:	Resistant to moderately resistant against wilt
Pest Reaction	:	Below economic threshold level infestation of pod borer under normal plant protection condition

## 4. Rajendra Chana - 3 (DMHC 18-1664)

Parentage	:	ICC 4958 TM x JG 130
Duration	:	130-135 days
Season	:	<i>Rabi</i> (sowing time: 15 October - 30 November )
Average yield	:	2,300 – 2,600 kg/ha, Plant height: 80-103.2 cm
Special feature	:	Well suited for mechanical harvesting
Protein content	:	18.65
Disease reaction	:	Resistant to moderately resistant against wilt and dry root rot
Pest reaction	:	Below economic threshold level infestation of pod borer under normal plant protection condition

## AWARD and RECOGNITION, KVK, PIPRAKOTHI

S. No.	Name of Awardee	Name of Award	Source of Award Received
1.	KVK, Piprakothi	Best KVK Award	DRPCA, Pusa by the Vice Chancellor on the occasion of Republic Day 2023 (26 January 2023)
2.	KVK, Piprakothi	Best KVK Award under Fund Mobilization Category	6th Annual Zonal Workshop of KVKs of Zone-4 during 8-10 July 2023 held at Ranchi, Jharkhand

# RANI LAKSHMI BAI CENTRAL AGRICULTURAL UNIVERSITY (RLBCAU), JHANSI

Rani Lakshmi Bai Central Agricultural University was established as an Institution of National Importance in 2014 with focus on holistic agricultural development of Bundelkhand region in particular and nation in general. The holistic model of agricultural education, research and extension offers refreshingly new perspectives to young minds to nurture and facilitate their creative talent. The main campus of RLBCAU is spread over 300 acres of land at Jhansi having two colleges, viz. College of Agriculture and College of Horticulture and Forestry. College of Veterinary and Animal Sciences, and College of Fisheries are established at second campus at Datia, Madhya Pradesh with 187.5-acres farm. College of Horticulture is being developed at Morena, Madhya Pradesh on 297 acres of land.

Within a short span of journey, the University has made unprecedented growth in all the spheres of its mandated activities in academics, research and extension education including development of state-of-the-art infrastructure. The University took several initiatives to foster sustained growth and quality outcomes by improving efficiency, infrastructure, instruction materials, laboratories and human resources.

## Academic Activities

### Curricular Activities

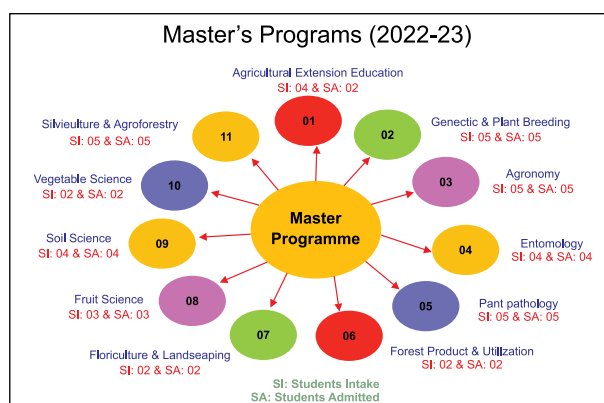
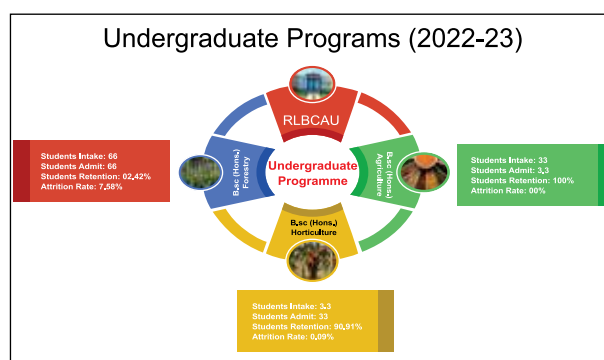
The RLBCAU has the phenomenal distinction of imparting education and conducting research and disseminating implementable technologies in agriculture and allied disciplines. The University has successfully equipped itself to meet the challenges of present-day education-creating a complete system of knowledge production, processing and dissemination. The University offers a full spectrum of programmes at the undergraduate level namely, B.Sc. (Hons) Agriculture, B.Sc. (Hons) Horticulture, B.Sc. (Hons) Forestry, B.Sc. (Hons.) Natural Farming, B.V.Sc & A.H. and B.Sc. (Hons) Fisheries and at the Postgraduate level such as, M.Sc. in Agronomy, Entomology, Genetics & Plant Breeding, Plant Pathology, Soil Science, Fruit Science, Vegetable Science, and Silviculture and Agroforestry. Besides, three new PG programmes in Agricultural Extension

Education, Floriculture and Landscaping, Forest Product Utilization with an intake capacity of 2-5 seats and five PhD programmes in Genetics and Plant Breeding, Agronomy, Plant Pathology, Fruit Science, Silviculture and Agroforestry with 2 seats in each discipline have also been started from the academic session 2022-23.

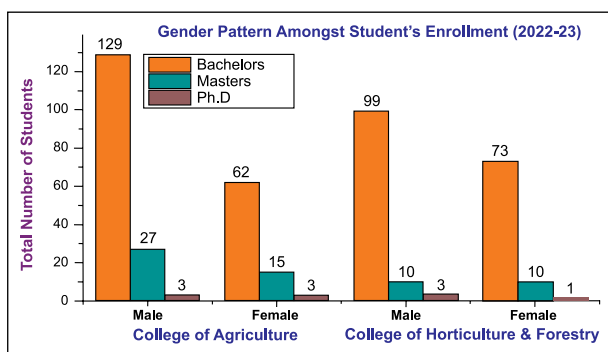
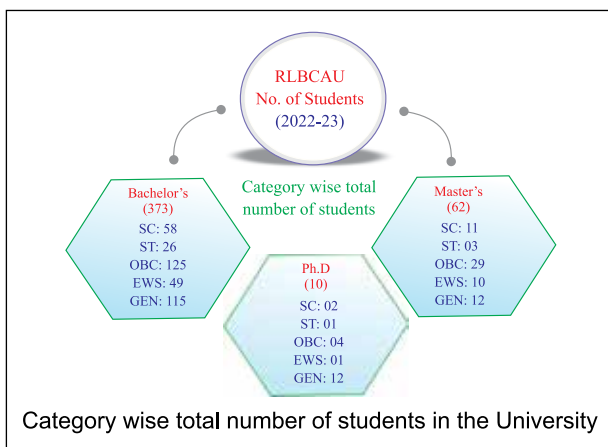
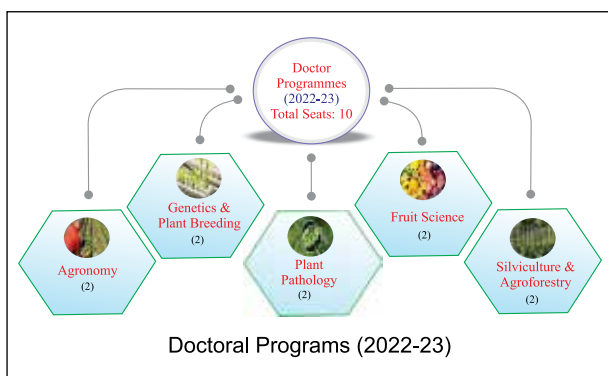
Admission to all the UG/PG programmes is made through highly competitive All India Entrance Examinations within the statutory framework of the reservation policy of the Government of India with a minimal attrition rate of UG/PG students.

During the period under report, the University fetched one DBT-supported Post Graduate Programme (M.Sc. Agricultural Biotechnology) for teaching and training. The two constituent colleges, viz. College of Agriculture and College of Horticulture and Forestry of the University has been accredited by the ICAR-National Agricultural Education Accreditation Board (NAEAB). All final-year undergraduate and PG students completed their degree requirements within the stipulated timeframe.

### Students' Profile







## Students Placement

### Number of Students Selected for JRF/SRF/NET (ICAR/ICMR/ UGC/CSIR/DBT)/ARS in 2022-23

JRF	SRF	NET	ARS	Others	Remarks
10	01	13	-	5	-

## Co-curricular activities

The University provides a very healthy and conducive environment for co-curricular activities and for overall development of students and faculty members. The faculty and students participated in Swachh Bharat Abhiyan, National Social Service, National festivals, games and sports, Hindi Diwas (Hindi Pakhwara) and other extra-curricular activities. The University celebrated around 25 national/international days i.e. Gandhi Jayanti, World Wildlife Week, World Food Day, National

Unity Day, Rani Lakshmi Bai Birthday, Agricultural Education Day, World Soil Day, Kisan Diwas, National Youth Day (Swami Vivekananda Birthday), Birth Anniversary of Netaji Subhas Chandra Bose (Parakram Diwas), Republic Day, Martyr's Day, National Science Day, Foundation day of RLBCAU, International Women's Day, World Forestry Day, World Environment Day, International Yoga Day, Van Mahotsav, Independence Day, National Sports Day, Teachers' Day for co-memorizing their importance and remembering Nation's Heroes, Prides and Glories.

The team of faculty and students was selected at National level Hackathon 3.0 on Speed Breeding "KRITAGYA" and also in Smart Jhansi Rise





Incubation Centre for their novel ideas and thoughts for the development of Agri-Entrepreneurship.

### Accreditation of Academic Programs

The Peer Review Team led by Prof. J. S. Sandhu, the former DDG (Crop Science) along with members visited the University headquarters, constituent colleges, departments, research farms and various available facilities and units during 23-25 May 2023. During their 3-day stay, the PR Team interacted with the statutory authorities, faculty members, staff, students as well as the farm labourers and collected feedback from them. The PR Team was highly satisfied with the available resources and the competence of faculty members and they awarded the accreditation for the Post-graduate in Plant Pathology, Soil Science and Entomology disciplines in Agriculture College and the M.Sc. programme in Fruit Science in College of Horticulture and Forestry.

### Research Activities

#### Implementable technologies

- Ridge and furrow planting system is practically feasible method to grow maize and sorghum crops in *kharif*. This method ensures better moisture retention and saves comparatively more water under *in-situ* rainwater harvesting systems.
- Maize-mustard-sesbania cropping system maximized the system productivity and fetched more net returns as compared to prevailing cropping system of fallow-Gram/Wheat/Mustard.
- The application of two foliar sprays of Azoxystrobin 23 SC @ 0.5 ml lit<sup>-1</sup> effectively controlled the *Corynespora* leaf spot by reducing disease severity in mungbean resulting



the better crop yield.

- Management of common bacterial blight of mungbean: Two sprays either of *Bacillus subtilis* or *Pseudomonas fluorescens* @ 4 g/litre of water has been identified as the effective bactericide and it replaces streptomycin sulphate 90% w/w + tetracycline 10% w/w.
- Management of early leaf spot and leaf scorch in groundnuts: Two sprays with Azoxystrobin for reduction of early leaf spot in groundnut and hexaconazole to reduce leaf scorch in groundnut.
- Two sprays of emamectin benzoate 5% SG @ 0.4 g/litre of water is recommended for effective management of fall army worm in maize at an interval of 15 days or when larvae population crosses the ETL.
- The incidence and severity of *Helicoverpa armigera* in chickpea crop can be effectively managed when the chickpea is intercropped with marigold in 5:1 row ratio.
- The fungal diseases in mustard particularly, Alternaria blight, white rust and powdery mildew can efficiently minimized by tank mixed application of Tebuconazole 50% + Trifloxystrobin 25% WG @ 0.1%.
- Under High Density Planting in guava, 25% shoot pruning is recommended in variety L-49 for higher yield and best fruit quality having high TSS content.



- In African marigold var. Punjab Gainda-1 is found suitable for commercial cultivation in Bundelkhand region with highest number of flowers/plant and maximum flower yield per ha.
- Turmeric var. NDH-98 is recommended for commercial cultivation having maximum yield under Bundelkhand region.

## Extension Activities

### Technology assessment and refinement

- The University has developed a package of practices for groundnut, blackgram, aerobic rice and tomato, and hybrid maize by validating and refining it at the farmers fields in the Bundelkhand region.
- The technology refinement work on elephant foot yam and millets were initiated.
- The potential fruits, vegetables and agroforestry species, animal health management practices, composite fish culture, and promotion of income-generating activities like apiary, and mushroom cultivation has been introduced.



- The University has adopted approaches like FPO-Interface for the transfer of technology and utilization of local newspapers, ICT etc. for farm advisory dissemination.

### Technology dissemination-front line demonstrations

During the reporting year, a total of 1,515 FLDs were conducted covering an area of 590 ha benefitting more than 10,000 farmers of the Bundelkhand region. The FLDs were conducted to demonstrate the recently developed production technologies for crops like rice, wheat, maize, blackgram, chickpea, sesame, groundnut, mustard, tomato, potato, okra, brinjal, dragon fruit, papaya, fig, strawberry etc.

In addition to this, farm implements like sprayers were distributed among 111 farmers of Jhansi and Lalitpur districts under SCSP projects.

### Training Programmes

During the year 17 training programmes were organized by the University benefitting more than 1,000 trainees directly. Of these, 352 were rural women and 428 were youth. Out of 17 training programmes, 6 were conducted in the domain of field crop production, whereas others were related to medicinal crop cultivation, agroforestry, horticulture, beekeeping, mushroom cultivation, goatery etc. Among field crops, the major emphasis was placed on pulses and oilseed crops, considering the production potentiality in the region. A total of





## BODIES UNDER DARE AND THEIR ACTIVITIES



150 farmers were trained in the scientific production of pulses and oilseeds.

### Dissemination of agro-advisories

For the benefit of farmers, the University provided advisories to the farmers regularly through local print media. A total of 278 agricultural advisories



### University Publications

Research Papers	Popular Articles	Books	Book Chapters	Technical Bulletin	Practical & Study Manuals/ Pamphlets
60	37	10	52	25	32

in the field of NRM (61), crop science (52), animal science (21), horticulture (22), fruit science (23), forestry (22), social science (28), vegetable (31), and fruits (18) were published in the 21 newspapers of the region.

### Workshops and Stakeholders' Engagement

Workshop on Strengthening Export Potential of Cereals in Bundelkhand Region was organized at the RLBCAU on 10 December 2022 in collaboration with ICAR-IIWBR, Karnal; SAWBAR, Karnal; and APEDA, New Delhi. Kisan Samman Nidhi Programme was live telecasted among more than a hundred farmers of the Bundelkhand region on 17 October 2022.

Under the joint auspices of Bhartiya Agro-Economic Research Center (BAERC), New Delhi and RLBCAU, Jhansi, a two-day workshop on "Indian Agriculture-Challenges and Opportunities" was organized during 14 to 15 January 2023 at RLBCAU where more than 50 participants discussed the challenges and possibilities of Indian agriculture.



### Seminar Workshops and Training Programmes

As part of the HRD development, over the past year, a significant number of our dedicated faculties have actively participated in a multitude of seminars, symposia, and training programmes, held across the country and the University itself, designed to enhance their skills and knowledge. This collective engagement underscores our unwavering dedication to academic excellence and ensures that our faculty members remain at the forefront of their respective fields, enriching both their teaching and research endeavours.

Seminars/Symposia	Workshops	Trainings	Awards
32	29	28	12



### Capacity Building Programme/Training

A 10 days High-End workshop on “Hands on training on Physiological and Bio-molecular Techniques for Crop Improvement” was organized during 3 to 12 July 2023 sponsored by DST-SERB, New Delhi with the objectives to introduce the participants about the importance of modern physio-molecular tools and their relevance in crop improvement besides to help in PG/Ph D degree programme in plant science including agriculture.



### Major Events/Outreach Programmes

- **Atal Jai Vigyan Lecture Series** - Since 2018, RLBCAU, Jhansi has been organizing the “Atal Jai Vigyan” lecture series to give our heartfelt tribute to our former Prime Minister Shri Atal Bihari Bajpayee, in which eminent scientists, researchers and teachers delivered lectures for the benefits of students and faculty as a part of the development of quality human resources



development. To date, 25 lectures have been delivered and from October 2022 to September 2023 three eminent personalities delivered lectures under this popular lecture series.

- **Kisan Mela 2023** - RLBCAU, Jhansi has organized its first “Kisan Mela” during 26-27 February 2023 on the theme of “बुंदेलखंड में कृषि निर्यात एवं पोषक अनाजों (श्री अन्न) की संभावनाएँ” (Bundelkhand me Krishi Niryaat evam Poshak Anaajo (Shree Ann) (millets) ki Sambhabnayen). Eleven progressive farmers of UP and MP were honoured with certificates of appreciation for their excellent performance in the fields of agriculture and allied sectors. A total of more than 80 technology stalls were set up by different educational, research institutions and non-governmental agencies. Apart from this University participated in more than 10 exhibits showcasing recent technology developments in the University.



- **Bundelkhand Agri-Export Promotion Summit (2023)** - It was organized on the theme "Strengthening Value Chain and Export potential of Bundelkhand Agri-produce" through the synergy of NABARD, FPOs and APEDA. A sensitization programme (APEDA) for the local farmers, youths, self-help groups, FPOs, food business operators, and entrepreneurs for the business opportunities





in the Bundelkhand region (27 February 2023).

- Second Convocation** - The Rani Lakshmi Bai Central Agricultural University (RLBCAU), Jhansi, celebrated its 2<sup>nd</sup> Convocation with great pomp and grandeur on the 11 March 2023. The Convocation was a momentous occasion for the university, marking the culmination of academic excellence and the beginning of a new chapter in the lives of its graduates. The convocation ceremony was graced by several distinguished guests, including the Chief Guest Shri Narendra Singh Tomar, Former Minister of Agriculture and Farmer's Welfare, Government of India. Also present were Dr. Himanshu Pathak, Secretary (DARE) and Director General (ICAR), Dr. Panjab Singh, Chancellor, RLBCAU, Jhansi, Dr. Ashok Kumar Singh, Vice Chancellor, RLBCAU, Jhansi and other prominent members of the University administration, faculty, staff, and students. Total



213 students were conferred undergraduate and postgraduate degrees, out of which 88 students with B.Sc. (Hons.) Agriculture, 36 students with B.Sc. (Hons.) Horticulture and 35 students with B.Sc. (Hons.) Forestry and 59 students with M.Sc. Degrees in different disciplines. Also 16 students were awarded with Gold medals in different course programmes.

- Eleventh VC Conference** - Given the natural resource degradation issues and further emerging challenges as well as the opportunities, the 11th Brain Storming Session on "Innovation in Sustainable National Resource Management" was held at the Rani Lakshmi Bai Central Agricultural University, Jhansi on 7-8 April 2023. The programme was organized under the aegis of the Indian Association of Agricultural Universities, New Delhi, and attended by the Vice Chancellors of Agricultural Universities,







Deputy Directors General of the ICAR, Deans and Directors of research and academic institutions.

### Infrastructure Developed

An academic cum administrative building of the college is already constructed and also furnished with modern amenities. The class rooms and examination/seminar halls of capacity of 150 and 100 along with one library, computer labs, well-equipped research laboratories furnished with the modern facilities, hostels for both boys and girls accommodating up to 250 students each, residential accommodations and one multipurpose cum auditorium hall with 250 seating capacity are available in Datia campus.



At Jhansi campus, the addition of new guest house of 35 rooms and community centre having provision of bank and different shops for fulfilling the students' need have been created.

### Central Instrumentation Facility (CIF)

A university level Central Instrumentation Facility (CIF) equipped with cutting-edge instruments and equipment such as high-performance liquid chromatography (HPLC), gas chromatography (GC), atomic absorption spectrometry (AAS), and microscopy, among others catering to the diverse needs of researchers in the fields of agriculture, life sciences, biotechnology, and environmental science, was inaugurated by Dr.







Trilochan Mahapatra, former secretary (DARE) and DG (ICAR) on 05 March 2023 in the presence of the Vice Chancellor Prof. A.K. Singh including Dr. Anil Kumar, Director Education and other Deans and Directors.

### Mobile Plant Health Clinic

The knowledge, agri-practices and technology for crop protection and soil fertility management were disseminated through Mobile Plant Health Clinic at the doorsteps of farmers. Promotion of science based Natural farming in the Bundelkhand was done.



### Promotion of Digital Agriculture and Agri-Entrepreneurship

**Agriscap 2023** - To empower youth and enable them towards entrepreneurship Rani Lakshmi Bai Central Agriculture University in collaboration with Jhansi Smart City and Medha Learning Foundation has organized Agriscap 2023. Agriscap is an agribusiness idea competition, where they are trying to nurture young minds and their ideas of becoming an entrepreneur, through a journey filled with experiences and processes and refine their idea into a valuable business model (23 March 2023).



### Development of “Bundeli Krishi Vipnan” Mobile App

The outcome of the project “Integrated Platform for Agri-preneur: A Force Multiplier Forum of Farmers-Consumers-Entrepreneur,” funded by the National Bank for Agriculture and Rural Development (NABARD) is the “Bundeli Krishi



Vipnan” mobile app which is an ICT-enabled integrated platform to connect Farmer Producer Organizations (FPOs), Self-Help Groups (SHGs) and Agri-preneurs within three districts - Jhansi, Lalitpur, and Jalaun and it is facilitating backward and forward linkages between sellers and buyers, with an emphasis on increasing the visibility of farm products produced by primary producers, FPO, SHGs, and Agri-preneurs.

### Development of AI-DISC Android Mobile App

AI-DISC Android Mobile App developed and launched on 09 February 2023 in collaboration with ICAR-IASRI, New Delhi under NIBPP Mobile App-NAHEP Comp-2 funded by ICAR having a total 20,944 images of different diseases/insect-pests of mustard, groundnut, sesame, pigeon pea, chickpea, mungbean, urdbean, pea, lentil were annotated and uploaded on NIBPP portal for identification of image based causative pathogens and diseases.

### Organization of different sensitization programmes for Agri-entrepreneurship development

- Development of Soft Skills for Entrepreneurship among Agri Graduates on 04 March 2023 under the auspices of NAARM, Hyderabad was carried out.
- Entrepreneurship Awareness Programme on 15 October 2022 under the auspices of MSME-DFO, Kanpur was conducted.

### MOUs Signed with Different Institutes/ Organizations

The collaborative agreements with aim to facilitate the exchange of knowledge, expertise, and resources between the two institutions, fostering a synergistic environment for academic and research activities were signed.

- **MOU between RLBCAU and TFRI (08 December 2022)** - Rani Lakshmi Bai Central Agricultural University, Jhansi, has taken a

significant stride in enhancing academic and research endeavours by signing a Memorandum of Understanding (MOU) with the renowned Tropical Forest Research Institute, Jabalpur.

- **MOU between RLBCAU and Tara Blooms Pvt Ltd (27 February 2023)** - Rani Lakshmi Bai Central Agricultural University in Jhansi has embarked on a transformative journey by signing a forward-looking Memorandum of Understanding (MOU) with Tara Blooms Pvt Ltd a social enterprise. This strategic alliance is poised to empower the farming community and enterprises of all scales, from micro to large, in navigating the challenges of today's agricultural landscape through the effective deployment of technology.
- **MOU between RLBCAU and ICAR-CRIDA, Hyderabad (08 April 2023)** - Rani Lakshmi Bai Central Agricultural University, Jhansi, has taken a significant stride in enhancing academic and research endeavours by signing a Memorandum of Understanding (MOU) with Central Research Institute for Dryland Agriculture, Hyderabad (Telangana).
- **MOU between RLBCAU and Sanskriti University, Chhata, Mathura (16 May 2023)** - Rani Lakshmi Bai Central Agricultural University, Jhansi, has signed a Memorandum of Understanding for collaboration in the fields of academic and research endeavours with Sanskriti University, Chhata, Mathura.
- **MOU between RLBCAU and National Horticultural Research and Development Foundation, New Delhi (NHRDF) (14 July 2023)** - Rani Lakshmi Bai Central Agricultural University, Jhansi, has signed a Memorandum of Understanding for creation of need based research programme for development of varieties, production and protection technologies in horticultural crops particularly onion and garlic and transfer of technologies in Bundelkhand with National Horticultural Research and Development Foundation, New Delhi (NHRDF).

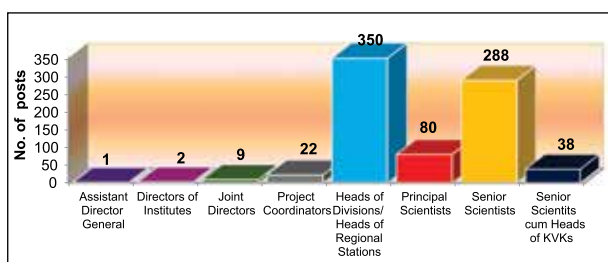


## AGRICULTURAL SCIENTISTS RECRUITMENT BOARD

ASRB has always strived to identify and recommend the most talented individuals according to ICAR's specific requirements. The accomplishments of ASRB for the 2023-24 period are particularly noteworthy, as it signifies the historic milestone of conducting interviews for one hundred and eight Research Management Positions (RMPs) and advertised 790 RMPs and Non-RMP posts for the first time in ASRB's history.

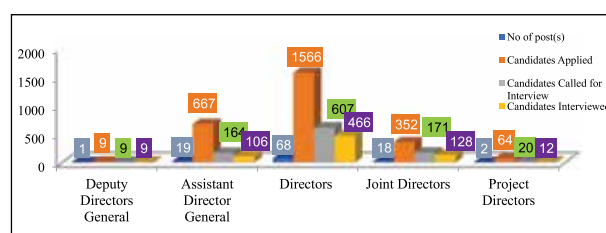
### Direct Recruitment/Lateral entry

During the period, the Board released four advertisements (Advt. No. 2/2022 dated 3 October, 2022, Advt. No. 1/2023 dated 17 May 2023, Advt. No. 2/2023 dated 10 July 2023 and Advt. No. 3/2023 dated 7 August 2023 for direct recruitment of 790 RMPs and Non-RMP posts. These positions included Assistant Directors General, Directors of Institutes, Joint Directors, Project Coordinators, Heads of Divisions/ Heads of Regional Stations, Principal Scientists, Senior Scientists, Senior Scientists cum Heads of KVKs

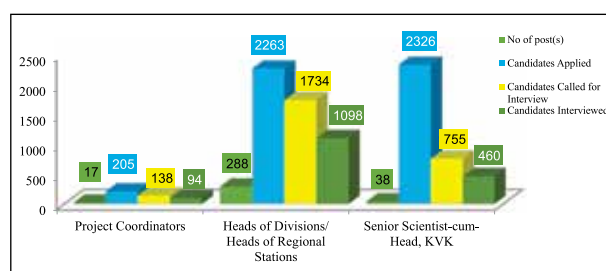


Project Coordinators, Heads of Divisions Heads of Regional Stations, Senior Scientists cum Heads of KVKs and Senior Scientists. The breakdown of the position-wise distribution of the various posts advertised during the period is illustrated here.

The Board successfully concluded the interview process for a total of 451 posts. These positions included one Deputy Director General, 19 Assistant Directors General, 68 Directors, two Project Directors, 18 Joint Directors, 17 Project Coordinators, 288 Heads of Divisions Heads of



Research Management Posts



Non-Research Management Posts

### Summary of Direct Recruitment process completed during the period

Category	No. of post (s)	Candidates Applied	Candidates Called for Interview	Candidates Interviewed
<b>Research and Management Positions</b>				
Deputy Director General	1	9	9	9
Assistant Director General	19	667	164	106
Director	68	1566	607	466
Joint Director	18	352	171	128
Project Director	2	64	20	12
Total (A)	108	2568	971	721
Per post availability of candidates (A)		23.78	8.99	6.68
<b>Non-RMP positions</b>				
Project Coordinators	17	205	138	94
Head of Division/ Head of Regional Station	288	2263	1734	1098
Senior Scientist-cum-Head, KVK	38	2326	755	460
Total (B)	343	4794	2627	1652
Per post availability of candidates (B)		13.98	7.66	4.82
<b>Overall (RMP + non-RMP)</b>				
Total (A+B)	451	7362	3598	2373
Per post availability of candidates (A+B)		16.32	7.98	5.26



View of Interview Board

Regional Stations of Institutes and 38 Senior Scientists-cum-Heads, KVKs.

Overall, the Board carefully reviewed and screened a total of 7,362 applications and shortlisted 3,598 candidates for interviews. Out of the shortlisted candidates, 2,373 individuals attended the interview sessions.

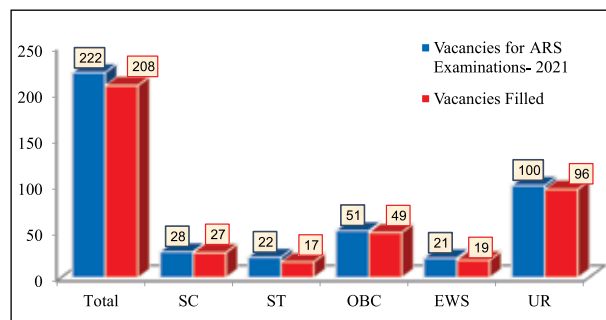
According to the established guidelines, the Board extends interview invitations to the top 10 ranking candidates who obtain the minimum qualifying marks in the scorecard evaluation for each post. However, on an average, approximately 6.68 candidates were available for RMP positions and 4.82 candidates for Non-RMP positions for interviews per post.

## Recruitment through Examination

### ARS Examination-2021

Based on the result of ARS (Preliminary) Examination, a total of 2,792 candidates qualified for the ARS main examination, out of these only

2,437 candidates actually appeared in the ARS main examination. The Agricultural Research Service (Main) examination, conducted by ASRB on 28 November 2021, was followed by Viva-voce held from 9 to 20 December 2022. As a result of this process, a total of 208 candidates across 47 disciplines have been recommended for entry-level scientific posts under ICAR.



Category wise breakup of candidates recommended in ARS examination



View of ARS Viva –Voce Board in progress

## BODIES UNDER DARE AND THEIR ACTIVITIES

Among the advertised 222 vacancies, recommendations were made for only 208 posts due to the unavailability of suitable candidates. Category wise breakup of candidates recommended in ARS examination is shown in the illustration.

### Administrative Officer (AO) and Finance & Accounts Officer (F&AO) Examination- 2021

The Tier-I examinations (objective test) for Administrative Officer and Finance & Accounts Officer, were conducted on 10 May 2022 and 21 May 2022, respectively, aimed to fill up vacant positions for Administrative Officer (AO) and Finance & Accounts Officer (F&AO) in ICAR. A total of 882 candidates qualified for the post of Administrative Officer, while 421 candidates qualified for the post of Finance & Accounts Officer, progressing them to the Tier-II examination. The Tier-II examination (Descriptive Test) was conducted in the conventional pen and paper mode from 28 to 30 December 2022 across the country. Based on the result of Tier-II examination, a total of 241 candidates qualified for interview for the post of Administrative Officer and 107 for the post of Finance & Accounts Officer.

### Combined examination for National Eligibility Test (NET)-2023, Subject Matter Specialist (SMS; T-6) and Senior Technical Officer (STO; T-6) examination-2023

A combined examination for National Eligibility Test (NET) – 2023, Subject Matter Specialist (SMS; T-6) and Senior Technical Officer (STO; T-6) examination-2023 was held in online mode from 27 -30 April 2023 aimed to fillup 163 posts of Subject Matter Specialist (SMS; T-6) in KVKs and 30 posts of Senior Technical Officer (STO; T-6) in ICAR institutes.

### National Eligibility Test (NET)-2023

A total of 62,573 candidates registered for the National Eligibility Test and 53,633 candidates appeared in the examination. Based on the result, 8,264 candidates qualified for NET certification in 60 disciplines.

### Subject Matter Specialist (SMS; T-6) and Senior Technical Officer (STO; T-6)

A total of 23,539 candidates registered for the Subject Matter Specialist (SMS; T-6) and Senior

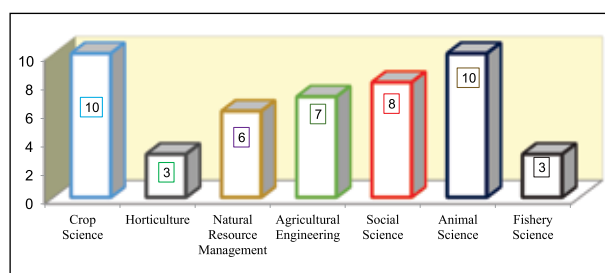
Technical Officer (STO; T-6) examination. A total of only 19,481 candidates appeared in the examination and 871 candidates qualified for interview.

### ARS Examination – 2023

A notification has been issued regarding conduct of Agricultural Research Service (ARS)-2023 examination for the recruitment of 260 positions of scientists in 51 disciplines. The examination will be held in conventional pen/paper mode at 19 centers across India.

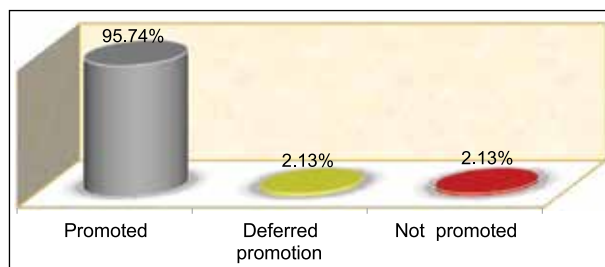
### Assessment/Promotion of Senior Scientists under Revised Career Advancement Scheme

During the year, 47 proposals in 26 disciplines were received from different ICAR institutes for promotion/assessment from Senior Scientist to the grade of Principal Scientist under revised Career Advancement Scheme (CAS). Out of which 47 proposals were assessed and its recommendations were sent to the Council. Major discipline wise breakup of CAS proposals is as follows:



Major discipline wise breakup of proposals assessed

The evaluation of 47 cases showed that 95.74% of the candidates were promoted at the scheduled time, 2.13% were received deferred promotion to the next higher grade, and in the remaining cases no promotion to the next higher grade could be made.



Assessment of Senior Scientists to the grade of Principal Scientists under Career Advancement Scheme (CAS)

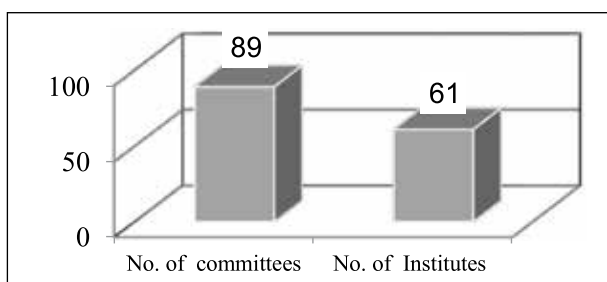


### Career Advancement Scheme (CAS) for ARS Scientists (RGP 6000 to 9000) and Assessment Promotion of Technical Personnel

In accordance with the scheme and rules of Career Advancement Scheme (CAS) for ARS Scientists, the Chairman, ASRB nominated Chairman of various assessment committees to consider the cases of promotion of scientists in the ICAR institutes. Besides this, nominations were also made by the Chairman, ASRB for constitution of assessment committees for considering the promotion cases of technical cadre staff working in ICAR Headquarters. and its institutes across India.

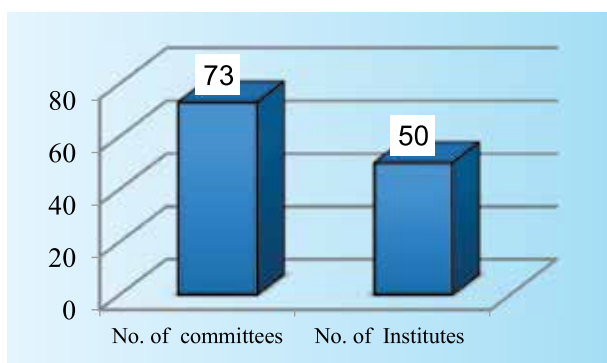
#### Assessment/Promotion of Technical Personnel

The Board nominated experts for 89 assessment committees for promotion of technical staff in 61 institutes including ICAR Headquarters.



#### Assessment/Promotion of Scientists

The Board finalized and notified nomination of experts for 50 institutes for constitution of 73 Departmental Promotion Committees (DPCs) for assessment of scientists from RGP ₹6,000 to ₹7,000 from RGP ₹7,000 to ₹8,000 and from RGP ₹8,000 to ₹9,000.



### Reforms

**Revision of Scorecard-2022:** During the year, the scorecard for direct selection to Non-

RMP Positions through lateral entry in ICAR has undergone a comprehensive revamp to enhance its objectivity.

**Revision of Application Form the post of Head of Division (HOD)/Head of Regional Station (HoRS)/Project Coordinator (PC), Principal Scientist and Senior Scientist:** Online application forms for direct recruitment for non-RMP positions have been revised in consonance with revised scorecard and were made applicable from Advt. No. 02/2022. Web based application software has been developed to apply online and for screening of applications as per the revised scorecard. The application software is named as OASIS (Online Application and Scorecard Information System) and can be accessed online on URL-<https://asrbapplication.in>.

**Progressive use of Hindi:** ASRB is committed to promoting the progressive use of Hindi in its office, in accordance with the targets set forth in the Annual Official Language Programme 2023-24, as per the Official Language Policy of the Department of Official Language, Ministry of Home Affairs, Government of India. The Board ensures strict adherence to the provisions of the Act and Rules, ensuring that circulars, reports, question papers, and other documents meet the bilingual requirements.



View of Hindi Quarterly Meeting

**Quarterly meetings of Official Language Implementation Committee (OLIC):** Regular quarterly meetings of the Official Language

## BODIES UNDER DARE AND THEIR ACTIVITIES



Hindi Saptah Inauguration Ceremony



Hindi saptah Valedictory Function



View of Prize Distribution during Hindi Saptah Valedictory function



Implementation Committee (OLIC) have been conducted under the chairmanship of the official language implementation committee, who serves as the Nodal Officer for implementing the official language policy within the Board. Four meetings were held, i.e. in December 2022, and March, June, August 2023 where various issues related to official language implementation were discussed and decisions were made. The chairman of the committee always motivated the employees to achieve 100% target.

**Quarterly Report on Official Language Implementation:** The quarterly report of ASRB for

the period ending 30 June 2023 demonstrates the following:

- The performance of official language implementation under Section 3 (3) was 100%. Additionally, the replies to letters sent by ASRB to A and B regions were also 100%.
- Correspondence in Hindi with region A was 97% while in region B and C was 100%. The target for region C was 65%.

Overall performance in noting in Hindi was 95.68%, surpassing the set target of 75%.



### Reports related to Official Language Policy

- Quarterly Progress Reports regarding use of Rajbhasha in the Board have been sent to the Department of Official Language, Ministry of Home Affairs, Government of India.
- Annual Assessment Report and Quarterly Progress Reports regarding use of Rajbhasha in the Board have been sent to the Department of Agricultural Research and Education (DARE).
- Half yearly progress reports regarding use of Rajbhasha in the Board have been sent to the Town Official Language Implementation Committee (TOLIC), North Delhi.

**Celebration of Hindi Saptah:** During the year, “Rajbhasha-Hindi Saptah” was celebrated from 19 to 27 September 2023. The inauguration of Hindi Saptah took place on 19 September 2023, in the presence of Chairman, Members, Secretary, ASRB and Chairman, Official Language Implementation Committee (OLIC) and all other officers and staff of ASRB. Chairman, ASRB, presided over the event. In his address, he emphasized the importance

of promoting the progressive use of Hindi in the office to achieve the goals set in the Annual Official Language Programme 2023-24.

During the Hindi Saptah, six competitions were conducted, emphasizing different aspects of Hindi usage. These competitions included Essay Writing, Noting and Drafting, Poem Recitation, Anecdote Writing based on photographs, Typing tests, and Prashnottari pratiyogita. A total of 62 participants enthusiastically took part in these events. The Chairman of the Official Language Implementation Committee (OLIC) provided all the necessary support and continuous encouragement to successfully organize these competitions during Hindi Saptah.

The valedictory function took place on 27 September 2023. Chairman, ASRB, presided over the function. He appreciated the successful organization of Hindi Saptah. Cash prizes and certificates were given to the winners by the Chairman, Member (AS) and Secretary, ASRB.



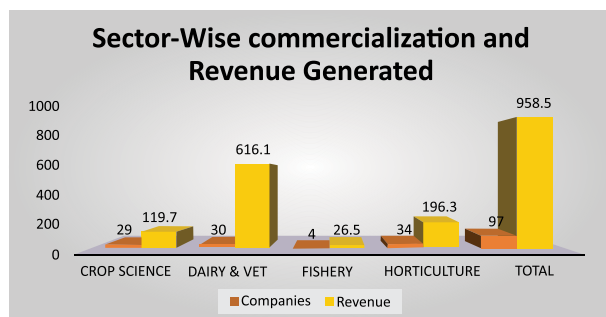
# AGRINNOVATE INDIA LIMITED

## Performance at glance

AgrInnovate India Limited (AgIn), a Government of India enterprise, is steadily moving towards meeting its objective of stimulating and fostering innovations in agriculture and building 'A world of Innovative Partnerships'. It works as an important interface between the research institutes and the Agri-industry and promotes technology commercialisation through licensing for domestic and international clients. The Company has significantly increased its gross revenue during the period under report. With standardized protocols, AgIn has helped several ICAR institutions, Industry and farmers as end stakeholders by transferring around 123 technologies during the financial year 2022-23.

The guidelines for commercialization of technologies developed under ICAR and Institutions under the National Agricultural Research System (NARS) have been harmonized with AgIn thereby widening the scope for commercialization cutting across disciplines/sectors. Agrinnovate India Limited is now in a certain position to take advantage of the new opportunities for enhancing and catalysing innovation and capacity driven agricultural development through partnerships.

The Company has efficiently handled partnerships with several ICAR institutes and private companies. The company's revenue from operations touched ₹ 10.01 crores (excluding taxes and including royalty of ₹ 43 lacs). These technologies emerged from crop science (12.49%), dairy and veterinary sciences (64.27%), horticulture (20.47%) and fisheries (2.76%).



## Business Development Activities

Constant and continuous efforts by CEO, AgIn and team resulted in widely expanding the business opportunities for the Company and nearly more than 600 technologies from 59 institutes

and 4 universities have been added to the list of technologies ready for commercialization through Agrinnovate.

## Promotional Activities

AgIn undertook several initiatives as part of the Business Development Programme to promote its services to various stakeholders and also several bodies invited AgIn as an expert for policy deliberations and capacity building activities. Significant among these are given below:

### 1. ICAR-Industry-Stakeholder Consultation Meets

Company organized a one-day ICAR-Industry-Stakeholder Consultation meet on 6 March 2023 to explore the Private Collaboration in taking the research forward to make the technologies industry ready for their faster adoption by the end-users. Accordingly, to promote and formalize the public-private partnership (PPP), the ICAR-Industry meet was conceptualized with the major objective of providing a platform for our key stakeholder, i.e. innovators of ICAR institutes to present their technologies to our clients/technology partners and understanding the feedback from market for providing the research a definite direction for positive outcome.



This event acted as seamless conduct between the industry and institutes in presenting their needs, discuss problems and inbuilt ideas amongst the innovators enabling them to identify and provide effective solutions. This was a platform for both our buyers (clients) and sellers (institutes) to interact, provide wide spectrum to the innovators to collaborate, develop and commercialize their technologies through AgIn.

The event was conducted in the form of Breakout sessions for all the sectors namely Crop Science, Horticulture, Animal Husbandary, Fisheries, Agriculture Engineering, Natural Resource

Management (NRM), Agriculture Extension, Agriculture Education and Bioformulation.

The event was graced by Shri Narendra Singh Tomar, Former Union Minister, Ministry of Agriculture and Farmers Welfare, Shri Kailash Chaudhary, Hon'ble Union Minister of State, Ministry of Agriculture and Farmers Welfare, Dr. Himanshu Pathak, Secretary and Director General (DARE/ICAR) along with Directors of various ICAR Institutes and Industry specialists from the private representing the agriculture and allied sectors.

The meet was huge success and was attended by more 120 Industry participants, all the ICAR Institutes, SAUs etc.

## **2. Introductory and Awareness Meeting on Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013**

An internal Complaints committee has been constituted under the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013.

An Introductory and Awareness programme on Sexual Harassment of Women at Workplace (Prevention, prohibition and redressal) Act, 2013 was organized for the IC Committee Members and the employees of Agrinnovate India Limited on 24 March 2023 and Ms. Heena Khurana Nagpal, POSH HK Associates was invited as an outside Expert to give a presentation on the dos and don'ts of the POSH Act, 2013.

The programme aimed on the following issues:

- A detailed understanding of the POSH Act.
- Awareness on the acts which may constitute sexual harassment
- Awareness on the acts which does not constitute sexual harassment
- Behavior of employees while in workplace and outside
- Rights available to women under this Act.
- Consequences for false complaints
- Awareness about the IC Committee etc.

3. Dr. Sudha Mysore participated as a panelist in 'IP Commercialization in an Interconnected World lessons and policy opportunities for India and Denmark at New Delhi.
4. Dr. Praveen Malik, CEO, Agrinnovate India Limited was invited to attend 43rd Business Meeting of APHCA, Singapore on 12 November 2022.
5. A meeting was held with M/s Bayer Crop Science Ltd. in the presence of CEO, AgIn and the ICAR officials for Technology Collaboration in rice crops on 29 November 2022.
6. Invited to attend the Foundation Day of National Institute of Plant Biotechnology with emphasis on 'Fostering Biotech Innovations to Accelerate Bioeconomy' at New Delhi on 15 November 2022.
7. Invited as a Guest of Honour in the Seminar on "Silage Industry: A Paradigm Shift in Dairy Sector on 21 January 2023, organized by ICAR in association with Punjab Agricultural University, Ludhiana.
8. CEO, AgIn was invited to attend the Inauguration Function of Organic Farming Implementation and Kisan Pathshala at Safidon, Distt. Jind Haryana on 9 February 2023.
9. Invited to attend the Kisan Farm Exhibition at Village Gawad, Hisar, Haryana on 10 February 2023.
10. CEO, Agrinnovate was invited as a Guest Speaker for Indian Seed Congress to discuss on 'Commercialization of Technologies for Seed development- AgIn's approach' on 4 March 2023.
11. Attended 5th Meeting of AAG under the joint Chairmanship of JS (Extn.) and JS (RKVY) on 21 March 2023.

## **Future Strategy**

Having established itself as a One stop shop for all agricultural technologies, market ready for commercial businesses, AgIn is looking towards diversifying its activities into enhancing revenue generation through AgIn enterprise scale up and equity-based partnership with startups.



03

**DARE  
INTERNATIONAL  
COOPERATION  
ACTIVITIES**



## CG-Section

The Department of Agricultural Research and Education (DARE) was established in the Ministry of Agriculture in December 1973. DARE is the nodal agency for International Cooperation in the areas of agricultural research and education in India. The Department liaises with foreign governments, UN, CGIAR and other multilateral agencies for cooperation in various areas of agricultural research and education.

As provided in the Government of India's Allocation of Business Rules, 1961, made under Article 77(3) of the Constitution of India, which inter-alia allocates following to the Department of Agricultural Research and Education (DARE).

*"International cooperation and assistance in the field of agricultural research and education including relations with the foreign and international agricultural research and education institutions and organisations."*

International Cooperation in DARE has been operating through the Memoranda of Understanding (MoU) and Work Plans signed with various Countries/ International Organisations/Foreign Universities and Institutes with DARE as the nodal Department.

The areas of cooperation as agreed in the MoU are implemented through development of Work Plans which describe specifically the activities to be carried out under the Cooperative Programme and which set forth the intended contributions of each party. These Work Plans shall originate from either party but will require the full approval of both the Parties for implementation.

Many activities are carried out under the approved Work Plans which also include exchange of Scientists/Experts of each country for study tour/training programme on mutual consent.

Consultative Group on International Agricultural Research (CGIAR) is a global organization that unites international organizations engaged in research for a food-secured future. CGIAR research is dedicated to reducing rural poverty, increasing food security, improving human health and nutrition, and ensuring sustainable management of natural resources. Out of its 15 Centres, ICAR/DARE has strong collaboration in the field of agricultural research, education and capacity building with IRRI, IFPRI, CIMMYT, ICARDA, ICARDA, ICRAF, IWMI, ILRI, ICRISAT, WFC, CP, Bioversity and CIAT alliance.

India is a donor member country of CGIAR from decades and also a voting member in CGIAR System Council, representing South Asia Constituency of the Council along with two alternate partner countries, viz. Bangladesh and Sri Lanka. India has assumed important role in CGIAR System as a permanent voting member.

Now, the CGIAR is going through a transition/change process and research will now be grouped in different Initiatives under the One CGIAR (effective from January 2022, after the termination of the CGIAR Research Programmes by 31 December 2021). The new Initiatives will work on identified areas, bringing together relevant CG Centers and the global demand, innovation and scaling partners.

CG Section processes all work relating to CG Centres including processing of MoU, Work Plans and foreign visits of scientists/officials of ICAR/DARE, payment of annual contribution to CGIAR and collaborative projects between ICAR and CGIAR Centres.

### Major Activities

- Annual Review Meeting with the Consultative Group on International Agricultural Research Centers (CGIAR) held virtually on 3-4 February 2021 to discuss their ongoing activities with India focus as well as their future plans.
- Secretary, DARE and DG, ICAR Chaired a virtual meeting on 12 March 2021 with representatives of IRRI, ICARDA, ICRISAT, CIP, ICRAF, CIMMYT and AVRDC to discuss on Rice-fallow cropping system optimization, diversification and intensification in Chhattisgarh, Jharkhand and Odisha.
- Work Plan signed on 31 May 2021 for the period 2021-25 between Indian Council of Agricultural Research (ICAR) and World Agro-forestry (ICRAF), Kenya was developed in accordance with the MoU signed between ICAR and ICRAF in 1985.
- A new project entitled Accelerating Genetic Gain in Rice (AGGRi) Alliance included in the existing ICAR- IRRI Work Plan.

### Collaborative Research Projects

- Revalidated the project entitled Management and mitigation of the spread of Tropical Race 4 of Fusarium wilt on banana - Mapping of the TR 4 affected area of Banana in India.

## DARE INTERNATIONAL COOPERATION ACTIVITIES

- Collaborative research project entitled Genetic Bio-fortification of Wheat for Grain Zinc was approved in collaboration with IFPRI.
- Revalidation the project entitled Genetics of Insecticide and Bt toxin resistance in *Helicoverpa armigera*.
- Collaborative research project entitled Sealing out Climate-Smart Agriculture for Resilient Farming in India was approved in collaboration with IWMI.
- Collaborative research project entitled Improvement of Banana for small holder farmers in Great Salt Lake Region of Africa [Indian Component-Breeding for Improved banana with Fusarium wilt (*Fusarium oxysporum* f. sp. *cubense*) resistance] Phase-II was approved in collaboration with Bioversity.
- Collaborative research project entitled Accelerating the Mainstreaming of Elevated Zinc in Global Wheat Breeding: A 'Fluoride in the Water' Approach to Nutrition (DFID DF) was approved in collaboration with CIMMYT.
- Collaborative project proposal entitled Accelerating Genetic Gains in Maize and Wheat for Improved Livelihood (AGG) was approved in collaboration with CIMMYT.
- Application of 11 Nepalese candidates have been received from Ministry of External Affairs for admission in various institutes/universities under India-Nepal Fund Scheme were processed in consultation with Agriculture Education Division, ICAR.
- Grant-in-aid to the tune of ₹ 31 lakh was released to National Academy of Agricultural Sciences, New Delhi.
- Grant-in-aid to the tune of ₹ 7 lakh was released to Indian Agricultural Universities Association, New Delhi.

### National Academy of Agricultural Sciences (NAAS)

The National Academy of Agricultural Sciences (NAAS), a national think-tank and platform for science-policy interface, leads in promoting excellence and convergence of agricultural research (science), education and extension for the growth of national economy with a vibrant farm sector. In pursuance of this mission, the Academy has been organizing agricultural science congresses, conferences, brainstorming sessions, consultations, round-table discussions and dialogues on important research and development related policy issues, for the benefit of the concerned stakeholders for promoting ecologically sustainable, economically vibrant and socially equitable agriculture. The Academy has played a significant role in providing vital and timely inputs on several critical policy issues for active consideration of the Government.

During the period, the Academy organised 13 brainstorming sessions, strategy workshops, experts' meet and expert consultations in virtual and/or hybrid mode, besides organising a number of lectures on contemporary issues on Indian agriculture. Publications were brought out based on the recommendations from these events with action points for policymakers, Central and State governments, institutions of higher learning, farmers and other stakeholders.

In pursuance of its mandate, the NAAS carried out following activities during the reporting year:

#### 1. Brainstorming Sessions/Strategy Workshops/Consultation Meetings

- A Brainstorming Session on Sea Weed Cultivation and Utilization on 16 November 2022

## IC-I Section (including NAAS and IAUA)

### Major Activities

- About 6 cases of foreign deputation including short term and long-term deputations were approved during 2023-24.
- About 17 cases of Cabinet note were processed during 2023-24.
- About 24 cases for grant of approval/NOC to various organizations for organizing International Conferences/Workshops, etc. in India were approved during 2023-24.
- Approval for 3 cases of International Consultancy project at various ICAR Institutes was granted during 2023-24.
- About 21 cases related to grant of permission to foreign nationals for undergoing research work under various Post-Doctoral and Doctoral Fellowships were processed and approved.
- Matters related to the fund release to the concerned SAU/ICAR Institute in respect of African students and Afghanistan Fellowship were also dealt with.

- A Brainstorming Session on Service Delivery Mechanism in Livestock Sector on 5 December 2022
- A Brainstorming Session on Plant-based vs Dairy Milk-myths and facts on 10 December 2022
- Agriculture in Harsh Environment: Challenges, Opportunities and Way forward on 24 February 2023
- Expert Meet on Atmanirbhar Bharat: National Clean Plant Programme on 3 April 2023
- Strategy Workshop on Food Safety Strategies for Indian Fisheries Sector on 17 May 2023
- A Brainstorming Session on Enhancing Agri-Infrastructure and Agri-Business Development through Public-Private Partnerships (PPPs) in India on 25 May 2023
- A Brainstorming Session on Bio-stimulant Guidelines on 21 August 2023
- Expert Consultation on Ethics and Current State of Research Publication on 31 August 2023
- A Brainstorming Session on Greening of Livestock and Poultry Sectors on 1 September 2023
- Expert Consultation on Preparing for COP 28 from an Agriculture Perspective on 25 September 2023
- A Brainstorming Session on Prospects of dsRNA based Biopesticides for Crop Protection in Indian Agriculture on 26 September 2023
- Strategy Workshop on Honey Bees: Harbinger of Sweet Revolution on 29 September 2023

## 2. Special Programmes/Other Activities

A Special Meeting of local office Bearers with Delhi School Children on the occasion of Children's Day. NAAS Office-bearers including Dr. T. Mohapatra, President; Dr. Anil K. Singh, Vice President; Dr. P. K. Joshi, Secretary, Dr. Malavika Dadlani, Editor, and Dr. Sanjeev Saxena, Executive Director visited Sarvodaya Kanya Vidyalaya, IARI Campus, New Delhi, on 14 November 2022, and interacted with more than 500 girl students along with the School Principal and teachers. The interaction focused on Nutrition Awareness and importance of balanced and nutritional food in our health and well-being.

## 3. Academia-Industry Meet

NAAS organized an Academia-Industry Meet on 23 December 2022, under the Chairmanship of Dr. T. Mohapatra, President, NAAS to discuss various topical issues with regard to policy development in agriculture and allied sectors. The participants represented various sectors from the industry and deliberated issues related to seed, agro-chemicals and crop protection, fertilizers, Indian poultry, and livestock sector including cattle feed and fodder seeds, with a view to ensure sustainable growth of agriculture and enhance profit of farmers.

## 4. NAAS-WFPO

The Academy collaborated with the World Food Prize Foundation and jointly organized a virtual workshop entitled 'Global Food and Nutritional Security, and Sustainable Development through Major and Minor Pulses' on 14 October 2022.

## 5. NAAS-PAAS

National Academy of Agricultural Sciences (NAAS) has organized an interaction meeting to have a dialogue with the Presidents/representatives of the Professional Association of Agricultural Societies (PAAS) in India on September 26, 2023. The objective of the meeting is to build close partnership between the NAAS and PAAS in various scientific and academic activities. Dr. Himanshu Pathak, President, NAAS and Secretary, DARE and DG, ICAR chaired the interaction. During the session, the President flagged that due to the prevailing current agricultural problems all Societies should identify a common theme every year and discuss and debate while working together and exchange of publications by sharing PDFs, reciprocal linkages with websites, conferences, publications with NAAS as Policy papers, books and other inputs.

## 6. Foundation Day Programme/Annual General Body Meeting

During the year 2023-24, the Foundation Day Programme/AGB Meeting was held during 4-5 June 2023 at New Delhi. Besides usual AGB business session, following science-based activities were organized:



**Presidential Address:** The Presidential Address was delivered by Dr. Himanshu Pathak, President, NAAS in 30th AGM on 5 June 2023. In his address, he 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.

**The Foundation Day Lecture:** On the occasion of its Foundation Day on 5 June 2023, the Foundation Day lecture was delivered by Shri B. V. R. Subrahmanyam, IAS, Chief Executive Officer of NITI Aayog and addressed by the Chief Guest Prof. Ramesh Chand, Hon'ble Member, NITI Aayog. Shri Subrahmanyam 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. He 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.

### 7. NAAS Regional Chapters' Activities

Twelve Regional Chapters of the Academy are actively functioning at Barapani, Bengaluru, Bhopal, Coimbatore, Cuttack, Hyderabad, Karnal, Kolkata, Lucknow, Ludhiana, Pune and Varanasi.

The regional chapters of the Academy organized several events to highlight the significant trends, concerns, and challenges within their respective regions. These events aimed to raise awareness about the Academy's diverse initiatives, such as mentoring young scientists through the chapters, promoting agriculture as a subject in educational institutions, particularly schools and colleges. They also placed a special emphasis on nutrition programmes for girls,

including school visits. Additionally, the chapters emphasized the significance of translating the important policy papers into regional languages to facilitate wider understanding and dissemination.

### 8. Publications

The crystallized views of the scientists emerging from the interactive sessions organized by the Academy published as Policy/Status/Strategy Papers and Policy Briefs, which provide useful inputs to the policy makers, planners, educationists and decision-makers. Following policy documents were published for the period:

#### a. Policy/Status/ Papers

- Policy Paper 110: Strategies and Approaches for Promotion of Sustainable Bivoltine Sericulture in India
- Policy Paper 111: Food Fortification: Issues and Way Forward
- Policy Paper 112: Gender and Nutrition based Extension in Agriculture
- Policy Paper 113: Contract Farming for Transforming Indian Agriculture
- Policy Paper 114: Promoting Millet Production, Value Addition and Consumption
- Policy Paper 115: Waste to Wealth - Use of Food Waste as Animal Feed and Beyond
- Policy Paper 116: Sustaining the Pulses Revolution in India: Technological and Policy Measures
- Policy Paper 117: Road Map for Rehabilitation of 26 Mha Degraded Lands in India
- Policy Paper 118: Entrepreneurship for Quality Fodder Production
- Policy Paper 119: Secondary Agriculture-Challenges, Opportunities and Way Forward
- Policy Paper 120: Scaling up Innovative Agricultural Extension Models
- Policy Paper 121: Self-sufficiency in Edible Oil Production

#### b. Strategy Papers

- Strategy Paper 17: Biofortification to Address Malnutrition in India: Present Status and Way Forward
- Strategy Paper 18: Drudgery Reduction in Agriculture through Improved Farm Machinery

### c. Policy Briefs

- Policy Brief 12: Limitations of Global Hunger Index and Way Forward
- Policy Brief 13: Regulation for Genetically Modified (GM) Foods and Detection of Unauthorized GM Food Events

### d. Periodicals and other publications brought out during the year are as given below:

- NAAS News (quarterly), a document covering the events and happenings in the Academy, besides views of Fellows and articles on contemporary issues; Vol. 22, No. 4 and Vol. 23, Nos. 1, 2, 3.
- NAAS Year Book and Year Planner (2023)
- Agricultural Research, the official Science Journal of the Academy Vol. 11, No. 4 and Vol. 12, Nos. 1, 2, 3.

## 9. Recognizing and Promoting Excellence of Individual Scientists in the Field of Agriculture

- Fellowship/Associateship:** The Fellowship of the Academy embodies a wide spectrum of national and international scientists. Fellows including Pravasi and Foreign Fellows are elected annually in recognition of their distinguished achievements in the field of agriculture and allied sciences. During 2023, 34 new Fellows including two Foreign Fellows and three Pravasi Fellows were elected and inducted into the Academy. The Academy also has a scheme of NAAS Associates for encouraging promising young scientists below the age of 40 years, to be associated with the Academy activities. During the year, 10 young scientists were selected as Associates of the Academy based on their academic excellence and scientific contributions as reflected by publications, and products, processes and technologies developed, etc.
- Academy Awards:** The National Academy of Agricultural Sciences has instituted the following Awards for recognizing significant contributions of senior, middle level and young scientists to promote agricultural research and recognize scientists for excellence in research in Agricultural and Allied Sciences including Environment and Nutrition. Memorial,

Endowment and Recognition awards are presented biennially at the time of Agricultural Sciences Congress. Young Scientist Awards are given annually and are presented in the Annual General Body meeting of the Academy.

- Memorial Awards (7)
- Recognition Awards (6)
- Young Scientists Awards (6)
- Endowment Awards (3)

During this year the six Young Scientists Awards for the year 2022 were presented on 5 June 2023.

### Indian Agricultural Universities Association (IAUA)

Indian Agricultural Universities Association (IAUA) was instituted on 10 November 1967. There were only nine founder-member agricultural universities, namely, Punjab Agricultural University, Chandigarh (now Ludhiana); Andhra Pradesh Agricultural University, Hyderabad (now Acharya N.G. Ranga Agricultural University, Guntur); Jawaharlal Nehru Krishi Vishwavidyalaya, Jabalpur; Uttar Pradesh Agricultural University, Pantnagar (now Govind Ballabh Pant University of Agriculture and Technology); University of Agricultural Sciences, Bengaluru; Kalyani University, Kalyani (now Bidhan Chandra Krishi Vishwavidyalaya, Mohanpur); Odisha University of Agriculture and Technology; Bhubaneswar; Udaipur University, Udaipur (now Maharana Pratap University of Agriculture & Technology) and Indian Agricultural Research Institute, New Delhi. Presently, IAUA has 73 member universities.

The main objective of the Association is to promote agricultural research, education and extension in the universities and the states, and thereby rural development in the country. It also acts as a bureau of information to facilitate communication, coordination and mutual consultation among agricultural universities. The Association also acts as a liaison between member universities and concerning government departments to facilitate communication and expedite the needed action in matters of importance. A quarterly newsletter is being published by the Association since 2000, covering important news, events and achievements of the member universities for the information of all members and others stakeholders. An annual report is also being published documenting major activities of IAUA and member universities of the year.

## DARE INTERNATIONAL COOPERATION ACTIVITIES

The IAUA organizes Annual Vice Chancellors' Convention, National Symposium, Brainstorming Session on the theme areas of importance related to agricultural education, research, extension, etc.

The proceedings and recommendations of these events are published through the host universities and uploaded on IAUA website ([www.iauaindia.org](http://www.iauaindia.org)) and also shared with all the Vice Chancellors of member universities and other stakeholders.

The IAUA has organized four events jointly with member universities, viz. 9<sup>th</sup> Regional Meeting, 46<sup>th</sup> Annual Vice Chancellors' Convention, 11<sup>th</sup> Brainstorming Session and 12<sup>th</sup> Brainstorming Session during October 2022 to September 2023, to discuss various emerging issues related to agricultural research, education and extension. A brief description of these events is given as under.

**Ninth Regional Meeting of IAUA:** The 9<sup>th</sup> Regional Meeting of Indian Agricultural Universities Association (IAUA) was organized on 'NEP-2020: Importance and Feasibility of Short Term and Certified Courses in Agricultural Universities' at Navsari Agricultural University (NAU), Navsari, Gujarat on 23-25 November 2022.

The inaugural ceremony of the 9<sup>th</sup> Regional Meeting was attended virtually by Shri Kailash Choudhary, the Hon'ble Minister of State for Agriculture and Farmers Welfare, Government of India as Chief Guest; Dr Z. P. Patel, Vice Chancellor, NAU, Navsari as President; Dr Kishor Singh Chanda, Vice Chancellor, Veer Narmad Singh, Gujarat University (VNSGU), Surat and Shri Kiranbhai Patel, Joint Managing Director, ASPEE Group of Companies as Guest of Honour; Dr Rameshwar Singh, Vice Chancellor, BASU, Patna and President, IAUA; and Dr Dinesh Kumar, Executive Secretary, IAUA as Special Guest.

The Vice Chancellors of Agricultural Universities including horticultural and animal sciences/veterinary universities of India participated in the meeting, shared their experiences and knowledge. The deliberations were mainly focused on the theme of the meeting. During following sessions, based on three sub-themes apart from inaugural and plenary sessions:

**Session 1:** Conceptualizations of certified courses in Agricultural Universities for technical and vocational skill development education

**Session 2:** Challenges and opportunities of NEP for development of short-term certified courses in Agricultural Universities

**Session 3:** NEP-2020- Developing future skills.

**Forty sixth Annual Convention of Vice Chancellors of IAUA:** The 46<sup>th</sup> Annual Convention of Vice Chancellors of member universities of Indian Agricultural Universities Association (IAUA) was organized by U.P. Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya evum Go-Anusandhan Sansthan (DUVASU), Mathura on the theme 'National Education Policy 2020: Implementation in Agricultural Universities' on 26-27 December 2022 at DUVASU, Mathura. The Vice Chancellors, Deans and Directors of about 45 Agricultural Universities from all over India participated in the convention. The chief guest of the inaugural session of this two-day programme was Smt. Anandiben Patel, Hon'ble Governor, Uttar Pradesh. Hon'ble Governor, presided over the programme in online mode, explained the importance of the new education system in the agricultural sector. In her address, she said that there is a dire need for agricultural universities in India to provide comprehensive solutions to the problems of farmers. The Guest of Honour of the programme, Dr R. C. Agrawal, DDG (Agricultural Education), Indian Council of Agricultural Research, New Delhi, said that National Education Policy-2020 (NEP-2020) provides an opportunity to higher educational institutions, especially those engaged in technical education, to create such a system, which directly contributes to the transformation of the country into a global knowledge superpower. Prof. A. K. Srivastava, Vice Chancellor of DUVASU while welcoming all the dignitaries in the programme emphasized on the need of consultation on this subject to strengthen the current agricultural education system of the country. He also said that the aim of this education system is to develop the best professionals having the ability to think and act logically with scientific temper and creative imagination.

During the two-day convention, three technical sessions were conducted where intensive discussions were held to implement the new education system in agriculture and related subjects. The topics of discussions during sessions were—NEP 2020 Implementation in AUs; Implementation of National Education Policy-2020 for Undergraduate Studies; Technology-enabled Interventions and Strategies for Implementation of New Education Policy; Agribusiness Opportunities in Agriculture; Short Term and Certificate Courses for Skill Development in Agriculture; Skill Development and Short Courses in Animal Husbandry Sector;



and Aligning Agricultural Education with National Education Policy for Atmanirbhar Bharat. The second day of the convention started with launch of International Millet Year-2023, wherein the importance and significance of millets and their availability and benefits were outlined by Dr V. Geethalakshmi, Vice Chancellor, Tamil Nadu Agricultural University, Coimbatore. The conference ended with valedictory cum plenary session on 2nd day where Shri Surya Pratap Shahi, Cabinet Minister, Agriculture, Agricultural Education and Agricultural Research, Government of Uttar Pradesh, graced the occasion as Chief Guest. Shri Shahi underlined the importance of millets and using the food made from coarse grains in our daily life. Along with this, he emphasized on the implementation of the new education policy in the agricultural higher education sector. Dr Rameshwar Singh, President, IAUA and Vice Chancellor, Bihar Animal Science University, Patna, presented report of the two-day and presented his views on the new education policy in the agricultural higher education sector. It was concluded that there is a need to adopt new education system to bridge the current gap between various stakeholders for attaining highest quality, equity and integrity in the higher education sector related to agriculture in the country.

**Eleventh Brainstorming Session:** In view of the natural resource degradation issues and further emerging challenges as well as the opportunities, the 11th Brainstorming Session of Indian Association of Agricultural Universities (IAUA), New Delhi was organized at the Rani Lakshmi Bai Central Agricultural University (RLBCAU), Jhansi during 7-8 April 2023 on 'Innovation in Sustainable National Resource Management'.

Besides, inaugural and plenary sessions following technical sessions were held during the event:

- Sustainable management of soil and water resources.
- Sustainable management of animal and fish resources.
- Sustainable management of plant resources including biodiversity.
- Sustainable climate resilient practices.
- Introducing innovations including AI, IoTs, block chain, agri-drone, blended learning, etc.

The Vice Chancellors from various State Agricultural, Horticultural and Veterinary Universities attended the Brainstorming Session. Besides, representative of Vice Chancellors, senior

officials from ICAR and Vice President NAAS also attended and actively participated in this Brainstorming Session.

Padma Bhushan Dr R. S. Paroda, former Secretary, DARE and DG, ICAR and Chairperson, TAAS, New Delhi was the Chief Guest in the Inaugural session. Dr Punjab Singh, former Secretary, DARE and DG, ICAR and Chancellor, RLBCAU, Jhansi chaired the Plenary session. Besides, Dr P. L. Gautam, former Chairperson, PPV&FRA, New Delhi and NBA, Chennai and former DDG (Crop Sciences), ICAR; Dr S. K. Chaudhary, DDG (NRM), ICAR, New Delhi; Dr J. K. Jena, DDG (Fisheries), ICAR, New Delhi; Dr P. Das, former DDG (Ag. Extension) and Dr A. K. Singh, Vice President, NAAS, New Delhi also addressed the delegates during different sessions. The experts shared their experiences and also put forward their views for the way forward with regard to sustainable management of the natural resources.

**Twelfth Brainstorming Session:** 12th Brainstorming Session of Indian Agricultural Universities Association (IAUA) was organized on 'Redefining Agricultural Education to Leadership, Entrepreneurship, Employment and Discovery (LEED)' at Sher-e-Kashmir University of Agricultural Sciences and Technology-Kashmir (SKUAST-K), Srinagar on 24-25 August 2023.

The Brainstorming Session brought together experts, to discuss innovative approaches to curriculum design, teaching methodologies, and student assessment that can produce skilled and employable graduates in agricultural sciences. The Brainstorming Session featured technical sessions, each focusing on a critical sub-theme related to agricultural education and research. The sessions were led by distinguished speakers who shared their expertise and insights. In each technical session, the key note lecture(s) followed by panel discussions involving Vice Chancellor and other experts. Attendees had the opportunity to learn about the future of agricultural education in alignment with the NEP-2020, bridging the skill divide in agriculture and related sectors, fostering entrepreneurship through incubation, innovation, and start-ups in agriculture universities, and maximizing the potential of Agri-4 technologies (AI, ML, IoT and Automation) for modernizing agriculture farms. This Brainstorming Session also provided an excellent opportunity for attendees to network, share ideas and best practices, and gain

## DARE INTERNATIONAL COOPERATION ACTIVITIES

valuable insights into the future of agricultural education.

One multi-party MoU was also signed by many Agricultural Universities for sharing of resources that will help student and faculty exchange. The following Technical Sessions were held, as follows:

**Technical Session I:** From Idea to Impact: Fostering Entrepreneurship through Incubation, Innovation and Start-ups in Agricultural Universities

**Technical Session-II:** The Future of Agriculture Education: Aligning with the National Education Policy 2020

**Technical Session-III:** Bridging the Gap: Closing the Divide in Agriculture and Related Sectors.

**Technical Session-IV:** Maximizing the Potential of Agri-4 Technologies (AI, ML, IoT & Automation) for Modernization of Agricultural Farms

In addition, a special IAUA General Session on 'Reforming Agricultural Ecosystem in India by Involving Stakeholders' was also convened during this event.

## IC-II SECTION (DARE)

### (A) Foreign Deputation cases

- (i) Processing of applications for various training programmes abroad under various foreign governments, announced by DBT/DST etc. GOI against open advertisements, UN/ International organizations, international agencies in various fields of agricultural research and education.
- (ii) Processing of applications for various fellowships/scholarships announced by ICAR, HRD, foreign governments, etc for higher studies/research/Ph D/Post Doctoral Research abroad.
- (iii) Processing of applications of the Scientists for foreign assignments in foreign governments and international organizations.
- (iv) Circulation of vacancies notified by CGIAR organizations, other international organizations/agencies such as ADB, World Bank, Commonwealth Secretariat, UN, etc.
- (v) Permission was granted to a total of 26 ICAR Scientists (Annexure-I) by this Department for various fellowships/trainings at foreign organizations/institutes.

- (vi) Permission was granted to 5 scientists (Annexure-II) for extension of fellowship/ training in international organizations.
- (vii) Permission was granted to 11 scientists (Annexure-III) for rescheduling of fellowship/ training in international organizations.
- (viii) NOC was granted to 04 ICAR scientists (Annexure-IV) to apply in different trainings/ fellowships in international organizations.
- (ix) A list of ICAR scientists (total 131 scientists) (Annexure-V) who were granted permission by this department for ADHOC Visit at foreign organizations/ institutes.

### (B) Germplasm Exchange

1. The cases of export of germplasm are processed in IC-II Section as per the provisions/ guidelines of the Biological Diversity Act, 2002 and the Biological Diversity Rules, 2004 also subject to guidelines/notifications issued by Ministry of Environment and Forests, from time to time.

The six Bureaus/Institutes under ICAR system have been designated by Ministry of Environment and Forests to act as repositories under the BD Act, 2002 for different categories of biological resources:

- (i) NBPGR- for exchange of plant germplasm
  - (ii) NBAGR- for exchange of animal germplasm
  - (iii) NBFGR- for exchange of fish germplasm
  - (iv) NBAIR- for exchange of germplasm of agriculturally important insects
  - (v) NBAIM- for exchange of germplasm of agriculturally important micro-organisms
  - (vi) IARI- for exchange of germplasm of algae and fungi
2. Cases of germplasm exchange are processed in DARE for approval of the competent authority in consultation with the Bureaus/Institutes/ Subject Matter Divisions.
  3. In the area of exchange of genetic resources, cases from concerned scientists of ICAR through authorized national bureaus on the basis of signed/agreed collaborative research projects involving ICAR, were processed in accordance with the provisions of Biodiversity Act and further guidelines notified in this regard.
  4. Approval of competent authority was conveyed to ICAR-NBPGR, New Delhi.
    - i. Export of seeds of 350×2 sets (700 samples) genotypes including pipeline varieties and

advance lines of wheat lines to Bangladesh and Mexico for screening against wheat blast and other diseases under collaborative research project No. 6 (wheat blast research, resistance phenotyping and training) of Work Plan 2022-27 through CIMMYT India.

- ii. Export of *Amaranthus* species (494 accessions) to Germany under DBT funded project “The genetic control of morphological and isonomic adaption during the colonization of India by grain amaranth” to University of Cologne, Botanical Institute, Biozentrum, Germany under Indo-German collaboration.
- iii. Export of Legume crop (cowpea 45 accessions) to project partner Namibia under STOL Project “Evolution of Stress Tolerant Orphan Legumes for use in Dryland Farming Systems across Sub-Saharan Africa and India”.

### (C) Annual Membership Contribution

- i. Annual Membership contribution to Centre for Sustainable Agricultural Mechanization, CSAM (Regional Institution of UNESCAP) Beijing, China amounting to US \$ 15,000 was released for the year 2020-21 on 16 March 2023.
- ii. Annual contribution to International Seed Testing Laboratory (ISTA), Switzerland on behalf of Seed Testing Laboratory, IARI, New Delhi amounting to 5214 CHF (Swiss Franc) was released on 8 February 2023 for the year.
- iii. Annual contribution to CABI, U.K. amounting to 56,000 GBP was released on 8 February 2023.

### IC-III Section

International Cooperation-III Section deals with processing of Memoranda of Understanding (MoU) signed by Department of Agricultural Research and Education (DARE) and Indian Council of Agricultural Research (ICAR) with foreign Governments, foreign Institutions and foreign Universities for collaboration in the field of Agricultural Research and Education through:

- Exchange of scientists and technologists
- Exchange of germplasm and breeding material
- Exchange of scientific literature, information and methodology
- Exchange of scientific equipment as available and required in programme of common interest as may be mutually agreed upon etc.

### Memoranda of Understanding (MoU)

The MoU are implemented through jointly developed Work Plans which describe specifically the activities to be carried out under the MoU.

### India Africa Forum Summit

Department of Agricultural Research and Education (DARE) has been designated as the Nodal Department for setting up of various projects under the India Africa Forum Summit. ICAR-Indian Institute of Soil Sciences (IISS), Bhopal is the nodal institute designated for setting up of a Soil, Water & Tissue Testing Laboratory (SWTTL) in Tunisia under the India Africa Forum Summit. The establishment of Soil Water Tissue Testing laboratory under Indian expertise will facilitate the conservation of soil resources and ensure balanced fertilizer applications to crops grown in Tunisia. The proposal is being finalized in consultation with Ministry of External Affairs, Government of India.

### Incoming Visits

In the Collaborative Research Project, the following visits have taken place:

- 1) Incoming visit of 5 Scientists from World Reference Laboratory for Foot and Mouth Disease (FMD), Pirbright Institute, United Kingdom to ICAR-Indian Veterinary Research Institute, Hebbal, Bengaluru during 6-8 February 2023.
- 2) Visit of Dr Sanjeev Kumar Srivastava, Associate Professor, University of Sunshine Coast, Australia to ICAR-CRIJAF, Barrackpore on 20 February 2023 and fieldwork from 21-25 February 2023 at Sundarbans, West Bengal under the approved APN Multinational project “Protecting Ecosystem and Livelihood of the Sundarbans, a World Heritage Site: Assessing the impact of natural hazards on forest and jute based ecosystem services.
- 3) Incoming visit of 10 students from Michigan State University (MSU) to ICAR-Central Marine Fisheries Research Institute, Kochi during 11-27 July 2023.

### Outgoing Visits

In the Collaborative Research Project, the following visits have taken place:



## DARE INTERNATIONAL COOPERATION ACTIVITIES

1. Visit of Dr T.H Singh, Principal Scientist, ICAR-Indian Institute of Horticultural Research, Bengaluru for “Study visit and consultation meeting to the Netherland related to DUS testing on Tomato (Greenhouse)” held at Netherlands from 10-14 October 2022 (excluding journey time).
2. Visit of Dr. Y. Suresh Reddy, Scientist, ICAR-Indian Institute of Vegetable Research, Varanasi for “Study visit and consultation meeting to the Netherland related to DUS testing on Tomato (Greenhouse)” held at Netherlands from 10-14 October 2022 (excluding journey time).
3. Visit of Dr Gauranga Kar, Director, ICAR-Central Research Institute for Jute and Allied Fibres (CRIJAF), Barrackpore to Kolkata, West Bengal for “Field visit and project workshop at United International University, Dhaka, from 17-18 February 2023 (excluding journey time) under a Multinational Project titled Protecting ecosystems and livelihoods of the Sundarbans, a World Heritage Site: Assessing the impact of natural hazards on forest and jute-based ecosystem services” funded by Asia Pacific Network for Global Change Research (APN-GCR), Japan (H.Q.) and University of the Sunshine Coast, Australia.
4. Visit of Dr Somnath Kadappa Holkar, Scientist (Plant Pathology), ICAR-National Research Centre for Grapes, Pune to attend “ADB study tour for Clean Plant Centres in United States of America” held at USA, from 11-16 June 2023 (excluding journey time).
5. Visit of Dr Joy Krushna Jena, DDG (Fisheries Science), ICAR HQ. to attend Adhoc Workshop titled “32nd Governing Council Meeting of Network of Aquaculture Centres in Asia Pacific (NACA)” during 7-9 August 2023(excluding journey time) held at Chiang Mai, Thailand.
6. Visit of Dr Vishaw Bandhu Patel, ADG (Fruits and Plantation Crops), Horticulture Science Division, ICAR to attend “Asian Development Bank (ADB) Study Visit for Clean Plant Centers in the United States of America of the University of California, Davis, and Washington State University, United States of America” from 11-17 June 2023(excluding journey time) held at United States of America.
7. Visit of Dr Dheeraj Singh, Principal Scientist, ICAR-CAZRI-KVK, Pali, Rajasthan to attend Adhoc Workshop co-organized by the Asian Development Bank Institute (ADBI) and the Queensland University of technology and Australian Centre for International Agricultural Research (ACIAR), entitled “Climate Adaptation and Inclusive Development in Agricultural Sector for South Asia” held in Kathmandu, Nepal from 12-16 June 2023 (excluding journey time).
8. Visit of Dr Dilip Kumar Ghosh, Director, ICAR-CCRI, Nagpur to attend ADB (Asian Development Bank) sponsored Study Tour for Clean Plant Centers in United States of America, entitled “Clean Plant Centres of University of California, Davis and Washington State University USA” held in USA from 11-17 June 2023 (excluding journey time).
9. Visit of Dr Susheel Kumar Sharma, Scientist, ICAR-IARI, New Delhi to attend Asian Development Bank (ADB) Study tour entitled “Clean Plant Centers in the United States of America” from 11-17 June 2023 (excluding journey time) held at United States of America.
10. Visit of Dr Gauranga Kar, Director, ICAR-Central Research Institute for Jute and Allied Fibres (CRIJAF), Barrackpore, Kolkata, West Bengal to attend a workshop from 10-14 July 2023 (excluding journey time) at University of the Sunshine Coast, Moreton Bay Campus, Queensland, Australia.
11. Visit of Dr Rakesh Bhardwaj, Principal Scientist, ICAR-National Bureau of Plant Genetics Resources, Pusa, New Delhi to attend Adhoc Symposium titled “15<sup>th</sup> International Symposium on Buckwheat”, held at Institute of Soil Science and Plant Cultivation- State Research Institute in Pulawy, Poland from 2-8 July 2023 (excluding journey time).
12. Visit of Dr. B. Dayakar Rao, Principal Scientist, ICAR-Indian Institute of Millets Research, Hyderabad to attend adhoc Workshop entitled “Food and Agricultural Organization of the United Nations Regional Launch Event: One Country One Product and Workshop on the Implementation of the OCOP Country Projects in the Region of Asia and the Pacific”, at Dhaka, Bangladesh from 18-20 July 2023 (excluding journey time).
13. Visit of Dr Pramoda Kumar Sahoo, Director, ICAR-Central Institute of Freshwater Aquaculture, Bhubaneswar to attend adhoc Workshop entitled “32nd Governing Council Meeting of Network of Aquaculture Centres in

- Asia-Pacific”, at Chiang Mai, Thailand” from 7-9 August 2023 (excluding journey time).
14. Visit of Dr Amaresh Kumar Nayak, Director, ICAR-National Rice Research Institute, Cuttack, Odisha to attend Workshop entitled “Climate change adaptation and mitigation in rice ecosystems - and field visit to the rice-growing district of northern Italy” and Review meeting of RESILIENCE project from 4-8 September 2023 (excluding journey time).
  15. Visit of Dr Raghavendra Bhatta, Director, ICAR-National Institute of Animal Nutrition and Physiology, Bengaluru to attend Collaborative Research Work entitled “A multi-centre Collaborative Research Proposal TRR373 on Sustainable Rurbanity – Resources Society, and Regulatory Systems” was prepared by the University of Gottingen, Germany funding by the German Research Foundation (DFG)”, at Germany from 7-16 September 2023 (excluding journey time).
  16. Visit of Dr Arvind Kumar Rai, Principal Scientist, ICAR-Central Soil Salinity Research Institute, Karnal to attend workshop entitled “Research visit for deliberations on Sustainable land management in Drylands under ICAR-CSSRI-JIRCAS collaborative project, Development of Sustainable Resource Management Systems in Water Vulnerable Regions of India”, at Japan from 10-16 September 2023 (excluding journey time).
  17. Visit of Dr Satyendra Kumar, Principal Scientist, ICAR-Central Soil Salinity Research Institute, Karnal to attend workshop entitled “Research visit for deliberations on Sustainable land management in Drylands under ICAR-CSSRI-JIRCAS collaborative project, Development of Sustainable Resource Management Systems in Water Vulnerable Regions of India”, at Japan from 10-16 September 2023 (excluding journey time).
  18. Visit of Dr Rajender Kumar Yadav, Director, ICAR-Central Soil Salinity Research Institute, Karnal to attend workshop entitled “Research visit for deliberations on Sustainable land management in Drylands under ICAR-CSSRI-JIRCAS collaborative project, Development of Sustainable Resource Management Systems in Water Vulnerable Regions of India”, at Japan from 10-16 September 2023 (excluding journey time).
  19. Visit of Dr T. H Singh, Principal Scientist, ICAR-Indian Institute of Horticultural Research, Bengaluru to attend “The study visit for understanding the principles and methodology of DUS Testing with regard to the species (Tomato) according to UPOV system Vis-a Vis Indian DUS Test by PPV&FRA in order to exchange experience related DUS Testing on Tomato in Greenhouse with expert from Naktuinbouw (The Netherlands Inspection Service in Horticulture Roelofarendsveen (Netherlands)”, at Netherlands from 25-29 September 2023 (excluding journey time).
  20. Visit of Dr Yerasu Suresh Reddy, Scientist, ICAR-Indian Institute of Vegetable Research, Varanasi to attend “Study visit for understanding the principles and methodology of DUS Testing with regard to the species (Tomato) according to UPOV system Vis-a Vis Indian DUS Test by PPV&FRA in order to exchange experience related to DUS Testing on Tomato in Greenhouse with expert from Naktuinbouw (The Netherlands Inspection Service in Horticulture Roelofarendsveen (Netherlands)”, at Netherlands from 25-29 September 2023 (excluding journey time).
  21. Dr Vinod Kumar Singh, Director, ICAR-Central Research Institute of Dryland Agriculture, Hyderabad to attend adhoc conference entitled, “The Agriculture-Livestock -Forestry Nexus in Asia : Contributions and Potentials for Improving Farmers’ Livelihood, Soil Health and Adapting to and Mitigating Climate Change”, at Bhutan from 2-3 November 2023 (excluding journey time).

### Project Work

- 1) Foreign collaborative Project titled, ‘The genetic control of morphological and economic adaptation during the colonization of India by grain amaranth’ to be funded by DST under Indo-German Collaboration with German Research Foundation.
- 2) Project proposal of Dr. Gyanendra Singh, Principal Scientist, ICAR-IVRI, Izatnagar for participating in a programme to be funded by Australia-India grant-Project Title- “Australia-India Collaboration to Promote Sustainable Livestock Production” under DFAT Australia-Grants Programme 2020-21 Expression of Interest-The University of Melbourne.

## DARE INTERNATIONAL COOPERATION ACTIVITIES

- 3) Contract research proposal from M/s MSD Animal health-Intervet India Pvt. Ltd. on “The current status Marek’s disease in chicken flocks of India”.
- 4) “Utilization of agro-industrial/seaweed wastes as animal feed for reducing GHG emission, improving nitrogen use efficiency and livestock productivity” funded by International Atomic Energy Agency (IAEA).
- 5) IAEA Project entitled, “Delineating genomic diversity, population structure and demographic dynamics in diverse native buffalo breeds of India” of ICAR-NBAGR, Karnal.
- 6) Project proposal “Improving efficiency of animal breeding programs using nuclear related genomic information-practical applications in developing countries,” IAEA, Austria.
- 7) Collaborative research project entitled, “Genome editing for improved location traits in Indian Buffalo,” which is to be submitted to the Bill and Melinda Gates Foundation.
- 8) Collaborative research project entitled “Study of genetic diversity and population structure of *Oryza coarctata* ecotypes of Collaborator, USA, which is to be submitted to King Abdulah University of Science & Technology (KAUST), Thuwal, Saudi Arabia.
- 9) Foreign funded Contract Research project entitled, “Comparative Assessment of alder as an alternative to Urea on productivity and profitability and Nutrient use efficiency of Maize-Wheat system under Indo-Gangetic Plains.
- 10) Collaborative research project entitled, “Risk estimation and predication and Risk Mapping and Communication of Anthrax using Artificial Intelligence systems” under “One Health Approach for Molecular Epidemiology and Risk Assessment for *Bacillus anthracis* in India (OHAI)” to be funded by Defense Threat Reduction Agency (DTRA), USA through Pennsylvania State University.
- 11) Collaborative Research Project for conducting training and demonstration for the farmers of microbial biopesticides for the management of fall armyworm in a project through a Letter of Agreement to be funded by FAO.
- 12) Collaborative Research Project for Medical Research Council funded project through UK Centre for Ecology and Hydrology (UKCEH) on “IndoZooRisk: Using One Health approaches to understand and co-develop interventions for zoonotic diseases affecting forest communities in India.
- 13) Extension of the Project, “Evaluation of Stress Tolerant Orphan Legume for Dry Land farming systems across sub-Saharan Africa and India”-Promoting India-Africa Framework for strategic cooperation.
- 14) A collaborative Research Project for the seed treatment-based field trials and Agro-ecological options for Fall Armyworm Management.
- 15) Proposal on “Meat and poultry industry by-products as a source of bioactive peptides for enhancing food safety: Sustainable and circular recovery model for Russia and India.”
- 16) Proposal on “Unravelling the Interplay of Physiological and Molecular Mechanisms in Heat Stress and its Impact on Oil Content for Sustainable Cultivation of Rapeseed and Mustard under Changing Climate.”
- 17) Proposal on “Approval of foreign funded project proposal on Abundance and Diversity of AMF in the North-Eastern Hills of India.
- 18) Proposal on “Capacity Building Training Programme for Master Trainers”.
- 19) Proposal on “Capacity Building Training Programme for Master Trainers” under Indo-German Bilateral Cooperation on Seed Sector Development (Northern, Eastern and Southern Zone).

## IC-IV SECTION

Consultative Group on International Agricultural Research (CGIAR) is a global partnership that unites international organizations engaged in research for a food-secured future. CGIAR research is dedicated to reducing rural poverty, increasing food security, improving human health and nutrition, and ensuring sustainable management of natural resources. Out of the 15 CG Research Centres, International Crops Research Institute for Semi-Arid Tropics (ICRISAT) has its Headquarters in India while some of the Research Centres with whom India is concerned have their Liaison/Branch Offices in India as listed below:

- International Crops Research Institute for Semi-Arid Tropics (ICRISAT), India
- International Maize and Wheat Improvement Centre (CIMMYT), Mexico;
- International Rice Research Institute (IRRI), Manila, Philippines;



- International Potato Centre (CIP), Lima, Peru;
- International Center for Agricultural Research in Dry Areas (ICARDA), Beirut, Lebanon;
- International Centre for Research in Agroforestry (ICRAF), Nairobi, Kenya;
- Bioversity International (BIO. INT), Rome, Italy;
- International Food Policy Research Institute (IFPRI), USA;
- International Livestock Research Institute (ILRI), Nairobi, Kenya; and
- International Water Management Institute (IWMI), Sri Lanka.

## Research Activities

The above Research Centres are engaged in various kinds of agricultural and other related research activities in accordance with their subject domain. Centre-wise activities and area of research, in brief, are given below:

### (1) International Crops Research Institute for Semi-Arid Tropics (ICRISAT)

ICRISAT is a world centre for the improvement of sorghum, millet, pigeon pea and chickpea and its main activities are:

- Research on practical and theoretical problems including plant breeding related to the production of sorghum, millets, chickpea and pigeon pea and on the cropping and farming systems in which these crops are major components.
- Collection, evaluation, maintenance, manipulation and distribution of basic germplasm and of improved plant materials for use in breeding, improvement, and production programmes of national and regional programmes.

### (2) International Maize and Wheat Improvement Centre (CIMMYT)

CIMMYT is an international Agricultural Research Centre which works to reduce poverty and hunger by sustainably increasing the productivity of maize and wheat-based farming systems. The ICAR-CIMMYT partnership in agricultural research is one of the world's longest and most productive, with about six decades of history. The main activities and achievements have been:

- In 2022, 10 CIMMYT wheat lines were identified for release, while 13 others carried

one of the CIMMYT lines as parent/grandparent. These varieties carry high yield potential, resistance to all major diseases, including wheat blast, and tolerance to heat and drought.

- Maize parental lines and hybrids having high yield and tolerance to biotic and abiotic stresses were developed and shared with the national system directly and through the International Maize Improvement Consortium. Asia's first State-of-the-Art Public Maize DH Facility was established at Kunigal, Karnataka, India.
- Socio-economic studies indicated that laser land leveling has been adopted by 80% of the farmers in Punjab and Western Uttar Pradesh study villages at least once in the last two decades due to significant water saving. Decreasing profitability, declining soil health, and falling water levels are the largest motivations to enroll in carbon farming projects.
- Established 180 participatory innovation platforms for potential yield realization in maize systems in northwest and eastern India.
- Transform Agrifood Systems South Asia (TAFSSA) initiative implemented to enhance the food production to consumption continuum to support equitable access to sustainable healthy diets, improve farmer livelihoods and resilience, and conserve land, air and groundwater resources.
- About 100 national scientists trained: 4 (Long-term training on wheat breeding and pathology; wheat blast); 35 (on digital tools in wheat improvement); 6 (DH line development); about 60 (Climate Resilient Agriculture, farming systems, mechanization, seed systems).
- Twenty seven research papers were published in peer-reviewed journals with national partners.

### (3) International Rice Research Institute (IRRI)

IRRI is a nonprofit autonomous international research and training organization for scientific and technical cooperation in research on Rice with a mission to reduce poverty and hunger and to improve the health of rice farmers and consumers. IRRI and India have been successfully collaborating for more than four decades. ICAR as the nodal body for IRRI's program in India endorsed GRiSP and mutually agreed to continue and strengthen collaboration under the following thematic areas of the GRiSP Program:

## DARE INTERNATIONAL COOPERATION ACTIVITIES

- Harnessing genetic diversity to chart new productivity, quality, and health horizons;
- Accelerating the development, delivery, and adoption of improved rice varieties;
- Ecological and sustainable management of rice based production systems;
- Extracting more value from rice harvests through improved quality, processing, market system and new products;
- Technology evaluation, targeting, and policy options for enhanced impact;
- Supporting the growth of the global rice sector.

### (4) International Potato Centre (CIP)

CIP is an international research and training organization for scientific and technical cooperation in the research on Potato, sweet potato and other tropical roots and tuber crops research. Main objectives of CIP are:

- Crop improvement Breeding and Selection for Biotic/Abiotic Stress Tolerance;
- Survey of vector and pathogen pressures in potato production at project sites in India;
- Enhancing Food Security and Improving Livelihoods of potato farmers by developing processing varieties;
- Enhancing Seed Systems: Improve farmer-based seed systems in Plateau and NE regions for enhanced productivity and profitability;
- Cropping Systems and Natural Resources Management: Studies on the introduction of potato in cereal based cropping systems in the Indo-Gangetic plains.

### (5) International Center for Agricultural Research in Dry Areas (ICARDA)

ICARDA is an international organization with its major objectives involving research on rainfed agriculture systems in general; and international focus on the improvement of barley, lentil and faba bean; research on wheat triticale and chickpea in cooperation with other international centres and its major objectives are:

- Exchange of genetic resources for utilization in crop improvement programs between Indian National Agricultural Research System (NARS) and ICARDA;
- Research on improving water and crop productivity Indira Gandhi Canal Command area of Rajasthan;

- Mapping of rice-fallows to identify areas using geo-informatics tools for various crop cultivation to increase cropping intensity;
- Evaluation of ICARDA germplasm of kabuli chickpea, lentil, grass pea, faba bean, forage and fodder species, wheat, barley and selection of site-specific species/genotypes.

### (6) World Agroforestry (ICRAF)

World Agroforestry, ICRAF is closely working with ICAR institutes of NRM, Crop Science and Horticultural Science Divisions in the domain of Agroforestry and allied aspects to complement the overall aims and goals of ICAR and to enhance the livelihoods of farmers. As part of the ICAR-ICRAF Work Plan 2021-2025 and based on the priority areas decided for 2022-23 during the last ICAR-CG Meeting, the salient achievements for 2022-23 are highlighted below.

- A pilot study was initiated on drone application in agroforestry at ICAR-NBPGR Issapur Farm.
- In the current year multispectral drone data collection was done from the farms at UHS, Bengaluru and ICAR-CAFRI, Jhansi. The analysis of the data and interpretation is ongoing.
- A prototype Hand-held Portable scanner (Neo-spectra scanner) to analyse soil samples has been developed.



Capacity building exercise during the drone data collection, explaining recent advances in drone application in agroforestry to students and faculties.



UAV data collection at ICAR-CAFRI Campus, Jhansi. a) UAV flight planning, b) map of ICAR-CAFRI Research farm, and c) Sample of UAV-RGB data of Neem Block at CAFRI.

- An “International Webinar on Soil Spectroscopy—An Emerging Technique for Rapid Soil Health Assessment” jointly organized by ICAR-Indian Institute of Soil Science (IISS), Bhopal and World Agroforestry (ICRAF) recommended, the Mid-infrared (MIR) technology for the estimation of the Soil Organic Carbon (SOC), pH, clay, silt and sand in Alfisols, Inceptisols and Vertisols of India for estimation of these soil parameter for assessment of soil health.

### **(7) Alliance of CIAT Bioversity International**

Bioversity international is an autonomous international scientific institute with a responsibility to advance the conservation and use of plant genetic resources for the benefit of present and future generations and their main objectives are:

- To undertake collaborative research to investigate and promote the use and conservation of agricultural biodiversity in order to achieve better nutrition, improve smallholders’ livelihoods and enhance agricultural sustainability.
- Reinforcing the resilience of poor rural communities in the face of food insecurity, poverty and climate change through on farm conservation of local agrobiodiversity.

### **(8) International Food Policy Research Institute (IFPRI)**

IFPRI is an international centre supported by CGIAR. Its mandate is to identify and analyze alternative national and international strategies and policies for meeting food needs in the world with particular emphasis on low-income countries and on the poorer groups in these countries.

ICAR and IFPRI have been working together on collaborative research since 1988. The focus of these programs has been broadly to achieve sustainable agricultural development, agricultural diversification and human resource development. Several useful policy options have emerged from the research.

IFPRI has successfully organized National Seminar on Regulations & Governance Issues in Indian Seed Sector during 26-27 September 2023 at ICAR Lecture Hall, Second Floor, NASC Campus, Pusa, New Delhi.

### **(9) International Livestock Research Institute (ILRI)**

International Livestock Research Institute (ILRI) is the only CGIAR centre dedicated entirely to animal agriculture research for the developing world. ILRI is co-hosted by two African nations, Kenya and Ethiopia with its headquarters in Nairobi, Kenya, and the principal campus in Addis Ababa, Ethiopia. It works through a network of regional and country offices and projects in East, South, and Southeast Asia, Central East, Southern, and West Africa. ILRI functions with a broad mission of improving food and nutritional security and reducing poverty in developing countries through research for efficient, safe, and sustainable use of livestock—ensuring better lives through livestock. The outcomes of these research partnerships help people in developing countries keep their farm animals alive and productive, increase their livestock and farm productivity in sustainable ways, find profitable markets for their animal products, and reduce the risk of livestock-related human diseases. ILRI has been working in South Asia since 2004, having its regional office in Delhi and coordinating research activities in South Asia. ILRI has two project offices in India, viz. Hyderabad and Guwahati.

In the region, ILRI has demonstrated the use of its knowledge and skills in conducting multi-disciplinary research on livestock-based livelihood, fodder innovation, zoonosis, and food safety, participatory epidemiology, disease economics, informal milk market improvement, value chain assessment, research and identification of policy intervention and advocacy to complement the strong technical research capacities among the NARS, especially in India. ILRI’s research goes much beyond livestock technologies and based on ILRI’s prevailing strengths and experience, ILRI complements NARS expertise by conducting research in the fields of food safety and zoonosis, gender, climate change, feed and fodder innovation, biotechnology, economic assessment of livestock systems, epidemiological studies, genetic studies and policy facilitation.

### **(10) International Water Management Institute (IWMI)**

Activities carried out by IWMI, ICAR and other partners during the stated period are presented here.



## DARE INTERNATIONAL COOPERATION ACTIVITIES

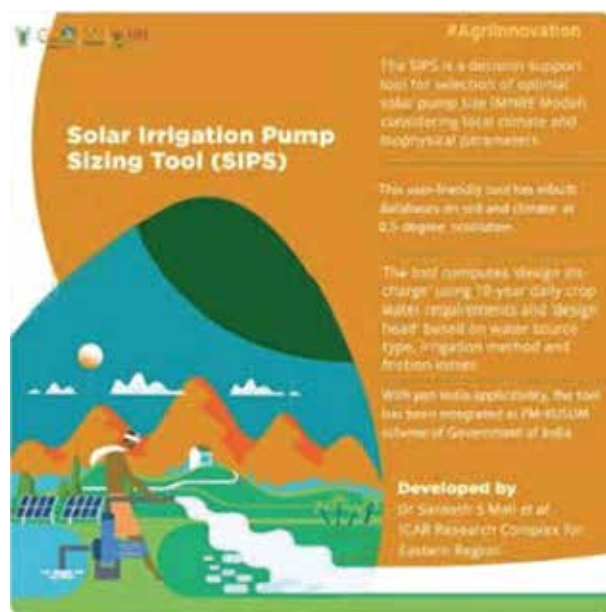


- Workplan 2022-2026 was signed by Dr. Himanshu Pathak, Secretary (DARE) & Director General (ICAR), and Dr. Mark Smith, Director General of IWMI in the presence of Dr. S. K. Chaudhari, DDG (NRM), Dr. Alok Sikka, Country Representative of IWMI India between ICAR and IWMI on 21 April 2022 at IWMI Headquarters in Colombo, Sri Lanka. IWMI Collaboration with ICAR Research achievements and outreach activities of International Water Management Institute (IWMI) are centred around three strategic programmes — Water, Food and Ecosystems; Water, Climate Change and Resilience; and Water, Growth and Inclusion — each supported by high-quality science and digital innovations.
- Under “Building Climate Resilience of Indian Smallholders through Sustainable Intensification and Agro-ecological Farming Systems to Strengthen Food and Nutrition Security (RESILIENCE)”, IWMI introduced innovative technologies and convergence measures to increase on-farm water use efficiency and upscale adoption of interventions. The policy recommendations from the project were presented at the “High Level Policy Roundtable on Transforming Odisha’s Agri-Food Systems” on 20 October 2022 under the session organized by IWMI and IFPRI in collaboration with the Department of Agriculture and Farmers’ Empowerment, Odisha on “Water and Energy



Policies for transforming Agri-Food Systems”.

- System modernization is a significant development approach for performance improvement in canal irrigation systems. IWMI’s study on analytical framework for the performance assessment of Kukadi Left Bank Canal (LBC) irrigation systems in Maharashtra attempted to identify alternative system modernization approaches to ensure resilient livelihood for people and increase the irrigation systems’ economic water productivity (EWP), i.e. the value of outputs per unit of water use.
- IWMI has been working with ICAR on the Water Productivity (WP) Atlas for the Indian districts and sub-river basins. The atlas includes physical and economic water productivity (PWP and EWP), nutritional water productivities (calories, proteins, and fat), and water footprints for major crops, and cropping systems. This Atlas can show the trends of WP’s from 1999 to 2021 for 596 districts, states, sub-river basins and 19 river basins across different time periods and districts.
- IWMI in partnership with Alluvium is carrying out a pilot study funded by the Australian Water Partnership (AWP) in the lateritic belt of West Bengal to improve water management through monitoring and evaluating the irrigation project investments looking at their water use patterns, water productivity and socio-economic aspects.
- IWMI-ICAR-BISA Solar Irrigation Pump Sizing Tool has been featured as one of ICAR’s achievements in 2022-23 in soil and water productivity. MNRE has adopted the SIP



sizing tool for PM-KUSUM, available on the ministry's website. The CGIAR Initiative on NEXUS Gains has identified the tool as an innovation for scaling. A similar tool is being developed for Nepal in partnership with ICAR and GIZ. This activity is undertaken as part of the IWMI project on Solar Energy for Rural Livelihood (SERL) and CGIAR Initiative on NEXUS Gains.

- (11) IC-IV Section processes all work relating to CG Centres including processing of MoU, Work Plan and foreign visits of scientists/officials of ICAR/DARE, payment of annual contribution to CGIAR, collaborative projects between ICAR and CGIAR Centres and matter related to ASEAN, BIMSTEC, SAARC.

### Major Activities

- The Seventh ASEAN-India Ministerial Meeting on Agriculture and Forestry was held on 25-26 October 2022. Former Agriculture Minister Shri Narendra Tomar Chaired the meeting from India.
- The Second BIMSTEC Agriculture Ministers Meeting was held on 10 November 2022. Former Agriculture Minister Shri Narendra Tomar Chaired the meeting from India.
- Four Work Plans of CIP, ILRI, ICARDA and IWMI has been signed with ICAR for the period of Five years.
- Annual Review Meeting with the Consultative Group on International Agricultural Research Centers (CGIARCs) held on 27 February 2023 to discuss their ongoing activities with India focus as well as their future plans.
- Approval for organizing the International Conference on "Innovations to Transform Drylands" during 21-23 February 2023, at ICRISAT HQ, Hyderabad, Telangana.
- Permission for organizing the "International Workshop on Phenotyping for drought tolerance" from 7-11 March 2023 in collaboration with Alliance of Bioversity International – CIAT.
- Approval for organizing the International Conference on CGIAR GENDER Impact Platform Biennial Conference "From Research to Impact: Towards just and resilient agri-food systems", during 9-12 October 2023 at NASC Complex, New Delhi.
- The Preparatory Senior Officials Meeting of the Seventh ASEAN-India Ministerial Meeting in

Agriculture and Forestry (The PrepSOM-7th AIMMAF) held on 25 October 2022 in India through Video Conference.

- Second Meeting of the BIMSTEC Senior Officials on Agriculture held on 09 November 2022 at New Delhi, India in virtual mode.

### Projects

Following collaborative research projects have been processed for approval in collaboration with the ICAR's Institutes:

- Collaborative Research Project proposal entitled, "The South Asia Agriculture Adaptation Atlas: Interconnections between Climate Risks, Practices, Technologies, and Policies" for the period of three years.
- Collaborative Research Project entitled, "Physiological basis of amelioration of heat stress through nitrogen management in wheat" submitted by ICAR-IARI, New Delhi in collaboration with International Maize and Wheat Improvement Center (CIMMYT), Mexico for a period of three years.
- Collaborative research project entitled, "Development and validation of Integrated Pest Management (IPM) modules to tackle Fall Armyworm *Spodoptera frugiperda* infestation in maize" to be funded by International Maize and Wheat Improvement Centre (CIMMYT), Nairobi, Kenya, submitted by ICAR-Indian Institute of Maize Research (ICAR-IIMR), Ludhiana.

### Foreign visits

Foreign visits of ICAR's Scientists: One hundred twenty two proposals on FVMS portal have been received and processed in respect of Scientists of ICAR for participation in the different events organized by CG Centers. Besides, the following foreign visits have also been approved in respect of Dr. Himanshu Pathak, Secretary, DARE and DG, ICAR.

- Bangladesh: To attend 38 SAARC Charter Day on 8 December 2022.
- Sri Lanka: To attend ICAR-IWMI Steering Committee Meeting during 21-23 April 2023.
- USA: To attend CGIAR System Council Meeting during 10-12 May 2023.
- Indonesia: To visit ICRAF-CIFOR Hqrs. during 10-12 July 2023
- Philippines: To attend 6<sup>th</sup> International Rice Congress during 16-19 October 2023.



# 04

## PROGRESSIVE USE OF HINDI



## PROGRESSIVE USE OF HINDI

During the year, DARE has ensured compliance of the provisions of the Official Language Act, 1963, Official Language Rules, Resolution, General Orders, Notification, Administrative or other Reports, or Press Communiques, issued or made by the Central Government or by a Ministry, Department or office thereof or company, company owned or controlled by the Central Government or by any office of such corporation and various orders/instructions issued by Department of Official Language from time to time on progressive use of Hindi for official purposes in the Department and autonomous bodies coming under its purview. Efforts are being made for progressive use of Hindi in DARE as well as at its attached offices.

Targets and achievements, in brief, accomplished by Hindi Section of DARE with regard to progress of Rajbhasha and implementation of Official Language Policy are detailed below:

**Policy Implementation:** The Official Language Division of the Department, manned by an officer of the level of Assistant Director (OL) and one supportive staff (Senior Translation Officer) have made continuous efforts towards implementation of the instructions issued by the Department of Official Language in this Department and Autonomous Bodies under its purview. In this regard, effective check points have been prepared for compliance of the implementation of the Official Language Policy and circulated to all officers to ensure more and more use of Hindi while disposing off their official work. Emphasis has also been given to achieve the targets of correspondence in Hindi with offices located in “A”, “B” and “C” Regions.

**Notification of Institutions/Offices under Rule 10(4) of the Official Rules 1976:** Institutes/Offices of ICAR where 80% of staff have acquired working knowledge/proficiency in Hindi are notified under Rule 10(4) of the Official Language Rules, 1976. Overall, 149 offices and attached stations with regional offices of ICAR have been notified till date.

**Meetings of OLIC:** Quarterly meetings of joint Official Language Implementation Committee (OLIC) of DARE and ICAR have been conducted under the chairmanship of Additional Secretary

(DARE) and Secretary (ICAR), who is the nodal officer for implementation of the Official Language Policy in DARE. Four meetings have been organized up to 30 September 2023 and follow up action has been taken in compliance with the decisions taken in these meetings.

**Reports related to Official Language Policy:** Annual Assessment Report and Quarterly Progress Reports regarding use of Rajbhasha in the Department have been sent to the Department of Official Language, MHA.

**Inspections w.r.t. Official Language Policy:** During the year, up to four sections of DARE have been inspected to review the Progressive use of Hindi and suggestions have been given to solve practical problems being faced by the employees of these sections while working in Hindi. Inspection of CAU, Imphal and RLBCAU, Jhansi regarding progressive use of Hindi was also conducted in months of April 2023 and June 2023 respectively.

**Translation Work:** Translation of documents falling under section 3(3) of Official Language Act, 1963 has been done by Official Language wing of this Department. Documents like Cabinet Notes, Resolutions, Notifications, MoU/Agreements/ Work Plans in the field of Agriculture with other Institutes have been translated in Hindi within the stipulated time-frame based of their priority.

**Hindi Fortnight (Pakhwada):** Hindi Pakhwada has been observed from 14<sup>th</sup> September, 2023 to 29<sup>th</sup> September, 2023 in the Department in association with ICAR. On the occasion of “Hindi Diwas”, the message of Additional Secretary (DARE) and Secretary (ICAR) regarding progressive use of Hindi was circulated. In addition, various Hindi competitions were also organized during Hindi Fortnight. Total of 38 prizes have been awarded to the officials who performed well in Hindi competitions.

Five officials of this Department have participated in “Hindi Diwas and Third Akhil Bharthiya Rajbhasha Sammelan” organised by the Department of Official Language, Ministry of Home Affairs during 14 to 15 September 2023 at Pune.



# 05

## DEPARTMENTAL ACCOUNTING ORGANISATION

## ACCOUNTING ORGANIZATION OF DEPARTMENT OF AGRICULTURAL RESEARCH AND EDUCATION

The Secretary is the Chief Accounting Authority in the Department of Agricultural, Research and Education (DARE). Secretary discharges his functions with the assistance of Additional Secretary and Financial Adviser (A S & FA) and Chief Controller of Accounts.

1. As per Rule 1.2.2 of Civil Accounts Manual, the Chief Controller of Accounts for on behalf of the Chief Accounting Authority is responsible for:
  - a) Arrange all payments through the Pay and Accounts Offices/Principal Accounts Office except where the Drawing and Disbursing Officer are authorized to make certain types of payments.
  - b) Compilation and consolidation of accounts of the Ministry/Department and their submission in the form prescribed, to the controller General of Accounts; preparation of Annual Appropriation Accounts for the Demands for Grants of his Ministry/Department, getting them audited and submitting them to the CGA, duly signed by the Chief Accounting Authority.
  - c) Arranging internal inspection of payment and accounts records maintained by the various subordinate formation and Pay and Accounts Officers of the Department and inspection of records pertaining to transaction of Government Ministries/Department, maintained in Public Sector Banks.
2. The Chief Controller of Accounts, Department of Agriculture, Research and Education performs his duties with the assistance of 2 Controller of Accounts, 1 Assistant controller of Accounts and 8 Principal Accounts Officers (Admn/Estt; Accounts, Treasury Payments, IAW and IAP) at HQs with the help of 11 (Eleven) Pay and Account Officers of Department of Agriculture, Research and Education. Zonal Internal Audit Parties headed by Senior Accounts Officers is also stationed at Kochi who works under the control of IAW (HQ). The Organogram of Accounting Organization set-up in Department of Agriculture, Research and Education regarding distribution of work in the officer of Chief of Accounts are given at Exhibit 'A'. The Department of Agriculture, Research & Education has 02NCDDOs attached with the

PAO(Sectt-I). The Accounting information flow chart is given at Exhibit 'B'.

### 3. Roles and Responsibilities of CCAs as Head of Accounting Organization in Ministry /Department

In terms of O/o CGA OM no. TA-2-01001/2/ 2020-TA-II(Comp 21)/596 dated 23 July 2021, the Pr. CCAs/CCAs/Cas(IC) of the Ministries/ Departments concerned are heads of the Accounting Organization in the respective Ministries/ Department. Their broad functions are prescribed as below-

#### a. Receipts, Payments and Accounts:

- i. Oversee that effective and efficient systems with necessary internal controls are in place for accounting of all receipts and payments or respective Ministry/Department of the Central Government.
- ii. Supervise payment and receipts through Pay and Accounts Officers and Cheque Drawing and Disbursing officers (CDDOs) of various central civil ministry/departments in conformity with prescribed Rules and regulations.
- iii. Supervise timely payment to claimants (Government servants, Vendors grantee and loanee institution etc. including payment to suppliers w.r.t procurement through GeM) as per codal provisions.
- iv. Ensure efficiency, accuracy and timely submission of monthly and annual accounts to o/o of CGA.
- v. Ensure efficiency, accuracy, comprehensive, relevant and useful financial reporting.
- vi. Ensure timely, accurate and timely submission of monthly reports to o/o CGA.
- vii. Monitor efficient service delivery to the Ministry/Department by the accredited/ authorized banks and monitor their system for timely realization of receipts into Government Accounts.
- viii. Monitor adherence to prescribed accounting standards, rules and principles.
- ix. Ensure timely submission of Audited Annual Appropriation Accounts duly signed by



## DEPARTMENTAL ACCOUNTING ORGANISATION

Chief Accounting Authority of the Ministry/ Department to o/o CGA.

- x. Ensure preparation of annual 'Accounts at a Glance' in r/o their Ministry/Department.
- xi. Examine the proposal of Ministries/ Departments for opening of a Personal Deposit Account or framing accounting procedure in respect of a newly created Fund in the Public Account of India for making it operational.
- xii. Review of payment sanction (including GST refunds sanction) by Pr. CA/CCA/CA as per the monetary limit prescribed by O/o CGA from time to time.
- xiii. Monitor the clearance of balance under Debt, Deposit, Suspense and Remittance (DDSR) heads and take timely corrective actions to adverse balance under the heads.
- xiv. Monitor opening of appropriate heads of accounts for new schemes as per Budget circular and LMMHA.
- xv. Monitor timely and accurate authorization of pension and other retirement benefits to retiring Government servants.
- xvi. Coordinate with Gem Standing Committee on the matters relating to procurement and related payments.

In respect of the above responsibilities, the Pr. CCAs/CCAs/CAS(IC) shall function under the direction, superintendence and control of the Controller General of Accounts.

### **b. Budget formulating including Outcome Budget:**

- i. Pr. CCA/CCA/CA (IC) shall monitor and assist Preparation of budgetary proposals and assist the administrative Ministry/Department in better inter-se programme prioritization/ allocation within the budgetary ceilings, based on the analysis of expenditure and of each programme/sub-programme.
- ii. Provide necessary support to the administrative Ministries/Departments in preparation of Outcome Budget/Output-Outcome Monitoring Framework (OOMF) in accordance with the time schedule/guidelines laid down from time to time by Ministry of Finance.
- iii. Furnish the budget estimates in respect of Public Account transaction to Budget Division and Composite Demands controlled by Budget Division for their inclusion in the Budget.
- iv. Furnish budget estimated for interest on

Provident Fund balance of employees and on various deposits in the public accounts including Reserve Funds.

- v. Monitor all reports and statements related to Budget documents.

### **c. Estimation of Non-Tax Revenue Receipts:**

- i. Assist FA in periodical review of various non-tax revenue receipts of the Ministries/ Department with the Administrative Division and furnish estimates of non-tax Revenue Receipts to Budget Division, DEA.
- ii. CCA, Finance shall be responsible to furnish non-tax revenue receipts estimates relating to Group Insurance Scheme for Central Government employees to the Budget Division for its inclusion in the Budget [Specific to CCA (Fin)].

### **d. Internal Audit/Risk Based Audit:**

- i. Discharge the duties of Member Secretary of Internal Audit Committee headed by the Administrative Secretary to review audit paras of PAC, C&AG and Internal Audit and concomitant compliance/course correction.
- ii. They are responsible to conduct special audit in Ministries/Department as per the direction of Chief Accounting Authority or CGA. The Internal audit Wing working under the control and supervision of the Pr. CCAs/CCAs/Cas would move beyond the existing system of compliance/regulatory audit and would focus on:
  - a. Assessment of adequacy and effectiveness of internal controls in general, and soundness of financial system and reliability of financial and accounting reports in particular.
  - b. Identification and monitoring of risk factors (including those contained in the Outcome Budget/OOMF Framework);
  - c. Critical assessment of economy, efficiency and effectiveness of service delivery mechanism to ensure value for money; and
  - d. Providing an effective monitoring system to facilitate mid-course corrections.
- iii. Furnishes financial appraisal of schemes and monitor projects and schemes through regular Internal Audit.
- iv. Conduct audit of accredited banks, authorized/ other bank/CPPCs and Focal Point Bank branches including e-FPBS in respect of

Government transactions in organization where it has been required.

- v. Conducts Internal Audit of collections of the National Small Savings Scheme (Specific to M/o Finance).
- vi. Shall ensure to prepare the annual Audit Plan and Annual Internal Audit Review.

The above functions shall be carried out as per the guidelines issued by the CGA from time to time.

#### **e. Public Financial Management System and IT projects:**

- i. Monitor the usage of PFMS and its Different modules including coordinating with Ministry and PFMS Division of O/o CGA for timely, accurate and useful financial reporting for the purpose of tracking flow of funds to the last level implementing agency/beneficiary and its utilization under Central Sector/Centrally Sponsored/Direct Benefit Transfer schemes of Government of India.
- ii. Coordinate integration of data bases and processes for establishing a Government Integrated Financial Management Information System (GIFMIS).
- iii. Render professional expertise in the functioning of the financial management system, form the system point of view and making it more effective.
- iv. Monitor the implementation of security guidelines issued for access control and other related security aspect of PFMS and ensuring data security by regular monitoring of the system.
- v. Ensure correct mapping of the accounting basket of Central Sector and Centrally sponsored Schemes for accurate expenditure reporting.
- vi. Regular review of reports as and information in PFMS and to present it to the Executive for decision making.
- vii. Monitor all reports and dashboard on regular basis to ensure accuracy of reports relating to performance of the scheme in their respective Ministries.
- viii. Ensure timely weeding out of dormant registration of Agencies and etc.

#### **f. Expenditure and Cash Management:**

Coordinate with Ministries/Departments for compliance of Cash Management system guidelines issued Budget Division, MoF [Monthly Expenditure

Plan (MEP)/Quarterly Expenditure Plan (QEP)] limits, implementation of TSA system for release of funds to Autonomous bodies in 'Just-in-time'.

#### **g. Disclosure and reporting requirements under FRBM Act.**

Assist in preparation of the disclosure statement required under the FRBM Act in respect of their Ministry/Department for incorporation in the consolidated statement complied by the Ministry of Finance for the Government as a whole.

#### **h. Monitoring of Assets and Liabilities:**

Assist Ministries/Departments for maintaining comprehensive record of Assets and Liabilities and monitoring of Government Guarantees.

#### **i. Interaction between Ministry of Finance and the FAs:**

Pr. CCAs/CCAs/Cas(IS) shall provide required material and assistance for the quarterly meeting of FAs with Secretary (Expenditure) and other Financial inputs as required by FAs from time to time.

#### **j. General Administration and Coordination:**

- i. Exercise the power of the Head of the Department for the Accounting Organization and is responsible for the Administration and Establishment related function.
- ii. Discharge of responsibilities in terms of the statutory powers to be exercised being the Appointing Authority/Disciplinary/Authority

#### **Note:**

- a. In Ministries/ Departments which are headed by Pr. CCAs, these items of work may be delegated to CCAs/CCAs/CAS as per their administrative convenience, subject to codal provision.
- b. In addition to the above, Pr. CCAs/CCAs/CAS shall also be responsible for any other works assigned by Chief Accounting Authority/ Controller General of Accounts.
- c. In addition, Budget section of the ministry should ordinarily function under the control of CCA and CCAs are expected to act as Nodal officer for PFMS inter alia in resolving issues relating to its smooth function and efficient running in terms of Para 43 and Para 44 of Charter for Financial Adviser issued vide FS

## DEPARTMENTAL ACCOUNTING ORGANISATION

& Secretary (Expenditure) D.O. Letter No. 23(3)/E/Coord/2018 dated 13/06/2023.

### 4. Banking Arrangements

State Bank of India is the accredited bank for PAOs and its field offices in the Department of Agriculture, Research and Education. e-payments processed by the PAOs/CDDOs are settled through CMP, SBI, Hyderabad in Favour of the bank account of vendors/beneficiaries. In some cases, Cheques issued by the PAOs/CDDOs are presented to the nominated branch of the accredited bank for payment. The receipts are also remitted to the accredited banks by the respective PAOs/CDDOs apart from Non-Tax-Receipt Portal (NTRP). Any change in accredited bank requires specific approval of Controller General of Accounts, Department of Expenditure, Ministry of Finance.

Principal Accounts Office has 11 (eleven) Pay and Accounts Offices. 05 PAOs are located in Delhi/NCR, One each in Chennai, Cochin, Kolkata, Nagpur and two in Mumbai. All payments pertaining to the Department/Ministry are made through PAOs/CDDOs attached with respective PAOs. Drawing and Disbursing Officers present their claims/bills to the designated PAOs/CDDOs, who issue releases e- payment after exercising the necessary scrutiny as per provisions contained in Civil Accounts Manual, Receipt and Payment Rules and other orders issued by Government from time to time.

### 5. Internal Audit Wing

Internal Auditing is an independent, objective assurance and consulting activity designed to add value and improve an organization's operations. It basically aims at helping the organization to accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control and governance processes. It is also an effective tool for providing objective assurance and advice that adds values, influence change that enhances governance, assist risk management and control processes and improves accountability for results. Internal Audit Committee has been constituted in the DARE under the Chairmanship of Secretary (DARE). There are 02 Auditee Units/DDOs in the DARE including Autonomous Bodies and other Grantee Institutions.

## 6. Public Financial Management System (PFMS)

Public Financial Management System (PFMS) initially started as a Plan Scheme named CPSMS of the erstwhile Planning Commission in 2008-09.

**I. Employees Information System (EIS) Module:** This Module has been implemented in all Drawing and Disbursing Offices of Department of Agriculture, Research and Education.

**II. EAT Modules of PFMS:** All Autonomous Bodies of Department of Agriculture, Research and Education has been on-boarded on TSA Module of PFMS.

**III. Online Portal (Bharatkosh) for collection of Non-Tax Revenue:** NTRP portal Department of Agriculture, Research and Education is functional from April 2017 FAQ on NTRP is available at website link <http://cga.nic.in/Page/FAQ.aspx>

## 7. New Initiatives by Ministry of Finance and O/o Controller General of Accounts

### A. 'e-Bill system'

- a) The Union Minister for Finance & Corporate Affairs Smt. Nirmala Sitharaman launched the e-Bill system for Central Government Ministries on the 46<sup>th</sup> Civil Accounts Day. New e-Bill system to enable paperless submission and end to end digital processing of bills.
- b) In a phased manner, the new system will make the entire process of submission and backend processing of bills completely paperless and transparent. Thus, it is a major step forward in realizing the vision of "Digital India" and promoting ease of doing business.

### c) The objectives of the system are to:

- i) Provide convenience to all vendors/suppliers of the government to submit their bills/claims at any time, from anywhere.
- ii) Eliminate physical interface between suppliers and government officers.
- iii) Enhance efficiency in processing of bills/claims.
- iv) Reduce discretion in processing of bills through "First-In-First-Out" (FIFO) method.



- d) Currently, the suppliers of various goods and services to the Government have to submit physical, ink signed copies of their bills to the respective Ministries/Departments/offices of the Government of India. Similarly, the government employees also need to submit hard copies of their claims. At the backend too, the processing of bills is done through a mixed system of physical and digital modes. So, the suppliers/vendors or their representatives need to visit the offices to deliver bills. Moreover, they are able to track the status of processing of their bills.
- e) Under the newly launched e-Bill system, vendors suppliers can upload their bills online along with supporting documents from the convenience of their homes/offices at any time through digital signature. For those not having a digital signature, the facility of e-sign using Aadhaar has also been provided. So, the suppliers will no longer be required to visit the offices concerned for this purpose.
- f) At the backend too, the electronic bill received will be processed by the authorities digitally at every stage and finally, the payments will be credited digitally to the bank account of the vendor. The vendor/supplier would be able to track the status of processing of their bills online. Thus, the new system will bring in lot of efficiency and transparency in the system and is a big citizen-centric decision of the Government of India.
- g) The e-Bill system has been developed by the Public Financial Management System (PFMS) Division in the office of the Controller General of Accounts in the Department of Expenditure, Ministry of Finance. The bills will be processed by First-In-First-Out (FIFO) method.
- h) In addition to promoting ease of doing business and brining convenience to lakhs of vendors/suppliers, the e-Bill system will be environment friendly, eliminating the need to submit crores of paper bills annually and will thus save tonnes of paper every year. The e-Bill system has an elaborate digital storage facility for retrieval of documents and a robust audit trail.

#### **Revised procedure for release of funds under Centrally Sponsored Schemes:**

For better monitoring of availability and utilization of funds released to the States under the Centrally Sponsored Schemes (CSS) and to reduce

float. The Department of Expenditure has modified the procedure for release of funds under CSS and Every State Government will designate a Single Nodal Agency (SNA) for implementing each CSS. Brief on Process Flow for SNA Model:

- a) Every State Government will designate a Single Nodal Agency (SNA) for implementing each CSS. The SNA will open a Single Nodal Account for each CSS at the State level in a Scheduled Commercial Bank.
- b) After opening of Single Nodal Account of the scheme and before opening zero balance subsidiary account of IAs or assigning them drawing rights from SNA's account, the IAs at all levels shall return all unspent amounts lying in their accounts to the Single Nodal Account of the SNA.
- c) The SNAs shall ensure that the interest earned from the funds released should be mandatorily remitted to the respective Consolidated Funds on pro-rata basis in terms of Rule 230(8) of GFR, 2017.
- d) Funds available in the bank account of SNA should not be more than 25% of the amount likely to be released (including state share) under a CSS to a State for 2022-23.
- e) SNAs and IAs will mandatorily use the EAT module of PFMS or integrate their systems with the PFMS to ensure that information on PFMS is updated by each IA at least once every day.
- f) In case of CSS having no State share and where as per the scheme guidelines, funds are released by the Central Ministry/Department directly to the districts/blocks/Gram Panchayats/Implementing agencies, the requirement of notifying a single Nodal Agency and opening of a Single Nodal Account at the State level may be waived by the Secretary of the Central Ministry/Department concerned in consultation with the Financial Adviser.

#### **C. Revised procedure for release of funds under Central Sector Schemes:**

In suppression of all previous issued orders, Ministry of Finance, Department of Expenditure has issued an O.M. No. F.No.1(18)/PFMS/FCD/2021 dated 09th March 2022 mentioning Guidelines/Procedure for flow of funds under Central Sector Schemes by designating Central Nodal Agency (CNA) regarding release of funds under the Central Sector Schemes. The procedure effective from 1 April 2022 by the Ministries/Departments of

## DEPARTMENTAL ACCOUNTING ORGANISATION

Government of India for flow of funds under the Central Sector Schemes have been divided in two Models:

**I) Implementation through Treasury Single Account (TSA) Model I-** This model will be applicable in case of Central Sector Schemes having annual outlay of more than Rs. 500 crores and implemented without involvement of State agencies. It shall be mandatory to implement such schemes through the Treasury Single Account (TSA) Model.

**II) Implementation through Scheduled Commercial Banks (SCB) Model II-** This model will be applicable in case of Central Sector Schemes having (A) annual outlay of less than ₹ 500 crores or (B) the schemes are being implemented by agencies of the State Governments exclusively or in addition to the Central Agencies or (C) other schemes not covered in Model-I.

Brief on Process Flow for Central Sector Schemes:

- a) Identification of Central Sector Schemes for Implementation through Model I or Model-II.
- b) Notification of ABs/CPSEs/Implementing Agencies as Central Nodal Agencies (CNA).
- c) Open Assignment Account with RBI (e-Kuber) for each scheme under Model-I.
- d) Open an Account for each scheme in scheduled commercial banks (SCB) under model II.
- e) Listing and Closure of existing Bank Accounts of CNA and SAs.
- f) Balance in Account must be transferred to Consolidated Fund of India (CFI) under Model I and Unspent amount of the scheme is returned by all the Sub Agencies (SA's) to the CNA account under Model II.
- g) Interest earned from the funds is remitted to the Consolidated Fund of India (CFI) under Model II.
- h) Mandatorily use of EAT module of PFMS or integration of their systems with the PFMS.

### **D. Consolidated instruction on various aspects of Security while using PFMS:**

Ministry of Finance, Department of Expenditure, Office of the Controller General of Accounts vide O.M. No. 1-17016/1/2022-ITD-CGA/10985/229 dated 30 September 2022 has issued consolidated instructions on various aspects of security while using PFMS:

#### **a) Access Management:**

- i) For new user registration of officials dealing with PAO and DDO module of PFMS, only NIC/GOV domain email id will be allowed. Same email-id and mobile number can be used maximum for four user ids within same PAO code and additional three user ids for across PAO codes keeping in view of multiple charges handled by users in different field offices.
- ii) A system of two levels approval for creation of user and e-mail/SMS alert on creation of users to approvers has been built into the system.
- iii) Marking of inactive user ids > 45 days as disabled is being enforced in PFMS.
- iv) At the time of relieving of any Group A and Group B Officer who is a user in PFMS, viz. CCA level user, PAO type user, his/her digital signature and user id should be deactivated.
- v) A notification to alert the user for change is given in case user login in the system other than the system generally being used by the user.

#### **b) Password Policy in PFMS:**

- i) Password should be of length of minimum 8 characters.
- ii) Password mandatorily should include both special as well as Alpha numeric Characters.
- iii) Password should not have similarity with user name or part of the user name.

#### **c) Processing of Payments:**

- i) The I Key/DSC of the Pr. AO has to be invariably approved by the CCA level user, whereas I Key/DSC of PAOs by the Pr. Accounts Officer level user and that of the CDDOs by the PAO level user. The Timeout procedure for inserting the I Key/DSC for every session has been made in PFMS.
- ii) PAOs may be advised strictly not to access the PAO/DDO module and not use digital signatures for making payment from the computers installed outside their office locations.
- iii) All guidelines stipulated to be followed for making payments should be strictly adhered to and verification against physical documents should be done at all levels unless stipulated by explicit directions for user of electronic mediums.
- iv) All Pay and Accounts Officers authorized for making payments shall verify each payment

file of a batch with the corresponding physical bill/e-bill without fail before putting the digital signature.

#### **d) Network Security:**

- i) Always use genuine software, install the latest updates/patches for operating system, Antivirus and Application Software.
- ii) Enable firewall, Limit user privileges on the computer, Check and verify email sender IDs and web links before opening file attachments.
- iii) Use strong passwords, Protect against social engineering attacks.
- iv) Use only official supplied USB storage media.
- v) Users should be periodically briefed about Cyber Security measures.
- v) Avoid downloading and installing pirated software.
- vii) Internet-connected computers should not be used for drafting/storing sensitive official documents/correspondences.

#### **E. Some Other New Initiatives:**

- Implementation of DoE guidelines on TSA/SNA/CNA in letter and spirit.
- The statement of scheme-wise expenditure, unspent balances, outstanding UCs, scheme wise and state wise MIS of excess/deficit transfer from treasury to SNA, fund available in SNA account, interest remitted to CFI, status of legacy data are being shared with the program division on weekly basis for monitoring of fund flow and helping them in just in time (JIT) release.
- A series of training has been organized by Principal Accounts Office on e-bill and TSA module of PFMS to all the stakeholders including divisional heads.
- A special drive was launched for settlement of outstanding MEA debit claims.
- Delay in payment to seller/supplier in government e-market place (GeM) and status of pending bill with reference to block budget as per PFMS are being informed to respective Head of Department with a copy to PPS to Secretary and AS and FA so that payment could be released within stipulated timeline prescribed by DoE.
- Internal Audit Committee headed by Chief Accounting Authority, i.e. Secretary (DA&FW)

have been set up in terms of O/o CGA OM. A special drive for liquidation of outstanding internal audit paras have been launched in 2022-23 and periodical review of outstanding paras has taken place in SoM chaired by Secretary on weekly basis.

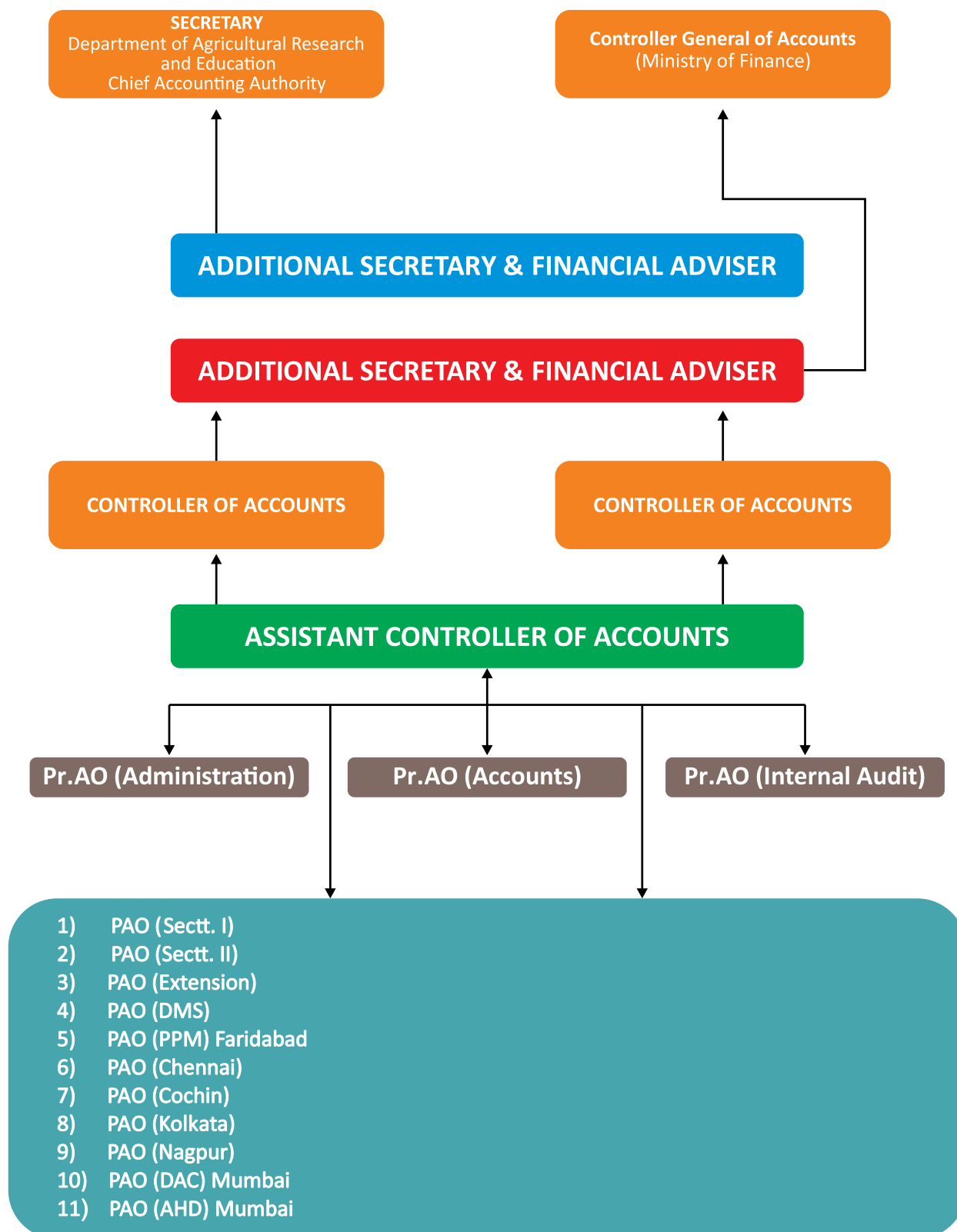
- Setting up of committee for NPS oversight mechanism and uploading of quarterly report in NPS dashboard along with comments of Financial Advisor.
- Designation based e-mail has been opened for all officials of Principal cum Pay & Accounts Office.
- Special campaign 2.0 for disposal of pending matter including RTI, PG and VIP references.
- Pan India training cum roll-out plan for electronic bill system (e-bill) of PFMS in 2022-23.
- Operationalization of revised/new Object Heads of Accounts under Rule (8) of DFPR issued vide DoE notification dated 12.12.2022 and O/o CGA OM dated 15.12.2022 and a workshop was also organized by Principal cum Pay & Accounts Office in this regard.
- To improve the internal control and upgradation of skills, officers/officials working in Principal cum Pay & Accounts Office have been transferred as per CVC, DoP&T guidelines and instructions issued by O/o CGA.
- Implementation of 2<sup>nd</sup> factor biometric authentication through FIDO device to access PFMS.
- Opening of Scheme-wise bank account for release of 100% Central Financial Assistance to implementing Agencies and GIA (Salary, General & Creation of Capital Assets) to ABs other than TSA/SNA/CNA route.
- Celebration of Civil Accounts Week from 01.03.2023 to 07.03.2023.
- Enhancing efficiency of payment process by way of monitoring TM-02 report (under CAM report in payment tab) of PFMS on weekly and monthly basis.
- Constitution of PFMS cell in Principal cum Pay and Accounts Office under the chairmanship of DCA as the first port of call for the PD and IFD for any PFMS related issue in pursuance of MoF, DoE, PFMS division OM F.No. 8/(01)/PFMS/2023 dated 17.04.2023.
- Risk based audit of DARE schemes in terms of O/o CGA guidelines.



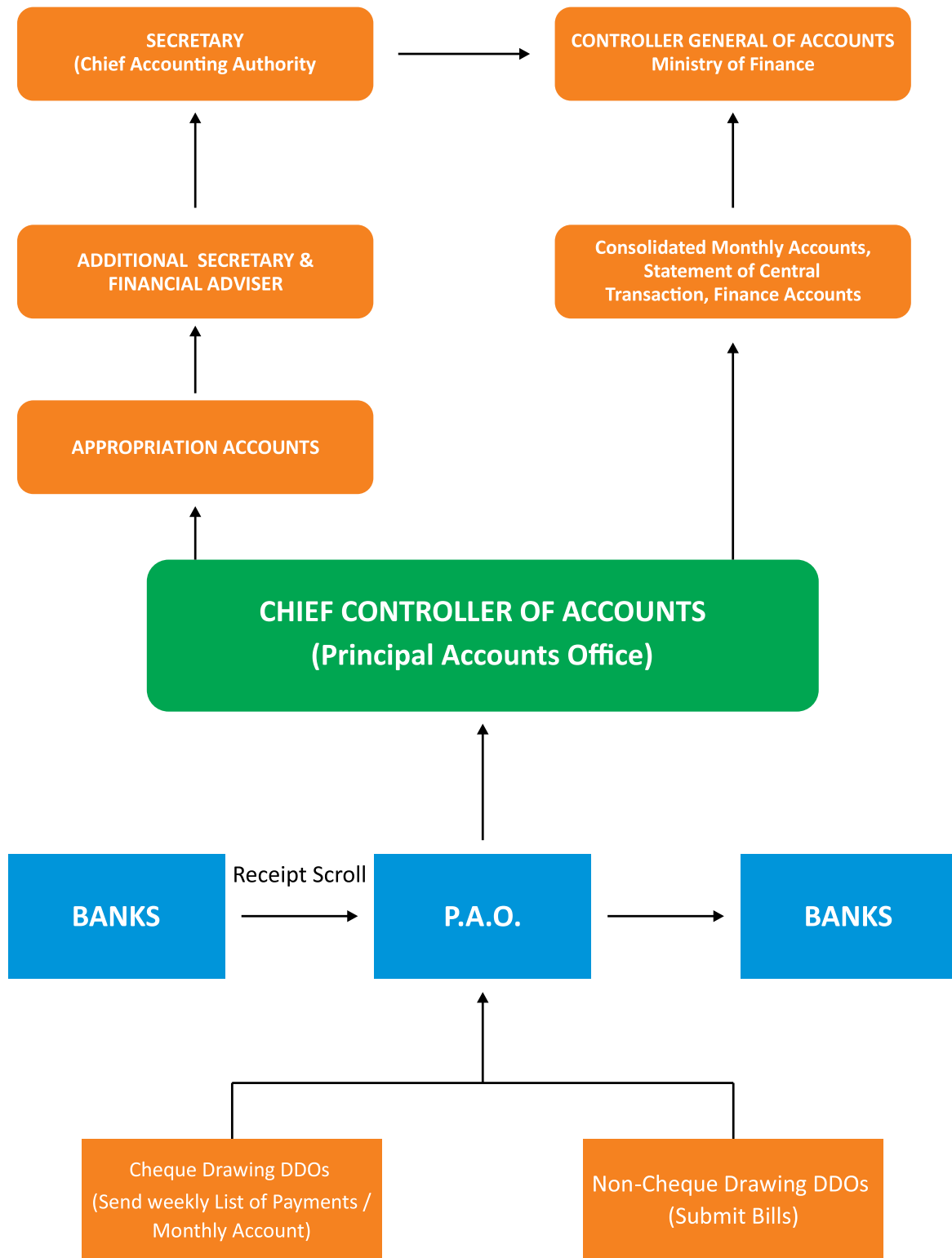
## DEPARTMENTAL ACCOUNTING ORGANISATION

- Implementation of new window based digital signing utility in place of existing Java based utility in the sanction module of PFMS.
  - Special drive for issue of qualifying service certificate by Head of Office to government servant in consultation with PAOs on time in terms of Rule 32 of Central Civil Pension Rules, 2021.
  - Reconciliation of expenditure between PAO and DDO on monthly basis.
  - Dealing with pension matters sensitively and on time.
  - Special drive for liquidation of CGA and C&AG audit paras.
  - Roll-out of processing of Electronic Inter Government Adjustment Advices (e-IGAA) in PFMS.
  - Preventive measures at various level to avoid any financial irregularities in terms of O/o CGA OM dated 19.07.2023.
- 8. The expenditure as on 31.10.2023 with reference to the B.E.2023-24 is given at Exhibit-C.**

## ACCOUNTING ORGANIZATION SETUP IN MINISTRY OF AGRICULTURE AND FARMERS WELFARE



**FLOW OF ACCOUNTING INFORMATION**





**Exhibit 'C'**

**Grant No. 02**  
**Department of Agricultural Research and Education**  
**Monitoring of Expenditure over BE**  
**Transaction Date: 01.04.2023 to 31.10.2023**

(₹ in Crores)

S. No.	Name of Scheme/Description	BE 2023-24	Progressive Exp. upto 31.10.2023	% age of expenditure over BE
1	2	3	4	
1	Establishment Expenditure of the Centre			
1.1	Secretariat	8.30	4.47	53.86%
1.2	Agricultural Scientists Recruitment Board (ASRB)	27.98	8.32	29.74%
1.3	International Cooperation - Other Programmes	7.43	0.08	1.08%
	Total - Establishment Expenditure of the Centre	43.71	12.87	29.44%
2	Central Sector Schemes/Projects			
2.1	Agriculture Extension	327.00	245.25	75.00%
2.2	Agriculture Engineering	65.00	48.75	75.00%
2.3	Natural Resource Management Institutes Including Agro Forestry Research	240.00	180.00	75.00%
2.4	Crop Sciences	714.41	535.81	75.00%
2.5	Horticultural Science	212.00	159.00	75.00%
2.6	Animal Science	300.00	225.00	75.00%
2.7	Fisheries Science	150.00	112.50	75.00%
2.8	Agricultural Universities and Institutions	322.74	242.06	75.00%
2.9	National Agricultural Higher Education Project (NAHEP)	92.26	54.60	59.18%
	Total - Central Sector Schemes/Projects	2423.41	1802.97	74.40%
3	Other Central Sector Expenditure			
3.1	Autonomous Bodies			
(i)	ICAR Headquarters	6384.59	4803.04	75.23%
(ii)	Central Agricultural Universities			
	CAU – Imphal	283.42	212.57	75.00%
	RLBCAU – Jhansi (Bundelkhand)	120.00	90.00	75.00%
	DRPCAUI -Pusa, Samastipur (Bihar)	248.11	186.08	75.00%
	TOTAL - Central Agricultural Universities	651.53	488.65	75.00%
(iii)	National Academy of Agricultural Sciences	0.76	0.38	50.00%
	Total (Autonomous Bodies)	7036.88	5292.07	75.20%
	Total - Other Central Sector Expenditure	7036.88	5292.07	75.20%
	Total (Grant No. 02)	9504.00	7107.91	74.79%



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**Table 1. List of ICAR Scientists permitted for Foreign Fellowship/Training**

S. No	Name and Institute	Fellowship	Place	Time Period	Funding	Date of issue
1	Ms. Vinita Ramtekey, Scientist, ICAR-IISS, Mau	For availing Netaji Subhash, ICAR International Fellowship 2021-22 for pursuing Ph. D	Department of Plant Breeding, The Institute of Crop Science and Resource Conservation, University of Bonn, Germany	25-10-2022 to 24-10-2025	ICAR under Netaji Subhash ICAR International Fellowship	14-10-2022
2	Mr. Chobhe Kapil Atmaram, Scientist, ICAR-IARI, New Delhi	ICAR International Fellowship	Texas A&M University, College Station, Texas, United States	17/01/2023 to 16/01/2023	ICAR under Netaji Subhash -ICAR International Fellowship	15-10-2022
3	Dr. G. K. Sivaraman, Pr. Scientist, ICAR-CIFT, Kochi	For availing ICMR-DHR International Fellowship for the year 2022-23	University of Southampton, Department of Engineering and Physical Science, United Kingdom	15-12-2022 to 15-03-2023	ICMR-DHR International Fellowship for the year 2022-23	18-11-2022
4	Mr. Rahul Chandora, Scientist, ICAR-National Bureau of Plant Genetics Resources, New Delhi	ICAR International Fellowship	The University of Queensland, Australia	10/01/2023 to 09/01/2026	ICAR under Netaji Subhash -ICAR International Fellowship	22-12-2022
5	Dr. Shyam Kumar T. S. Scientist, ICAR-Indian Veterinary Research Institute	Ph.D in the inter disciplinary area of stem cell biology and development of organoid models	Department of Veterinary and Biomedical Sciences, South Dakota State University, Brookings, South Dakota, USA	02/01/2023 to 31/12/2025	The expenditure of the visit shall be borne by Host Institute/the applicant himself	27-12-2022
6	Mr. Biswaranjan Behera, Scientist, ICAR-Indian Institute of Water Management, Bhubaneswar	Netaji Subhash – ICAR International Fellowship 2021-22	The University of Queensland, Australia	01/04/2023 to 31/03/2026	ICAR under Netaji Subhash -ICAR International Fellowship 2021-22	09-01-2023
7	Dr. Anshul Watts, Scientist, ICAR- National Institute for Plant Biotechnology, New Delhi	Training on the title Study the germination assay of Plant parasite broomrape ( <i>Phelipanche ramosa</i> )	Laboratory US2B UMR CNRS 6286 headed by Mr Bernard Offmann, University of Nantes, France	28/01/2023 to 08/02/2023	ICAR-National Institute for Plant Biotechnology	13-01-2023
8	Aradwad Pramod Pandurang, Scientist, ICAR-Indian Agricultural Research Institute, New Delhi	Netaji Subhash -ICAR International Fellowship 2021-22	Leibniz Institute of Agricultural Engineering and Bio-economy (ATB), Potsdam with registration at technical University of Berlin, Germany	13/02/2023 to 13/02/2026	ICAR under Netaji Subhash -ICAR International Fellowship 2021-22	01-02-2023
9	Dr. Raj Mukhopadhyay, Scientist, ICAR-Central Soil Salinity Research Institute, Karnal	Fulbright-Nehru Postdoctoral Research Fellowships 2022-23	Carnegie Mellon University, United States	01/04/2023 to 31/03/2025	United States-India Educational Foundation	03-02-2023



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S. No	Name and Institute	Fellowship	Place	Time Period	Funding	Date of issue
10	Dr. Mithilesh Kumar Singh, Scientist, ICAR- Indian Veterinary Research Institute, Izatnagar	ICMR-DHR International Fellowships	College of Food Agriculture of Environmental Sciences Ohio Agricultural Research and Development Centre (Centre for Food Animal Health, Wooster Ohio), The Ohio State University United States	24/03/2023 to 23/03/2024	ICMR-DHR Fellowship 2022-23	03-02-2023
11	Dr. Sudarshan Kumar, Sr. Scientist, ICAR- National Dairy Research Institute, Karnal	Fullbright-Nehru Fellowship	Oregon State University College of Public Health and Human Sciences, School of Biological and Population Health Sciences	25/03/2023 to 24/12/2023	Nehru-Fulbright fellowship (2022-23)	13-02-2023
12	Dr. Vishal Chander, Scientist, ICAR- IVRI, Mukteshwar Campus	Long term ICMR-DHR International Fellowship for Young Bio-Medical Scientists 2022-23	University of Missouri Columbia, USA	20-03-2023 to 20-03-2023	ICMR-DHR International Fellowship for Young Bio-Medical Scientists 2022-23	06-03-2023
13	Dr. Salauddin Qureshi, Pr. Scientist, ICAR- IVRI, Izatnagar	Short term ICMR-DHR International Fellowship for Young Bio-Medical Scientists 2022-23	University of Toledo, Toledo, Ohio, USA	18-03-2023 to 17-06-2023	ICMR-DHR International Fellowship for Young Bio-Medical Scientists 2022-23	06-03-2023
14	Dr. Rajanna G.A., Scientist, ICAR-Directorate of Groundnut Research, RRS Anantpur	Pursuing Post-Doc fellowship	Crop Production Systems Research Unit USDA (U.S Department of Agriculture)	03/04/2023 to 02/04/2024	Crop Production Systems Research Unit, USDA	09-03-2023
15	Dr. Sangeeta Mohanty/Lenka, Scientist, ICAR- Indian Institute of Soil Sciences, Bhopal	Indo-US visiting Fellowship	Dr. Rameshwar Kanwar, Iowa State University in Ames, Iowa, United States	01/05/2023 to 31/07/2023	USDA Foreign Agricultural Service, USDA FAS	25-04-2023
16	Dr. Dwijesh Chandra Mishra, Sr. Scientist, ICAR-Indian Agricultural Statistics Research Institute, New Delhi	Post Doctoral Fellowship	University of Cincinnati, Cincinnati, Ohio State, USA	01/05/2023 to 30/04/2024	Host Institute	01-05-2023
17	Dr. Ashim Datta, Scientist, ICAR- CSSRI, Karnal	Indo-US visiting Fellowship	Michigan State University, East Lansing, USA	01-06-2023 to 31-05-2025	Host Institute	03-05-2023

S. No	Name and Institute	Fellowship	Place	Time Period	Funding	Date of issue
18	Dr. Dhandapani R., Scientist, ICAR-Indian Agricultural Research Institute, New Delhi	Availing post-doctoral fellowship	University of Missouri (UoM), Columbia, MO 65211-7140, USA	01/07/2023 to 30/06/2024	University of Missouri (MU) has offered a consolidated fellowship of \$ 40,000 per annum for livelihood, accommodation, visa, air travel, and medical insurance etc. at University of Missouri, Columbia, MU, USA	09-05-2023
19	Mr. Uday Chandra Jha, Scientist, ICAR-Indian Institute of Pulses Research, Kanpur	Post-doctoral fellowship	Kansas State University, USA	01/07/2023 to 30/06/2024	Host Institute	31-05-2023
20	Mr. Selvakumar R, Scientist, ICAR-Indian Agricultural Research Institute, New Delhi	Training on the title "Irrigation and Fertigation Technologies for Sustainable Crop Production"	MASHAV Israel's Agency for International Development Cooperation, Ministry of Foreign Affairs, Jerusalem, Israel	05/06/2023 to 22/06/2023	MASHAV Israel's Agency for International Development Cooperation, Ministry of Foreign Affairs, Jerusalem	02-06-2023
21	Mr. Gurumurthy S., Scientist, ICAR- National Institute of Abiotic Stress Management, Baramati	Post-doctoral fellowship	Kansas State University, Kansas, United States	01/07/2023 to 30/09/2023	The expenditure of accommodation and food shall be borne by the host institute and other traveling, visa fees and health insurance shall be borne by the applicant	22-06-2023
22	Dr. Dwijesh Chan dra Mishra, Sr. Scientist, ICAR-Indian Agricultural Statistics Research Institute, New Delhi	Post Doctoral Fellowship	University of Cincinnati, Cincinnati, Ohio State, USA	04/09/2023 to 03/09/2024 instead of earlier from 26/06/2023 to 25/06/2024	University of Cincinnati, Cincinnati, Ohio State, USA	14-08-2023
23	Mr. Potdar Rahul Rajaram, Scientist, ICAR-Central Institute of Agricultural Engineering, Bhopal	Sixth Training of Trainers of the Asian and Pacific Network for Testing of Agricultural Machinery (ANTAM)	Kasetsart University and the Japan Institute of Agricultural Machinery, National Agriculture and Food Research Organization, Thailand	04/09/2023 to 08/09/2023	Centre for Sustainable Agricultural Mechanization of the United Nations Economic and Social Commission for Asia and the Pacific	18-08-2023

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S. No	Name and Institute	Fellowship	Place	Time Period	Funding	Date of issue
24	Mr. Dilip Jat, Scientist, ICAR-Central Institute of Agricultural Engineering, Bhopal	Sixth Training of Trainers of the Asian and Pacific Network for Testing of Agricultural Machinery (ANTAM)	Kasetsart University and the Japan Institute of Agricultural Machinery, National Agriculture and Food Research Organization (IAM-NARO) in Kamphaeng Saen, Thailand	04/09/2023 to 08/09/2023	United Nations Economic and Social Commission for Asia and the Pacific (ESCAP-CSAM)	18-08-2023
25	Dr. Rajkumar Dhakar, Scientist, ICAR-Indian Agricultural Research Institute, New Delhi	Fullbright-Nehru Fellowship	Biological System Engineering, Washington State University, United States	20/09/2023 to 19/09/2024	United States-India Educational Foundation and J. William Fulbright Foreign Scholarship Board (FFSB), Washington D.C.	11-09-2023
26	Mr. Tushar Kanti Dutta, Scientist, ICAR-Indian Agricultural Research Institute, New Delhi	Fulbright-Nehru Fellowship	University of California, Davis, United States	29/03/2024 to 27/12/2024	United States-India Education Foundation (USIEF) under Nehru- Fulbright fellowship (2023-24)	14-09-2023

### Annexure-II

**Table 2. List of ICAR Scientists permitted for extension of Fellowship/Training**

S. No	Name and Institute	Fellowship	Place	Time Period	Funding	Date of issue
1	Shri Mukesh Kumar Choudhary, Scientist, ICAR-IIMR, Ludhiana	Extension of foreign visit for pursuing Ph D	School of Agriculture and Environment, University of Australia, Perth, Western Australia	30-10-2022 to 29-04-2023		01-12-2022
2	Dr. Vishal Singh, Scientist, ICAR-IIMR, Ludhiana	Extension for completing Ph. D programme	Utah State University, Logan, Utah, USA	20.12.2022 to 30.06.2023 beyond prescribed period of 3 years from 20.12.2019 to 19.12.2023		31-01-2023
3	Shri Manish Kumar, Scientist, ICAR-Central Soil Salinity Research Institute, Karnal	Extension for completing Ph.D programme under Netaji Subhash ICAR International Fellowship	University of Wurzburg, Germany	14.10.2022 to 31.03.2023 beyond prescribed from 14.10.2019 to 13.10.2022		14-03-2023



S. No	Name and Institute	Fellowship	Place	Time Period	Funding	Date of issue
4	Mr. Pushpendra Koli, Scientist, ICAR- Indian Grassland and Fodder Research Institute, Jhansi	Extension for completing Ph.D programme under Netaji Subhash ICAR International Fellowship	Murdoch University, Australia	15.03.2023 to 15.09.2023 beyond prescribed from 16.03.2020 to 15.03.2023		12-06-2023
5	Shri Mukesh Kumar Choudhary, Scientist, ICAR- IIMR, Ludhiana	Extension for completing his Ph.D	School of Agriculture and Environment, University of Australia, Perth, Western Australia	30.04.2023 to 20.10.2023 beyond 29.04.2023		27-07-2023

## Annexure-III

Table 3. List of ICAR Scientists permitted for rescheduling of fellowship/training

S. No	Name and Institute	Fellowship	Place	Time Period	Funding	Date of issue
1	Dr. Binsila B. Krishnan, Scientist, ICAR- National Institute of Animal Nutrition and Physiology, Bangalore	Rescheduling for SERB Fellowship under SERB International Research Experience 2022-23,	The Roslin Institute, RDSVS, University of Edinburgh, United Kingdom	24-10-2022 to 22-12-2022 Instead of Earlier from 02/08/2022 to 01/10/2022	SERB, DST, Government of India under International Research Experience (SIRE)	10-10-2022
2	Mr. Rajkumar Uttamrao Zunjare, Scientist, ICAR- Indian Agricultural Research Institute, New Delhi	Rescheduling for SERB Fellowship under SERB International Research Experience 2022-23	Department of Agronomy, Iowa State University, USA	01-11-2022 to 30-04-2023 Instead of Earlier from 01/08/2022 to 31/01/2023	SERB, DST, Government of India under International Research Experience (SIRE)	10-10-2022
3	Ms. Vinita Ramtekey, Scientist, ICAR- IISS, Mau	Rescheduling for availing Netaji Subhash, ICAR International Fellowship 2021-22 for pursuing Ph. D	Department of Plant Breeding, The Institute of Crop Science and Resource Conservation, University of Bonn, Germany	15-12-2022 to 14-12-2025 Instead of Earlier from 25-10-2022 to 24-10-2025	ICAR under Netaji Subhash ICAR International Fellowship	03-11-2022
4	Dr. G. K. Sivaraman, Pr. Scientist, ICAR- CIFT, Kochi	Rescheduling for availing ICMR-DHR International Fellowship for the year 2022- 23	University of Southampton, Department of Engineering and Physical Science, United Kingdom	01-01-2023 to 31-03-2023 Instead of Earlier from 15-12-2022 to 15-03-2023	ICMR-DHR International Fellowship for the year 2022-23	22-11-2022
5	Dr. Dwijesh Chandra Mishra, Scientist, ICAR- IASRI, New Delhi	Rescheduling for attending Post Doctoral Fellowship	Department of Environmental and Public Health Sciences, University of Cincinnati, Ohio State, USA	23-01-2023 to 22-01-2024 Instead of Earlier from 10-10-2022 to 09-10-2023	Host Institute	02-12-2022

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S. No	Name and Institute	Fellowship	Place	Time Period	Funding	Date of issue
6	Dr. G.K. Sivaraman, Pr. Scientist, ICAR-CIFT, Kochi	Rescheduling for ICMR- DHR International Fellowship for the year 2022- 23	University of Southampton, Department of Engineering and Physical Sciences United Kingdom	10-02-2023 to 10-05-2023 Instead of earlier from 01-01-2023 to 31-03-2023	ICMR	07-02-2023
7	Dr. Sangeeta Mohanty /Lenka, Scientist, ICAR-Indian Institute of Soil Sciences, Bhopal	Rescheduling for Indo US visiting Fellowships	Dr. Rameshwar Kanwar, Iowa State University in Ames, Iowa, United States	08-05-2023 to 07-08-2023 Instead of earlier from 01-05-2023 to 31-07-2023	USDA Foreign Agricultural Service, USDA FAS	08-05-2023
8	Dr. Rajanna G. A., Scientist, ICAR- Directorate of Groundnut Research, RRS, Anantpur	Rescheduling Post-Doctoral Fellowship	Crop Production Systems Research Unit, USDA (US Department of Agriculture)	20/06/2023 to 19/06/2024 (excluding journey time) instead of earlier from 03/04/2023 to 02/04/2024		12-06-2023
9	Dr. Dwijesh Chandra Mishra, Sr. Scientist, ICAR-Indian Agricultural Statistics Research Institute, New Delhi	Post Doctoral Fellowship	University of Cincinnati, Cincinnati, Ohio State, USA	26/06/2023 to 25/06/2024 instead of earlier from 01/05/2023 to 30/04/2024	University of Cincinnati, Cincinnati, Ohio State, USA	22-06-2023
10	Dr. Dhandapani R., Scientist, ICAR-Indian Agricultural Research Institute, New Delhi	Rescheduling of Post Doctoral Fellowship	University of Missouri (UoM), Columbia, USA	01/10/2023 to 30/09/2024 Instead of earlier from 01/07/2023 to 30/06/2024		22-08-2023
11	Dr. Shubhadeep Ghosh, ADG(MF), ICAR Hqrs. New Delhi	Rescheduling of assess the scope and requirement of Mariculture Research	Sri Lanka	22/09/2023 to 03/10/2023 Instead of earlier From 15/09/2023 to 26/09/2023		11-09-2023

**Table 4. List of ICAR Scientists permitted of NOC for fellowship/training**

S. No	Name and Institute	Fellowship	Place	Time Period	Funding	Date of issue
1.	Dr. Rituparna Banerjee, Scientist, ICAR- National Meat Research Institute, Hyderabad	Fulbright Nehru Fellowship	Department of Animal and Food Sciences, Oklahoma State University, Stillwater, Oklahoma, USA	01/02/2025 to 30/09/2025		15-05-2023
2	Dr. Shobha Joe Kizhakudan, Pr. Scientist, ICAR- CMFRI, Chennai	NOC Virtual Meeting on CITES- NDF Working group on Non-Detriment Findings for Marine and Aquatic Species hosted by IUCN and CITES		April- August, 2023		03-05-2023
3	Dr. I Ramakrushna Gandhiji, Sr. Scientist, ICAR- CICR, Nagpur	NOC for applying training	International Cotton Advisory Committee (ICAC), Washington, USA	18/09/2023 to 27/09/2023		01-08-2023
4	Dr. Rishi Kumar, Pr. Scientist, ICAR- Central Institute of Cotton Research, Nagpur	NOC for applying training	International Cotton Advisory Committee (ICAC), Washington, USA	18/09/2023 to 27/09/2023		01-08-2023

**Table 5. List of ICAR Scientists permitted for ADHOC Visit**

S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
1	Dr. G. Suja, Pr. Scientist, ICAR- CTCRI, Thiruvananthapuram	To attend as Speaker to the 5 <sup>th</sup> Organic Asia Congress	Goesan Country, South Korea	13-15 October, 2022	International Federation of Organic Agriculture Movements (IFOAM) Organic Asia	04-10-2022
2	Dr. Devendra Kumar Yadav, ADG(Seed), ICAR, New Delhi	Deposition of wheat and Chickpea germplasm as safety Duplicates to Svalbard Global Seed Vault (SGSV)	Nordgen, Norway	10/10/2022 to 12/10/2022	International head of ICAR	04-10-2022
3	Dr. Biplab Sarkar, Sr. Scientist, ICAR-IIAB, Ranchi	To participate as Speaker for Plenary Lecture in the Bilateral International Conference	The Khulna University, Bangladesh	19-20 October, 2022	Host Institute	07-10-2022
4	Dr. Rajesh M.K., Pr. Scientist, ICAR- Central Plantation Crop Research Institute, Kerala	50 <sup>th</sup> International COCOTECH Conference and Exhibition	Kuala Lumpur, Malaysia	07/11/2022 to 11/11/2022	International Coconut Community	07-10-2022
5	Dr. K.Banerjee, Pr. Scientist, ICAR- NRCG, Pune	21 <sup>st</sup> International Union of Food Science and Technology, World Food Congress	Marina Bay Sands Expo & Convention centre, Singapore	31/10/2022 to 03/11/2022	Organizers, World Food Congress	14-10-2022



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S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
6	Dr. Veena Gupta, Pr. Scientist, ICAR-NBPGR, New Delhi.	TropAg Conference	Brisbane Convention & Exhibition Centre, Brisbane, Australia	31/10/2022 to 02/11/2022	Applicant	14-10-2022
7	Dr. Vinod Kumar Singh, Director, ICAR-Central Research Institute of Dryland Agriculture, Hyderabad	27 <sup>th</sup> session of the Conference of the Parties (COP 27) of the United Nations Framework Convention on Climate Change (UNFCCC), 17 <sup>th</sup> Session of Conference of the parties serving meeting of the parties to the Kyoto Protocol (CMP 17) and 4 <sup>th</sup> session of the Conference of the Parties serving as the member of the Parties to the Paris Agreement (CMA 4)	Sharm El Sheikh, Egypt	06/11/2022 to 18/11/2022	ICAR-Central Research Institute of Dryland Agriculture, Hyderabad.	20-10-2022
8	Dr. K.N. Bhilegaonliar, Pr. Scientist, ICAR-Indian Veterinary Research Institute, Izatnagar	Workshop and Annual Meeting of International Commission on Microbiological Specifications for Foods (ICM. SF) and Dubai International Food Safety Conference (DIFSC)	Dubai. UAE	31/10/2022 to 11/11/2022	Host- International commission on Microbiological Specifications for Foods	20-10-2022
9	Dr. A.K. Srivastava. Pr. Scientist, ICAR-Central Citrus Research Institute. Nagpur	XIV International Citrus Congress 2022	University of Cukurova, Mersin, Turkey	05/11/2022 to 11/11/2022	Host. Organizing Secretary of IXV International Citrus Congress-2022, Mersin, Turkey	20-10-2022
10	Dr. Kuldeep Tripathi, Scientist, ICAR-National Bureau of Plant Genetic Resources, New Delhi	TropAg conference	Brisbane Convention & Exhibition Centre, Brisbane, Australia	31/10/2022 to 02/11/2022	Applicant / Department of Science & Technology (DST) DST- SERB will provide to and fro economic class air-fare, airport tax, visa fees & registration fees	21-10-2022
11	Mr. Gurumurthy S., Scientist, ICAR-National Institute of Abiotic Stress Management, Pune	Interdrought- 2022 The 7 <sup>th</sup> Congress on Plant Production in Water Limited Environment	King Fahd Hotel, Dakar, Senegal, Africa	28/11/2022 to 02/12/2022	M/S Ashwathy Green Enterprise Pvt. Ltd., Chennai, Tamil Nadu	31-10-2022
12	Dr. U. R. Badegonakar, Pr. Scientist, ICAR-Central Institute of Agriculture Engineering, Bhopal	Conservation Agriculture Sustainable Intensification Consortium's (CASI C) 3 <sup>rd</sup> Regional Workshop	Siem Reap and Battambang Province, Cambodia	02/11/2022 to 04/11/2022	CSAM- UNESCAP	31-10-2022

S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
13	Dr. Vinayak Hegde, Pr. Scientist, ICAR-Central Plantation Crops Research Institute, Kasaragod	50 <sup>th</sup> International COCOTECH Conference and Exhibition	Kuala Lumpur, Malaysia	07/11/2022 to 11/11/2022	International Coconut Community	04-11-2022
14	Dr. S. K. Malik, Pr. Scientist, ICAR-NBPGR, New Delhi	International Citrus Congress- 2022	Mersin, Turkey	06/11/2022 to 11/11/2022	Department of Biotechnology/Self	04-11-2022
15	Dr. R.G. Gracy, Sr. Scientist, ICAR-National Bureau of Agricultural Insect Resources, Bengaluru.	ADHOC Symposium	Vancouver, British Columbia, Canada	13/11/2022 to 16/11/2022	ICAR-National Bureau of Agricultural Insect Resources, Bengaluru/DST-SERB International Travel Support	09-11-2022
16	Dr. Krishna Murthy S.L., Sr. Scientist, ICAR- Central Soil Salinity Research Institute, Karnal	Japan International Award for Young Agricultural Researchers (Japan Award)	Hitotsubashi University, Tokyo, Japan	22/11/2022 to 23/11/2022	Japan International Research Centre for Agricultural Sciences	14-11-2022
17	Dr. Praveen Malik, Pr. Scientist, ICAR, New Delhi	ADHOC on Lumpy Skin Disease Virus.	Dubai, UAE	16/11/2022 to 18/11/2022	Bill and Melinda Gates Foundation	14-11-2022
18	Dr. Narendra Kumar, Pr. Scientist, ICAR-Indian Institute of Pulse Research, Kanpur	8 <sup>th</sup> International Weed Science Congress	Marriott, Marquis Queen's Park, Bangkok, Thailand	04/12/2022 to 09/12/2022	DST/Applicant	14-11-2022
19	Dr. Vijayakumar S., Scientist, ICAR-Indian Institute of Rice Research, Hyderabad	Adhoc Conference on the title Seed production and shattering of barnyard grass ( <i>Echinochloa crus-galli</i> ) in response to time of emergence and crop geometry in transplanted rice	Weed Science Society of Thailand (WSST) and the International Weed Science Society (IWSS) in Bangkok, Thailand	04/12/2022 to 09/12/2022	Ticket fare will be met from Indian Society of Weed Science - Jabalpur. Maximum limit Rs. 35000. Visa, Registration will be met from SERB, DST travel grant - For registration maximum limit is Rs. 50000. Lodging and accommodation expenses will be met from externally funded project (Comparative assessment of Aldor as an alternative to Urea on yield and nutrient use efficiency of irrigated rice ecosystem)	18-11-2022
20	Dr. Anand Kumar Singh, DDG(Hort.), ICAR Headquarters, New Delhi	'Seed without Borders' Workshop, being organised by World Bank	World Bank, Thimphu, Bhutan	21/11/2022 to 24/11/2022	World Bank	18-11-2022
21	Dr. Sunil Archak, Pr. Scientist, ICAR-NBPGR, New Delhi	Indian Delegation for CoP-15.2 to CBD Meeting	Montreal, Canada	03/12/2022 to 19/12/2022	MOEFCC as nodal agency for CBD	02-12-2022
22	Dr. Ramesh S.V. Scientist, ICAR-Central Plantation Crops Research Institute, Kasaragod	International Symposium on Cocoa Research	Montpellier, France	05/12/2022 to 07/12/2022	DST- SERB/ Organizers	

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S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
23	Dr. Anupama Singh, Joint Director (Edn.), ICAR-IARI, New Delhi	Regional Workshop on CABI	Nepal	23-12-2023	CABI	22-12-2023
24	Dr. P. Revathi, Sr. Scientist, ICAR- Indian Institute of Rice Research, Hyderabad	International Plant and Animal Genome Conference	San Diego, California, USA	12-01-2023 to 18-01-2023	Organizer and Applicant	10-01-2023
25	Dr. Jai Prakash Mishra, ADG (IR), ICAR, New Delhi.	15 <sup>th</sup> Global Forum for Food and Agriculture (GFFA) and the 15 <sup>th</sup> Berlin Agriculture Ministries Conference	The Federal Ministry of Food and Agriculture, Germany	19-01-2023 to 21-01-2023	ICAR Hqrs.	13-01-2023
26	Dr. Mahesh Chander, Pr. Scientist, ICAR-IVRI, Izatnagar	Asia wide Regional Learning Workshop on strengthening Extension and Advisory Services in the region	Asia Pacific Islands Rural Advisory Services Network. Bangkok, Thailand	24-01-2023 to 26-01-2023	Global Forum for Food and Agriculture (GFFA), Switzerland	19-01-2023
27	Dr. Dharumarajan S., Sr. Scientist, ICAR- National Bureau of Soil Survey and Land Use Planning, Nagpur	2 <sup>nd</sup> Joint International workshop for Digital Soil Mapping and Global Soil Map	Le Studium, Orleans, France	07-02-2023 to 09-02-2023	Le Studium, Institute for advanced studies Orleans, France	20-01-2023
28	Dr. Vinod Kumar Singh, Director, ICAR- Central Research Institute of Dryland Agriculture, Hyderabad	Workshop on Agronomy R&D Priorities for Climate Change Adaption and Mitigation	CGIAR and Bill & Melinda Gates Foundation, Nairobi, Kenya	01-02-2023 to 02-02-2023	Bill & Melinda Gates Foundation,	27-01-2023
29	Dr. Vikram Singh, Sr. Scientist, ICAR, New Delhi	ADHOC Conference	Division of Business Law, Nanyang Business School, Nanyang Technological University, Singapore	01-03-2023 to 03-03-2023	ICAR Hqrs.	06-02-2023
30	Dr. Naveen Kumar, Scientist, ICAR- National Institute of High Security Animal Diseases, Bhopal	Biorisk and Biosafety Gap Assessment workshop	Renaissance Baltimore Harboplace Hotel, Baltimore, Maryland, USA	09-02-2023 to 10-02-2023		07-02-2023
31	Dr. Salini S., Scientist, ICAR-National Bureau of Agricultural Insect Resources, Bengaluru	International team of stink bug taxonomists on a venture on the systematics of the Brown Marmorated Stink Bug	The National Museum of Czechia (NMC), Prague, Czech Republic and the Natural History Museum (NHM), London, United Kingdom	04/04/2023 to 31/05/2023	Australian Government Department of Agriculture, Water and the Environment, that will be administered by the University of the New South Wales,	07-02-2023
32	Dr. Ajay Kumar, Pr. Sc., ICAR-Central Sheep and Wool Research Institute, Avikanagar	Be a part of technical verification team for proceeding to Qingdao, Shandong, China for verification of pashmina dehairing plant	Qingdao Yuanquan Machinery Co. Ltd, Wangtai Industry Park, Qingdao City, Shandong Province, China	02/02/2023 to 18/02/2023	Directorate of Animal/ Sheep Husbandry & Fisheries Department, UT, Ladakh, India	07-02-2023



S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
33	Dr. P. Dandapat, Sr. Scientist, ICAR-Indian Veterinary Research Institute, ERS, Kolkata	Participate in bovine tuberculosis roadmap meeting "Understanding current and future needs and priorities for bovine tuberculosis research and innovations"	STAR-IDAZ IRC (SIRCAH) International Research Consortium on Animal Health, UK	28-02-2023	Host institute	13-02-2023
34	Dr. Debasis De, Pr. Scientist, ICAR-Central Institute Brackish water Aquaculture, Chennai	International Symposium on Healthy Mangrove and Sustainable Fisheries for Climate Resilient Coastal Community	South Asia Khulna University and Bangladesh Environment and Development Society, Khulna, Bangladesh	01-03-2023 to 06-03-2023	Nature Environment & Wildlife Society, Bakul Bagan Row, Bhowanipore, Kolkata, West Bengal.	20-02-2023
35	Sandeep Bhatia, Pr. Scientist, ICAR-NIHSAD, Bhopal	Attending a Meeting of the South East Asia Regional GOARN Partners, WHO	Kathmandu, Nepal	15-03-2023 to 16-03-2023	WHO as per Organization's Policy	28-02-2023
36	Dr. Onkar Nath Tiwari, Pr. Scientist, ICAR-Indian Agricultural Research Institute, New Delhi	Attending ADHOC Conference on "Discovery of new strain, biosynthesis, purification and structure property relationships of cyanobacterial phycobilins with special emphasis in <i>Oscillatoria</i> sp. BTA 170"	Rome, Italy	13/03/2023 to 15/03/2023	The applicant	28-02-2023
37	Dr. Bhupendra Nath Tripathi, DDG (AS), ICAR, New Delhi	Attending a Meeting of the South East Asia Regional GOARN Partners, WHO	Kathmandu, Nepal	15-03-2023 to 16-03-2023	WHO as per Organization's Policy	02-03-2023
38	Dr. Anupama Singh, Joint Director, ICAR-Indian Agricultural Research Institute, New Delhi	Attending ADHOC Workshop on Food Security Self-Sufficiency, Surplus and Supply	Doha, Qatar	07/03/2023 to 09/03/2023	UPL Ltd. Vapi, Gujarat, India	07-03-2023
39	Dr. K. Vinod, Pr. Scientist, ICAR-CMFRI, Calicut Regional Station, Kozhikode	Attending a Regional Meeting	University of British Columbia, Vancouver BC Canada. The Workshop will be held in Mactan, Cebu, Philippines	14/03/2023 to 17/03/2023	Host Institute	06-03-2023

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S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
40	Dr. Rabi Narayan Sahoo., Pr. Scientist, ICAR-Indian Agricultural Research Institute, New Delhi	ICAR Representative to Dalhousie University, Canada for developing collaboration between Dalhousie University, the Indian Agricultural Research Institute, and other ICAR partnering institutions, particularly in the field of Precision Agriculture	Dalhousie University, Canada	10/04/2023 to 19/04/2023	Dalhousie University	09-03-2023
41	Dr. Akhilesh K.V., Scientist, ICAR-Central Marine Fisheries Research Institute, Regional Station, Calicut	Attend Online International Workshop on Fishmaw- Fisheries, Trade and Management	Online organized by Hong Kong University, Hong Kong with TRAFFIC South Africa; National Fisheries College, PNG; Fish Matter, Australia	21/03/2023 to 23/03/2023	As the program is online through video-conferencing no funding is required or used	09-03-2023
42	Mr. Subal Kumar Roul, Scientist, ICAR-Central Marine Fisheries Research Institute, Digba RS	Attend Online International Workshop on Fishmaw- Fisheries, Trade and Management	Online organized by Hong Kong University, Hong Kong with TRAFFIC South Africa; National Fisheries College, PNG; Fish Matter, Australia	21/03/2023 to 23/03/2023	As the program is online through video-conferencing no funding is required or used	09-03-2023
43	Dr. Akhilesh K.V., Scientist, ICAR-Central Marine Fisheries Research Institute, Regional Station, Calicut	Attending a IUCN SSC Shark Specialist Group workshop on the Global Status of Sharks, Rays and Chimaeras	Kuala Lumpur, Malaysia	18-03-2023 to 20-03-2023	Host Institute	10-03-2023
44	Dr. M. Madhu, Director, ICAR-Indian Institute of Soil and Water Conservation, Dehradun	Attending the India - Ethiopia Workshop on Agriculture	Addis Ababa, Ethiopia	21/03/2023	Research & Information System (RIS) for Developing Countries which is affiliated with Ministry of External Affairs, Govt. of India, New Delhi,	16-03-2023
45	Dr. Niveta Jain, Pr. Scientist, ICAR- Indian Agricultural Research Institute, New Delhi	Attend 21st Editorial board meeting and Data meeting for Emission Factor Database of Intergovernmental Panel on Climate Change (IPCC)	New Zealand	16/05/2023 to 19/05/2023	IPCC Trust Fund, Geneva	11-03-2023

S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
46	Dr. K. Madhavi Reddy, Pr. Scientist, ICAR-IIHR, Bengaluru	18 <sup>th</sup> EUCARPIA International Meeting on Genetics and Breeding of Capsicum and Eggplant	Plovdiv, Bulgaria	18-09-2023 to 21-09-2023	The Organizers	18-04-2023
47	Dr. S. Usha Rani, Pr. Scientist, ICAR-Central Institute of Cotton Research, Karnal	Attending and present papers in the 39th annual conference of the Association for International Agricultural and Extension Education (AIAEE) on "Technology, Pluralism and Inclusiveness in Agriculture, Food, and Environment"	International Agricultural and Extension Education (AIAEE) and School of Environmental Design and Rural Development (SEDRD), University of Guelph, Canada	26/04/2023 to 29/04/2023	Personal savings	21-04-2023
48	Dr. Archana Suman, Pr. Scientist, ICAR-Indian Agricultural Research Institute, New Delhi	Attending Workshop on 'Endophytic Microbes for Crop Nutrition: Reality or Myth?'	Bill & Melinda Gates Foundation, USA	16/05/2023 to 17/05/2023	Bill & Melinda Gates Foundation, USA	27-04-2023
49	Dr. Anudy Kumar, Pr. Scientist, ICAR-Indian Agricultural Research Institute, New Delhi	Attending Workshop on 'Endophytic Microbes for Crop Nutrition: Reality or Myth?'	Bill & Melinda Gates Foundation, USA	16/05/2023 to 17/05/2023	Bill & Melinda Gates Foundation, USA	27-04-2023
50	Dr. B. Ramakrishnan, Pr. Scientist, ICAR-Indian Agricultural Research Institute, New Delhi	Attending Workshop on 'Endophytic Microbes for Crop Nutrition: Reality or Myth?'	Bill & Melinda Gates Foundation, USA	16/05/2023 to 17/05/2023	Bill & Melinda Gates Foundation, USA	27-04-2023
51	Dr. Vikram Singh, Sr. Scientist, ICAR Headquarters (IPTM Unit), New Delhi	Adhoc Conference on IP and the Sustainable Development Goals (SDGs)	University of Haifa, Faculty of Law Mount Carmel, Haifa, Israel	28/05/2023 to 29/05/2023	ICAR-Budget Head, Travelling allowance- Foreign TA	08-05-2023
52	Dr. Ashok Kumar Mohanty, Joint Director, ICAR-Indian Veterinary Research Institute	11th Asia Oceania Human Proteome Organization (AOHUPO) and 7th Asia Oceania Agricultural Proteomics Organization (AOAPO) Congress	Max Atria, Singapore	08/05/2023 to 10/05/2023	11th Asia Oceania Human Proteome Organization (AOHUPO) and 7th Asia Oceania Agricultural Proteomics Organization (AOAPO) Congress	03-05-2023
53	Mr. Hanamant M Halli, Scientist, ICAR-National Institute of Abiotic Stress Management, Baramati	XXV International Grassland Congress: Grassland for Soil, Animal and Human Health	Covington, Kentucky, USA	14/05/2023 to 19/05/2023	Registration fee and accommodation support from the organizers (USA). Also got travel support from Department of Science and Technology (DST), SERB	04-05-2023



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S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
54	Dr. (Mrs.) Jyoti Kumari, Pr. Scientist, ICAR-National Bureau of Plant Genetic Resources, New Delhi	Collaborative Research Work Exposure Visit and Consultation Meetings	Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Gatersleben, Germany	04/06/2023 to 17/06/2023	Cost of accommodation, food and the logistics in Germany will be covered by German counterpart on behalf of bilateral project. Cost of visit from Indian side shall be borne by DA&FW, GOI/Self	12-05-2023
55	Dr. Chithra Devi Pandey, Sr. Scientist, ICAR-National Bureau of Plant Genetic Resources, New Delhi	Collaborative Research Work Exposure Visit and Consultation Meetings	Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Gatersleben, Germany	04/06/2023 to 17/06/2023	Cost of accommodation, food and the logistics in Germany will be covered by German counterpart on behalf of bilateral project. Cost of visit from Indian side shall be borne by DA&FW, GOI/Self	12-05-2023
56	Ms. Tincy Varghese, Scientist, ICAR-Central Institute on Fisheries Education, Mumbai	Attend Inland Saline Aquaculture Session at the World Aquaculture Conference and Trade Show in Darwin, Northern Territory, Australia, organized by World Aquaculture Society Hosted by Seafood Industry Australia	Darwin Convention Centre Darwin, Northern Territory, Australia	29/05/2023 to 01/06/2023	Host institute	18-05-2023
57	Dr. Anubhuti Sharma, Sr. Scientist, ICAR-Directorate of Rapeseed & Mustard Research, Bharatpur	Attend Meetings of ISO/TC 34/SC 2 and SC 11. Several ISO meetings are planned in France from 22 to 25 May 2023. She will be a part of the India delegation for the ISO/TC 34/SC 2 and ISO/TC 34/SC 11	Association Françoise De Normalization, Saint Denis La Plaine Cedex France	22-05-2023 to 25-05-2023	Bureau of Indian Standards (BIS), India	18-05-2023
58	Dr. Swarna Ronanki, Scientist, ICAR-Indian Institute of Millets Research, Hyderabad	Attend 2023 Global Sorghum Conference - "Sorghum in the 21st century: Resiliency and sustainability in the face of climate change	The French Agricultural Research Centre for International Development (CIRAD), Montpellier, France	05/06/2023 to 09/06/2023	International Travel Support (ITS) Scheme funded by Science and Engineering Research Board (SERB), a statutory body under the Department of Science and Technology, Government of India	18-05-2023

S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
59	Dr. Amaresh Chandra, Director, ICAR-Indian Grassland and Fodder Research Institute, Jhansi	Regional workshop on managing rangelands for multiple benefits"	International Centre for Integrated Mountain Development (ICMOD) GPO Box 3226, Kathmandu, Nepal	29/05/2023 to 30/05/2023	Host Institute	29-05-2023
60	Dr. Mahesh Chander, Pr. Scientist, ICAR-Indian Veterinary Research Institute, Izatnagar	6th Organic Asia Congress	The League of Organic Agriculture Municipalities, cities and Provinces in the Philippines, Kashagan, Lanao del Norte, Philippines	06/06/2023 to 09/06/2023	Host Institute, IFOAM	31-05-2023
61	Dr. A. Gopalakrishna, Director, ICAR-Central Marine Fisheries Research Institute, Cochin	"Fish stock identification & regional fisheries management" and to discuss collaborative activities between BOBP-CMFRI	Sri Lanka	30/05/2023 to 01/06/2023	BOBP-IGO will arrange all logistics related to the participation in the program including travel, accommodation and visa facilitation	31-05-2023
62	Mr. M. Suman Kumar, Scientist, ICAR-Indian Veterinary Research Institute, Izatnagar	Adhoc Workshop	Tropical Disease Research Center (TDRC) at Khon Kaen University (KKU), Thailand in partnership with the Southeast Asia One Health University Network (SEAOHUN). The visit will be hosted at Pullman Raja Orchid Hotel and Baan Lawa community in Thailand	31/05/2023 to 02/06/2023	Host Institute	31-05-2023
63	Dr. Hare Krishna, Pr. Scientist, ICAR-Indian Institute of Vegetable Research, Varanasi	Training on the title "International Course on Irrigation and Fertigation Technologies for Sustainable Crop Production"	MATC-MASHAV Agricultural Training Center, Kibbutz Shefayim, Israel	06/06/2023 to 21/06/2023	Expenses on air travel (₹.60,000 only) shall be borne by ICAR-Indian Institute of Vegetable Research, Varanasi and rest of the amount shall be borne by host institute	02-06-2023
64	Dr. M. Pratheepa, Pr. Scientist, ICAR-National Bureau of Agricultural Insect Resources, Karnataka	VII International Symposium on Applications of Modelling as an Innovative Technology in the Horticultural Supply Chain – Model-IT 2023	Leibniz Institute for Agricultural Engineering and Bioeconomy, Max-Eyth-Allee 100, 14469 Potsdam, DE, Potsdam, Germany	11/06/2023 to 14/06/2023	SERB, DST, New Delhi under the ITS (International Travel Support) scheme Other expenditure which involved for stay, food etc. will be spent by applicant herself	08-06-2023

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S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
65	Dr. Anil Kumar Puniya, Pr. Scientist, ICAR- National Dairy Research Institute, Karnal	Satellite workshop on 'Gateway to Global Enteric Methane Reduction'	P&J Live, Rowett Institute, University of Aberdeen, Aberdeen, Scotland, United Kingdom	13/06/2023 to 15/06/2023	Host Institute	09-06-2023
66	Dr. S. Naresh Kumar, Pr. Scientist, ICAR- Indian Agricultural Research Institute, New Delhi	9th Global Workshop of Agricultural Model Intercomparison and Improvement Global Project	Colombia University, New York, USA	26/06/2023 to 30/06/2023	Agricultural Model Intercomparison and Improvement Project (AgMIP), Colombia University, New York, NY	09-06-2023
67	Dr. Kuldeep Kumar Lal, Director, ICAR- Central Institute Brackishwater Aquaculture, Chennai	64th Council Meeting of the Asian Fisheries Society	IPB International Conference Center in Botany Square, Bogor, Indonesia. Host Institute: Department of Fisheries Resources Utilization, Faculty of Marine Sciences and Fisheries, IPB University, Indonesia	25/06/2023 to 29/06/2023	The travel (International and Domestic) and living expenses for his stay in Bogor, Indonesia during his period of deputation will be met by the Asian Fisheries Society Indian Branch (AFSIB), Mangalore, India	09-06-2023
68	Dr. Selvarajan R, Director, ICAR- National Research Centre for Banana, Tamil Nadu	Adhoc Conference on the title "Sensitive and novel diagnostics kits development for banana viruses for ensuring quality banana plants to enhance production in India"	Riga Stradins University, Latvia	15/06/2023 to 17/06/2023	Indian Virological Society, New Delhi	09-06-2023
69	Dr. A.K. Singh, Director, ICAR-Indian Agricultural Research Institute, New Delhi	Visit as Delegation	Start from Frankfurt, Germany and end from Munich, Germany	11/06/2023 to 17/06/2023	IGSP IN-Solar' project	09-06-2023
70	Dr. N. Vijaya Kumari, Pr. Scientist, ICAR- Central Citrus Research Institute, Nagpur	International Symposium on Plant Propagation, Nursery Organization and Management for the Production of Certified Fruit Trees"	The Centre of Research Experimentation and Formation in Agriculture Basile Caramia (CRSFA), Bari, Italy	03/07/2023 to 05/07/2023	applicant	16-06-2023
71	Dr. Kavita Gupta, Pr. Scientist, ICAR- National Bureau of Plant Genetic Resources, New Delhi	Workshop on Pest Risk Assessment (PRA)	National Plant Protection Organization, Dhaka, Bangladesh	17/06/2023 to 20/06/2023	CABI, South Asia	16-06-2023



S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
72	Dr. Gynesh K. Satpute, Pr. Scientist, ICAR-Indian Institute of Soybean Research, Indore	World Soybean Research Conference 11	University of Natural Resources and Life Sciences, Vienna, Austria	18/06/2023 to 23/06/2023	Travel Support grant of SERB, DST Govt. of India for attending the visit. The registration fee, air fare and visa fare will be borne by the SERB, DST, in case he receives the grant from SERB, DST, otherwise the visit will be self-sponsored,	16-06-2023
73	Dr. M. B. Ratnaparkhe, Pr. Scientist, ICAR-Indian Institute of Soybean Research, Indore for attending World Soybean Research Conference	World Soybean Research Conference 11	University of Natural Resources and Life Sciences, Vienna, Austria	18/06/2023 to 23/06/2023	Applicant	16-06-2023
74	Dr. K. Ambasankar, Pr. Scientist, ICAR-Central Institute Brackishwater Aquaculture, Chennai	Aqua feed formulation database workshop	Dhaka, Bangladesh	13/07/2023 to 14/07/2023	US Soybean Export Council South Asia, Chennai India	22-06-2023
75	Dr. S. Subramanian, Pr. scientist, ICAR-Indian Agricultural Research Institute, New Delhi	Technical training workshop	Agriculture & Food Systems Institute (AFSI), USA	26/06/2023 to 30/06/2023	Host institute	22-06-2023
76	Dr. Shyam Narayan Jha, DDG (Agril. Engg.), ICAR Hqrs., New Delhi	Adhoc Conference	Omaha Nebraska, USA, Purdue University, Indiana USA and University of Wisconsin, Madison, USA	04/07/2023 to 12/07/2023	ICAR Hqrs.	26-06-2023
77	Dr. Lakshmi Soujanya Pamidi, Scientist, ICAR-Indian Institute of Maize Research, Ludhiana	5th International Conference on Innovative and current Advances in Agriculture and Allied Sciences	Hotel Howard Johnson by Wyndham Bur, Dubai, Khalid Bin Al Waleed Rd - Al Raffa - Dubai United Arab Emirates	10/07/2023 to 16/07/2023	applicant	27-06-2023
78	Dr. Kunwar Harendra Singh, Director, ICAR-Indian Institute of Soybean Research, Indore	Participate in the Agricultural Biotechnology, Biosafety, Crop Improvement and Technology Transfer Program	Michigan State University East Lansing, USA	05/08/2023 to 18/08/2023	Host institute (The World Technology Access Program (WorldTAP),	27-06-2023
79	Dr. Shyam Narayan Jha, DDG (Agril. Engg.), ICAR Hqrs., New Delhi	Adhoc Conference	Omaha Nebraska, USA, Purdue University, Indiana, USA and University of Wisconsin, Madison, USA	04/07/2023 to 12/07/2023	ICAR (Rs. 10,00,000/- from "Traveling allowance - Foreign TA- ICAR Hqrs.)	26-06-2023

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80	Dr. Gautham Kolluri, Scientist, ICAR-Central Avian Research Institute, Izatnagar	Poultry Science Association Annual Meeting-2023	Poultry Science Association, Fieldstone Road, Champaign, USA	09/07/2023 to 15/07/2023	Travel expenses shall be borne by Foundation for Promotion Poultry Science (\$1000) and visa fees, registration fees and local travel shall be borne by applicant, further any other expenses over and above the travel grant award shall be borne by the applicant himself	28-06-2023
81	Dr. Shobha Joe Kizhakudan, Pr. Scientist, ICAR-Central Marine Fisheries Research Institute, Kerala	Adhoc Workshop	Directorate General of Fisheries Research Ministry of Agriculture, Fisheries Wealth and Water Resources Sultanate of Oman Place - Muscat Oman	03/07/2023 to 17/07/2023	host institute	30-06-2023
82	Dr. Naveen Kumar (Debarred), Scientist, ICAR-National Institute of High Security Animal Diseases, Bhopal	10 <sup>th</sup> International Conference on Bioinformatics and Biomedical Engineering	The Hotel Lopesan Villa Del Conde in Meloneras, Spain	12/07/2023 to 14/07/2023	DST will provide the financial assistance for to and fro economic class air-fare by the shortest route and visa fees for the participation in the aforementioned international conference.	04-07-2023
83	Ms. Preeti Singh, Scientist, ICAR- Indian Agricultural Research Institute, Jharkhand	Training on Soil organic matter stability and microbial community in relation to different plant species in restored soil	Biology Centre CAS - ISBB, Czech Republic	15/07/2023 to 15/10/2023	The International Humic Substance Society (IHSS) Training Award	04-07-2023
84	Dr. Chellapalli Tara Satyavathi, Director, ICAR-Indian Institute of Millets Research, Hyderabad	Attending Curtain raiser event	Nairobi, Kenya	06/07/2023 to 07/07/2023	ICAR from "Traveling allowance - Foreign TA- ICAR Hqrs.	05-07-2023
85	Dr. K.K. Pramanick, Pr. Scientist, ICAR-Indian Agricultural Research Institute, Regional Station, Shimla	Lead Paper Presentation on "Role of bioregulator for the improvement of Temperate Fruit Crops"	Hotel Howard Johnson by Wyndham Bur Dubai, United Arab Emirates	10/07/2023 to 16/07/2023	SSDAT, Meerut, U.P., India, Air Fare (To and Fro)-32000 Registration Fee, Boarding and Lodging Charges-50000 Visa Fee-7000,	07-07-2023
86	Dr. Pradeep Kumar, Sr. Scientist, ICAR-Central Arid Zone Research Institute, Jodhpur	International Conference-Innovations for Sustainable Crop Production in the Mediterranean Region (ISPAMED) 2023	Palermo, Italy	11/07/2023 to 15/07/2023	Organizers of the International conference ISPAMED 2023, University of Palermo, Italy (Host Institute)	07-07-2023

S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
87	Dr. Ashis Kumar Samanta, Head of AN Division, ICAR National Dairy Research Institute, Karnal	Adhoc workshop organized by SAARC Agriculture Centre (SAC) and Welthungerhilfe followed by an exposure visit to a 'Nutrition Smart Community' in Paroha, Rautahat, Nepa	SAARC Agriculture Centre (SAC), Nepal	11/07/2023 to 13/07/2023	The airfare local hospitality including accommodation, food, and logistics support would be provided by Welthungerhilfe	07-07-2023
88	Dr. Dipika Agrahar Murugkar, Pr. Scientist, ICAR-Central Institute of Agricultural Engineering, Bhopa	Adhoc workshop organised by SAARC Agriculture Centre (SAC) and Welthungerhilfe followed by an exposure visit to a 'Nutrition Smart Community' in Paroha, Rautahat, Nepa	SAARC Agriculture Centre (SAC), Nepal	11/07/2023 to 13/07/2023	The airfare local hospitality including accommodation, food, and logistics support would be provided by Welthungerhilfe	07-07-2023
89	Dr. David K.J. Scientist, ICAR-National Bureau of Agricultural Insect Resources, Bengaluru	10th International Congress of Dipterology	Silver Irgacy Resort, Reno, Nevada, USA hosted by North American Dipterists Society United States	16/07/2023 to 22/07/2023	The economy class air fare by the shortest route, airport tax and visa fees will be provided by the funding agency, Department of Science & Technology (DST), SERB, New Delhi. Boarding and Lodging, Registration fee and any other expense shall be borne by the applicant.	10-07-2023
90	Dr. Ankita Gupta, Scientist, ICAR-National Bureau of Agricultural Insect Resources, Bengaluru	10th Congress of International Society of Hymenopterists	Alexandru Ioan Cuza University of Iasi, Romania	24/07/2023 to 29 /07/2023	The economy class air fare by the shortest route, airport tax and visa fees will be provided by the funding agency, Department of Science & Technology (DST), ITS scheme SERB-DST, New Delhi. Boarding and lodging and any other expenses shall be borne by the applicant	10-07-2023
91	Dr. Kaushik Banerjee, Director, ICAR-National Research Centre for Grapes, Pune	2nd Annual Conference of AOAC South East Asia Section	Ho Chi Minh City in Vietnam	01/08/2023 to 02/08/2023	AOAC South East Asia Section	13-07-2023
92	Dr. Kutubuddin Ali Molla, Scientist, ICAR-National Rice Research Institute, Cuttack	Plant Cell Editorial Board Meeting in conjunction with the conference Plant Biology 2023	Savannah, Georgia, USA	05/08/2023 to 09/08/2023	American Society of Plant Biologist (ASPB), MD, USAA, ASPB	21-07-2023



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S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
93	Dr. Kaushik Banerjee, Director, ICAR-National Research Centre for Grapes, Pune	137th AOAC Annual meeting	New Orleans, LA, United States	25/08/2023 to 30/08/2023	AOAC International	21-07-2023
94	Dr. Malkhan Singh Gujar, Scientist, ICAR-Indian Agricultural Research Institute, New Delhi	International Congress of Plant Pathology	French Phytopathological Society & The International Society for Plant Pathology Lyon Convention Centre, France	20/08/2023 to 25/08/2023	The to and fro economic class air-fare by the shortest route, airport tax & visa fees shall be borne by SERB-DST and the accommodation charges, etc. shall be borne by the applicant	28-07-2023
95	Dr. Y.S. Shivay, Pr. Scientist, ICAR-Indian Agricultural Research Institute, New Delhi	4th International Conference on Organic Rice Farming and Production Systems	Tohoku University Graduate School of Agricultural Science, Sendai – Japan	04/09/2023 to 07/09/2023	Applicant himself	07-08-2023
96	Ms. Reema Rani, Scientist, ICAR-Directorate of Rapeseed & Mustard Research, Bharatpur	Conference organised by The American Phytopathological Society (APS)	Sheraton Downtown Hotel, Denver, Colorado, USA	12/08/2023 to 16/08/2023	Science and Engineering Research Board-Department of Science & Technology, Govt of India (SERB-DST (ITS) will provide To and fro economic class air-fare by the shortest route, airport tax & visa fees. The applicant will bear all the other expenses,	09-08-2023
97	Dr. Ram Narayan Singh, Scientist, ICAR-National Institute of Abiotic Stress Management, Baramati	12th International Congress of Plant Pathology	Lyon, France	20/08/2023 to 25/08/2023	The visit is funded by the DST-SERB. Travel and VISA fees will be refunded by SERB after completion of the event as per rules of ITS scheme. Registration fees is waived off by the organizers of the conference. Boarding, lodging, pregame, taxi charges and any other expenses will be borne by the applicant	10-08-2023

S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
98	Dr. Dinesh Kumar Yadav, Scientist, ICAR-Indian Institute of Soil Sciences, Bhopal	12th International Congress of Plant Pathology	Lyon, France	20/08/2023 to 25/08/2023	The visit is funded by the DST-SERB. Travel and VISA fees will be refunded by SERB after completion of the event as per rules of ITS scheme. Registration fees is waived off by the organizers of the conference. Boarding, lodging, pregame, taxi charges and any other expenses will be borne by the applicant	11-08-2023
99	Dr. Celia Chalam V. Head of Division, ICAR-National Bureau of Plant Genetic Resources, New Delh	12th International Congress of Plant Pathology	Lyon, France	20/08/2023 to 25/08/2023	The Organizers have given waiver for registration fee and the Scientist will bear other expenses from personal savings	14-08-2023
100	Dr. Yudh Vir Singh, Pr. Scientist, ICAR-Indian Agricultural Research Institute, New Delhi	4th Intonational Conference on Organic Rice Farming and Production Systems	Tohoku University Graduate School of Agricultural Science, Sendai, Japan	04/09/2023 to 07/09/2023	Host Institute	14-08-2023
101	Dr. Raman Meenakshi Sundaram, Director, ICAR-Indian Institute of Rice Research, Hyderabad	Intonational symposium on Green and Nutritious rice for sustainable agriculture and Human Health	Hua Zhong Agricultural University, Wuhan, China	05/09/2023 to 07/09/2023	The organizers of the Intonational Symposium. Any expenses over and above the support from the organisers will be met by the Applicant	18-08-2023
102	Dr. Satya Nand Sushil, Director, ICAR-National Bureau of Agricultural Insect Resources, Bengaluru	Global Biopesticides Summit-2023 as Expert Panelist	Bishkek Convention Centre, Bishkek, Kyrgyzstan	27/08/2023	Agricultural Microorganism Manufacturers and Farmers Association (AMMA)	17-08-2023
103	Mr. Manoj Kumar, Scientist, ICAR-Central Institute for Research on cotton Technology, Mumbai	International Cotton Advisory Committee (ICAC) - Research Associates Program (RAP) 2023	Washington DC, USA	10/09/2023 to 21/09/2023	ICAC, and the travel expenses borne, as well as visa costs will be covered by the ITS program. Additional. expenses incurred will be entirely borne by the applicant.	17-08-2023
104	Dr. Mohanraj K., Sr. Scientist, ICAR-Sugarcane Breeding Institute, Coimbatore	The 6th Rencontres de Quy Nhon: International Biology Conference 2023	The Intonational Centre for Interdisciplinary Science and Education (ICISE), Quy Nhon, Vietnam	20/09/2023 to 22/09/2023	Travel and accommodation for attending the conference will be borne by the applicant and registration will be covered by the organizers	18-08-2023
105	Dr. Mahesh Chander, Pr. Scientist, ICAR-Indian Veterinary Research Institute, Izatnagar	Xichong Asian Organic Innovation Conference	Nanchung City, Xichong Country, Sichuan Province, China	04/09/2023 to 13/09/2023	Xichong Asian Organic Innovation Conference	25-08-2023

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S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
106	Dr. Smita Sirohi (On Deputation), Pr. Scientist, ICAR Hqrs., New Delhi (posted in Department of Agriculture & Farmer's welfare on roan basis against temporary post of Joint Secretary in G20 Secretariat)	Discussion on ICAE 2024 in their Board Meeting scheduled at the aegis of congress of European Association of Agricultural Economists (EAAE)	Rennes France	29/08/2023 to 01/09/2023	International Association of Agricultural Economists (IAAE)	28-08-2023
107	Dr. Shubhadeep Ghosh, ADG (MF), ICAR Hqrs, New Delh	Sustainable Ocean Initiative (SOI) regional capacity-building workshop for East, South and South-East Asia	The Seoul Olympic Parklet, Seoul, Republic of Korea	05/09/2023 to 08/09/2023	The Secretariat of the Convention of Biological Diversity (CBD), UNEP, Canada	31-08-2023
108	Mr. Rajesh M, Scientist, ICAR-Directorate of Coldwater Fisheries Research, Nainital	Second stage in-person interview for the two years of postdoctoral research fellowship in recirculating aquaculture systems	University of Exeter, UK	05/09/2023 to 08/09/2023	The University of Exeter, UK	01-09-2023
109	Dr. Grinson George, Head of Division, ICAR-Central Marine Fisheries Research Institute, Kochi	Sustainable Ocean Initiative (SOI) regional capacity-building workshop for East, South and South-East Asia	The Seoul Olympic Parklet, Seoul, Republic of Korea	05/09/2023 to 08/09/2023	The Secretariat of the Convention of Biological Diversity (CBD), Canada	01-09-2023
110	Dr. Kaushik Banerjee, Director, ICAR-National Research Centre for Grapes, Pune	ADHOC Workshop	Industrial Technology Institute (ITI), Colombo	18/09/2023 to 27/09/2023	Host Institute	06-09-2023
111	Dr. Om Parkash Yadav, Director, ICAR-Central Arid Zone Research Institute, Jodhpur	Present the accepted paper entitled "Strategies for enhancing productivity and resilience of pearl millet in stress environments of Rajasthan, India	Leibniz Centre for Agricultural Landscape Research (ZALF), Eberswalder Straße Müncheberg, Germany	18/09/2023 to 22/09/2023	Host institute	06-09-2023
112	Dr. Shubhadeep Ghosh, ADG (MF), ICAR Hqrs, New Delhi	Assess the scope and requirement of mariculture Research and Development including financial implications and preparation of a draft project report for the potential Investment in the Fisheries Sector in the Northern province of Sri Lanka's aquaculture and Fisheries Sector	National Aquatic Resources Research and Development Agency, Ministry of Fisheries, Sri Lanka	22/09/2023 to 03/10/2023	ICAR (₹ 1,50,000) from "Traveling allowance - Foreign TA- ICAR Hqrs.)	12-09-2023



S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
113	Dr. Pankaj Kumar Sharma, Joint Director, ICAR-National Institute of Biotic Stress Management, Raipur	16th International Rapeseed Congress	Sydney, Australia	24/09/2023 to 27/09/2023	SERB Travel fellowship award received by the applicant which provide air fare and visa fee, remaining expenses will be borne by himself by the applicant	11-09-2023
114	Dr. R. Manimekalai, Pr. Scientist, ICAR-Sugarcane Breeding Institute, Coimbatore	Adhoc Symposium	Bangladesh Academy Of Sciences National Science & Technology Complex Agargaon, Dhaka	07/10/2023 to 08/10/2023	Bangladesh Academy Of Sciences National Science & Technology Complex Agargaon, Dhaka	11-09-2023
115	Dr. K. Pani Prasad, Pr. Scientist, ICAR-Central Institute on Fisheries Education, Mumbai	Adhoc seminar	Park Inn by Radisson Hotel, Amsterdam, Netherlands at The Netherlands Food and Consumer Product Safety Authority, Ministry of Agriculture, Nature and Food Quality, Netherlands	03/10/2023 to 06/10/2023	The organisers for other expenses the applicant has applied to different organisations/ societies for assistance. All expenses which are not met by any organisation/society will be borne by the applicant	12-09-2023
116	Dr. Praveen Malik, Pr. Scientist, ICAR Hqrs., New Delhi	PVS Evaluation Follow-Up Mission with Rabies-Specific Content in Indonesia" as WOA (OIE) trainee expert	Director General of Livestock and Animal Health Services, Ministry of Agriculture, Jakarta, Indonesia	03/10/2023 to 12/10/2023	World Organization of Animal Health (WOAH)	11-09-2023
117	Dr. Shashank P.R., Scientist, ICAR-Indian Agricultural Research Institute, New Delhi	23rd European Congress of Lepidopterology & 11th Forum Herbulot 2023" on "Conservation, Ecology and Systematics of Lepidoptera in a changing world", Organized by Societas Europaea Lepidopterologica (SEL) and Forum Herbulot	Orleans, France	25/09/2023 to 29/09/2023	DST International Travel Support which provides to and fro economic class air-fare by the shortest route, airport tax & visa fees. Any other expenses over and above the funding provided by DST shall be borne by the applicant	11-09-2023
118	Dr. Sandip Gangil, Pr. Scientist, ICAR-Central Institute of Agricultural Engineering, Bhopal	International Workshop (TARASA23	Siem Reap, Cambodia	24/10/2023 to 27/10/2023	CSAM	12-09-2023
119	Dr. K., Balachandra Hebbar, Director, ICAR-Central Plantation Crops Research Institute, Kasaragod	International Seminar on Carbon Sequestration & Carbon Credit by International Coconut Community	University of Sam Ratulangi, Manado, Indonesia	12/10/2023 to 14/10/2023	International Coconut Community (a UNESCAP inter government Organization)	11-09-2023

## ANNEXURES

S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
120	Dr. G. Byju, Director, ICAR-Central Tuber Crops Research Institute	IFA Crossroads Asia-Pacific Conference 2023	International Fertilizer Association (IFA), Paris, France is host institute. Conference is organised in Bangkok, Thailand	10/10/2023 to 12/10/2023	+9The organisers of the conference	11-09-2023
121	Dr. Ashish Khandelwal, Scientist, ICAR-Indian Agricultural Research Institute, New Delhi	Sardinia 2023 19th International Symposium on waste management, resource recovery and sustainable landfilling  ii Third World Food Forum in WFF Flagship event as Youth Representative under the theme of "Agrifood systems transformation accelerates climate action"	Forte Village Resort, Cagliari, Italy  ii World Food Forum, Rome, Italy	9-13 October 2023, 16-20 October 2023	DBT and CICS and will be applied in SERB-DST, INSA, CSIR and others. If funding not received. It will be borne by the applicant himself	11-09-2023
122	Dr. Shobha Joe Kizhakudan, Pr. Scientist, ICAR-Central Marine Fisheries Research Institute	review Shark and Ray Research Activities and Develop the Rays Diversity and Fisheries Project implemented by the Oman Marine Science & Fisheries Center	Directorate General of Fisheries Research, Ministry of Agriculture, Muscat, Oman	17/09/2023 to 28/09/2023	Government of Oman	15-09-2023
123	Dr. Khapte Pratapsingh Suresh, Scientist, ICAR-National Institute of Abiotic Stress, Baramati	International Plant Phenotyping Symposium – PhenoVeg 2023	World Vegetable Center's Headquarters in Shanhua, Tainan, Taiwan	26/09/2023 to 27/09/2023	DST-SERB through an international travel support scheme	15-09-2023
124	Dr. Ritesh Ranjan, Sr Scientist, ICAR-Central Marine Fisheries Research Institute, Mumbai	Assess the scope and requirement of mariculture Research and Development including financial implications and preparation of a draft project report for the potential Investment in the Fisheries Sector in the Northern province of Sri Lanka's aquaculture and Fisheries Sector	National Aquatic Resources Research and Development Agency, Ministry of Fisheries, Sri Lanka	22/09/2023 to 03/10/2023	ICAR (₹ 1,50,000) from "Traveling allowance - Foreign TA- ICAR Hqrs.)	15-09-2023

S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
125	Dr. Rakesh Chandra Agrawal, DDG (Agri. Edu.), ICAR Headquarters, New Delhi	Training/ Exposure visit to study the extramural research in Agricultural Universities of United State	World Bank Washington DC, USA under NAHEP (National Agricultural Higher Education Project financed by ICAR)	20/09/2023 to 29/09/2023	NAHEP (Travelling expenses-NAHEP for the financial year 2023-24)	15-09-2023
126	Dr. N.C. Gupta, Sr. Scientist, ICAR- National Institute for Plant Biotechnology, New Delhi	16th International Rapeseed Congress organized by Global Council for Innovation in Rapeseed and Canola	Australian Oilseeds Federation Inc, Australia Square, Sydney, Australia	24/09/2023 to 27/09/2023	SERB (Science & Engineering Research Board)/DST will provide to and from economic class air-fare by the shortest route, airport tax & visa fees. ₹ 39,750/- for registration shall be borne by ICAR-NIPB and Local travel, lodging & boarding, medical insurance and all other expenses will be borne by the applicant	19-09-2023
127	Dr. Chellapalli Tara Satyavathi, Director, ICAR-Indian Institute of Millets Research, Hyderabad	Adhoc Seminar on the title "Millets"- How to unlock their potentials to address nutritional, agricultural, and climate challenges	Japan International Research Centre for Agricultural Sciences (JIRCAS), Tsukuba, Ibaraki, Japan	24/09/2023 to 27/09/2023	Japan International Research Centre for Agricultural Sciences (JIRCAS) will cover the cost of attending the meeting, that include international flight tickets and accommodation during the stay	19-09-2023
128	Dr. Bobby Ignatius, Pr. Scientist, ICAR-Central Marine Fisheries Research Institute, Mumbai	Assess the scope and requirement of mariculture Research and Development including financial implications and preparation of a draft project report for the potential Investment in the Fisheries Sector in the Northern province of Sri Lanka's aquaculture and Fisheries Sector	National Aquatic Resources Research and Development Agency, Ministry of Fisheries, Sri Lanka	22/09/2023 to 03/10/2023	ICAR (₹ 1,50,000) from "Traveling allowance - Foreign TA- ICAR Hqrs.)	20-09-2023
129	Dr. R. Asokan, Pr. Scientist, ICAR-Indian Institute of Horticultural Research, Bengaluru	Adhoc conference on the title Entomological Society of America Meeting ESA 2023	National Harbor, Maryland, USA	05/11/2023 to 08/11/2023	DST-SERB-ITS, if not granted, all the expenditure towards attending the conference will be met by the applicant	22-09-2023



## ANNEXURES

S. No	Name and Institute	Visit Purpose	Place	Time Period	Funding	Date of issue
130	Dr. Amala U. Scientist, ICAR-National Bureau of Agricultural Insect Resources, Bengaluru	12th International Symposium on Pollination (ISPXII)	Kirstenbosch Botanic Gardens, Cape Town, South Africa	16/10/2023 to 20/10/2023	DST will provide to and fro economic class air-fare by the shortest route, airport tax & visa fees. Any other expenses over and above the DST funding will be borne by the applicant	22-09-2023
131	Dr. Joykrushna Jena, DDG (Fy.Sci.), ICAR Headquarter, New Delhi	As a member of the delegation led by Dr. L. Murugan, Hon'ble Minister States for Fisheries, Animal Husbandry & Dairying, Government of India	Moscow and Saint Petersburg, Russia	25/09/2023 to 28/09/2023	The expenses on the foreign visit amounting ₹ 4,90,000 shall be borne by the ICAR Hqrs (Foreign TA)	22-09-2023





# APPENDICES



**Subjects allocated to DARE****Part-I**

The following subjects which fall within List I of the Seventh Schedule to the Constitution of India:

1. International cooperation and assistance in the field of agricultural research and education including relations with foreign and international agricultural research and educational institutions and organizations.
2. Fundamental, applied and operational research and higher education including coordination of such research and higher education in agriculture, agro-forestry, animal husbandry, dairying, fisheries, agricultural engineering and horticulture including agricultural statistics, economics and marketing.
3. Coordination and determination of standards in institutions for higher education or research and scientific and technical institutions in so far as they related to food and agriculture including animal husbandry, dairying and fisheries, Development of Human Resources in Agricultural Research/Extensions and Education.
4. Cell for financing to the Indian Council of Agricultural Research and the Commodity Research Programmes other than those relating to tea, coffee and rubber. Sugarcane research.

**Part-II**

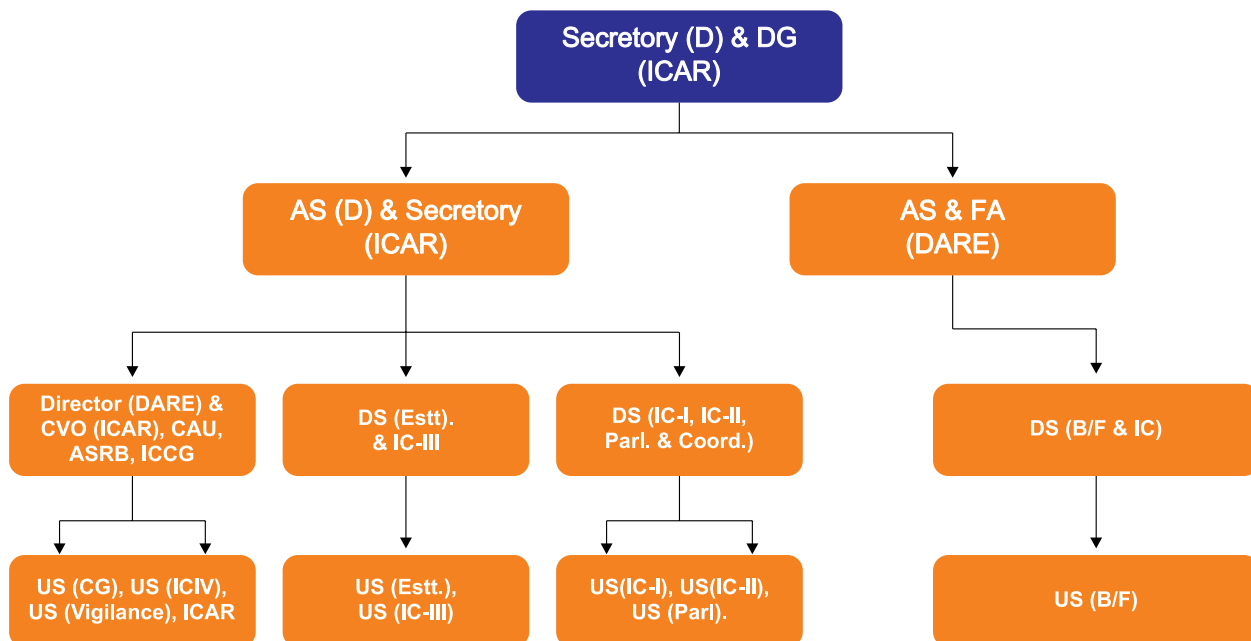
5. For Union Territories the subjects mentioned in Part I above, so far as they exist in regard to these Territories and in addition the following subject which falls within List II of the Seventh Schedule to the Constitution of India.
6. Agricultural Education and Research.

**Part-III**

General and Consequential:

7. Plant, animal and fish introduction and exploration.
8. All India Soil and Land Use Survey relating to research training, correlation, classification, soil mapping and interpretation.
9. Financial assistance to State Governments and Agricultural Universities in respect of agricultural Universities in respect of agricultural research and educational schemes and programmes.
10. National Demonstrations.
11. Indian council of Agricultural Research and its constituent Institutes, National Research Centres, Project Directorates, Bureaux and All India Coordinated Research Projects.
12. Research and Development on production and improvement of bio-fuels plants.

### Organization Chart (DARE Proper)



**Sanctioned Strength and In Position of DARE (Proper) (as on 01.10.2021)****Sanctioned Strength & Men-in-position as on 1.9.2023 in all cadres**

Group	Designation	Sanctioned Strength	Filled up	Vacant
A	Secretary	1	1	0
A	Additional Secretary	1	1	0
A	Additional Secretary & Financial Advisor	1	1	0
A	Director	1	3	-2
A	Deputy Secretary	2	0	2
A	Senior PPS/ Principal Staff Officer	1	0	1
A	Joint Director	1	0	1
A	Under Secretary	7	7	0
A	Principal Private Secretary	3	0	3
A	Assistant Director (Official Language)	1	1	0
B	Private Secretary	2	1	1
B	Section Officer	8	3	5
B	Assistant Section Officer	5	1	4
B	Personal Assistant	4	2	2
B	Senior Hindi Translator	1	1	0
C	UDC-cum-Cashier	1	0	1
C	Senior Secretariat Assistant (UDC)	1	0	1
C	Stenographer Grade D	3	3	0
C	UDC-Hindi Typist	1	0	1
C	Staff Car Driver	1	1	0
C	Junior Secretariat Assistant (LDC)	1	0	1
C	Daftary	1	0	1
C	MTS	5	0	5
	Total	53	26	27

**Names of The Important Functionaries**

S. No.	Name	Designation
1	Dr. Himanshu Pathak	Secretary (DARE)
2.	Sh. Sanjay Garg	Additional Secretary (DARE)
3.	Mrs. Alka Nangia Arora	AS & FA (DARE)
4.	Sh. Shaleen Agrawal	Director
5.	Sh. Khamkhan Pauva Guite	Director
6.	Sh. Rajesh Gupta	Director
7.	Sh. Prem Prakash Maurya	Under Secretary
8.	Sh. Rajesh Kumar	Under Secretary
9.	Sh. Balraj	Under Secretary
10.	Sh. A.G. Subramanian	Under Secretary
11.	Sh. Shailendra Kumar Upadhyay	Under Secretary
12.	Sh. Surajit Saha	Under Secretary
13.	Sh. Anil Singh	Under Secretary



## Budget Allocation: DARE/ICAR

(₹ in Crores)

S. No.	Name of the Scheme	Budget Estimate	Revised Estimate	Budget Estimate
		2022-23	2022-23	2023-24
1	Crop Science	526.08	526.04	714.41
2	Horticulture Science	157.53	157.53	212.00
3	ICAR Hqrs Admn including intellectual Property Rights Management and DKMA	5877.06	6006.28	6384.59
4	Agriculture Extension	243.72	243.72	327.00
5	Agriculture Education	263.77	263.77	322.74
6	Economic Statistics and Management	24.51	24.51	0.00
7	Agricultural Engineering	48.30	48.30	65.00
8	National Fund for Basic, Statistic and Frontier Application Research in Agriculture	35.67	35.67	0.00
9	National Agriculture Higher Education Project	167.18	167.00	92.26
10	Natural Resource Management Institutes Including Agro-Forestry Research	144.90	144.90	240.00
11	Climate Resilient Agriculture Initiative	40.87	40.87	0.00
12	Animal Husbandry	224.41	224.41	300.00
13	Fisheries	118.89	118.89	150.00
	Total ICAR-(A)	7872.89	8001.89	8808.00
14	International Cooperation-Other Programmes	7.03	7.43	7.43
15	Central Agricultural University, Imphal	268.00	270.00	283.42
16	Central Agricultural University, Bundelkhand	126.45	126.45	120.00
17	Central Agricultural University, Bihar	205.00	214.57	248.11
18	National Academy of Agricultural Science and Indian Agricultural Universities Association	1.60	1.1820	0.76
19	Agricultural Scientists Recruitment Board	24.75	29.720	27.98
20	Secretariat	7.90	7.6480	8.30
	Total DARE-(B)	640.73	657.00	696.00
	GRAND TOTAL = (A+B)	8513.62	8658.89	9504.00

## Budget Estimates and Revised Estimates of DARE

(₹ in lakh)

S. No.	Budget Head	Accounting Head	BE 2022-23	RE 2022-23	BE 2023-24
I	<b>DARE-Secretariat</b>				
	Salaries	345100090090001	625.00	645.00	349.00
	Rewards	345100090090005			1.00
	Medical Treatment	345100090090006	15.00	15.00	15.00
	Allowances	345100090090007			320.00
	Leave Travel Concession	345100090090008			10.00
	Training Expenses	345100090090009			3.00
	DTE	345100090090011	25.00	30.00	35.00
	FTE	345100090090012	25.00	25.00	25.00
	Office Expenses	345100090090013	75.00	40.00	38.00
	Printing And Publication	345100090090016			8.00
	Rent for others	345100090090018			1.00
	Digital Equipment	345100090090019			4.00
	OAE	345100090090020	25.00	9.80	0.00
	Material and Supplies	345100090090021			1.00
	Fuel & Lubricants	345100090090024			1.00
	Professional Services	345100090090028			1.60
	Repair & Maintenance	345100090090029			4.00
	Other Revenue Expenditure	345100090090049			1.00
		<b>Total: Secretariat</b>	790.00	764.80	817.60
II	<b>ASRB</b>				
	Secretariat-Economics Services (Major Head)	3451			
	Secretariat-ASRB (Minor Head)	0.091			
	(Sub Head)	20			
	(Object Head)				
	Salaries	1	675.00	559.00	406.00
	Wages	2	0.00		
	Overtime Allowances	3	0.00		
	Rewards	5			1.50
	Medical Treatments	6	10.00	8.00	10.00
	Allowances	7			265.00
	Leave Travel Concession	8			30.00
	Training Expenses	9			1.00
	Domestic Travel Expenses	11	25.00	115.00	175.00
	Foreign Travel Expenses	12	2.00	2.00	7.00
	Office Expenses	13	215.00	350.00	350.50

## APPENDICES

S. No.	Budget Head	Accounting Head	BE 2022-23	RE 2022-23	BE 2023-24
	Rent Rates and Taxes foe Land & Building	14			2.00
	Printing and Publication	16	10.00	10.00	5.00
	Rent for Others	18			60.00
	Digital Equipment	19			5.00
	Other Administrative Expenses	20	100.00	35.00	0.00
	Material and Supplies	21			5.00
	Fuel & Lubricants	24			1.00
	Advertising and Publicity	26	10.00	10.00	7.00
	Minor Civil & Electric Works	27			5.00
	Professional Services	28	10.00	80.00	400.00
	Repair & Maintenance	29			8.00
	Other Revenue Expenditure	49			25.00
	Other Charges	50	463.00	303.00	0.00
	Major Works, Lands and Buildings	53	955.00	1500.00	0.00
	<b>Total</b>		2475.00	2972.00	1769.00
III	<b>Membership Contributions</b>				
	CABI	241580798010032	60.00	60.00	60.00
	CCGIAR	241582798020032	580.00	620.00	620.00
	APPARI	241582798040032	10.00	10.00	10.00
	NACA	241580798050032	48.00	48.00	48.00
	ISTA	241580798070032	5.00	5.00	5.00
	Total: Contribution		703.00	743.00	743.00
IV	<b>Central Agricultural Universities</b>				
1	<b>GIA to Central Agricultural University, Imphal</b>				
01.00.31	Grants-in-Aid General		2500.00	2700.00	2900.00
01.00.35	Grants for Creation of Capital Assets		5500.00	5500.00	6442.00
01.00.36	Grants-in-Aid Salaries		18800.00	18800.00	19000.00
	Total- GIA General to Central Agricultural University.		26800.00	27000.00	28342.00
2	<b>GIA to RLB Central Agricultural University, Bundelkhand (Jhansi)</b>				
02.00.31	Grants-in-Aid General		550.00	850.00	1300.00
02.00.35	Grants for Creation of Capital Assets		10495.00	10195.00	9000.00
02.00.36	Grant-in-Aid Salaries		1600.00	1600.00	1700.00
	Total- GIA to CAU, Bundelkhand, Jhansi		12645.00	12645.00	12000.00
3	<b>GIA to RP Central Agricultural University, Pusa, Bihar</b>				
03.00.31	Grants-in-Aid General		1500.00	1567.00	1700.00

S. No.	Budget Head	Accounting Head	BE 2022-23	RE 2022-23	BE 2023-24
	Grants for Creation of Capital Assets		4500.00	4790.00	5367.00
	Grant-in-Aid Salaries		14500.00	15100.00	17744.00
	Total- GIA to Central Agricultural University, Bihar		20500.00	21457.00	24811.00
	Total Budget: All three Central Agricultural Universities		59945.00	61102.00	65153.00
V	<b>NAAS and IAUA</b>				
05.00.31	Grants-in-Aid General		160.00	118.20	76.40
	Total- GIA to NAAS and IAUA		160.00	118.20	76.40
VI	<b>ASRB</b>				
06.00.31	Grants-in-Aid General		NA	NA	NA
06.00.35	Grants for Creation of Capital Assets		NA	NA	NA
06.00.36	Grant-in-Aid Salaries		NA	NA	NA
	<b>Total- GIA to ASRB</b>				
5475	Capital Outlay on other General Economic Services	<b>5475</b>			
00.001	Direct and Administration (Minor head)	00.001			
01	Secretariat	01			
06	DARE	06			
06.52	Machine and Equipment	06.52			4.00
06.71	Information Computers Telecommunication Equipment	06.71			5.00
06.74	Furniture and Fixtures	06.74			3.00
02	ASRB (Detailed head)	02			<b>12.00</b>
02.51	Motor Vehicles	02.51			-
02.52	Machinery& Equipment	02.52			20.00
02.71	Information Computers Telecommunication Equipment	02.71			80.00
02.72	Building and Structures	02.72			800.00
02.74	Furniture and Fixtures	02.74			119.00
02.77	Other Fixed Assets	02.77			10.00
	GRAND TOTAL:		64073.00	65700.00	69600.00







**Department of Agricultural Research and Education**  
**Ministry of Agriculture and Farmers Welfare**  
**Government of India**