



19.

Partnership and Linkages

The International Cooperation in DARE/ICAR has been operating through Memoranda of Understandings (MoUs)/Work Plans signed between various countries/International organizations and DARE/ICAR as the Nodal Department. DARE/ICAR also acts as the nodal department in the area of agricultural research and education. In addition, Ministry of Science and Technology (DST) has developed programmes of cooperation with various countries and organizations in which DARE/ICAR is also participating in the field of agricultural research and education. The Joint Commissions/Working Groups constituted by the Ministry of External Affairs and Ministry of Commerce also have the component of agricultural research and education in which DARE participates directly or through the Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India.

The activities of the International Cooperation Division are mainly carried out under Memoranda of Understandings (MoUs)/Agreements/Work Plans signed with different International organizations/countries etc.

The Department of Agricultural Research and Education organizes the visits of foreign nationals on their request. DARE also receives the proposals for customized training for the foreign nationals.

Work Plans

- Work Plan between ICAR and International Water Management Institute (IWMI) was signed on 10 June 2014 for furthering scientific and technical cooperation in water management technologies through collaborative research and capacity building.



- Work Plan between ICAR and ICARDA was signed on 3 December 2013 for Collaborative research projects, exchange of scientific literature and information and training programmes in the area of lentil, chickpea, grasspea, barley, faba bean, wheat and pasture development.

- ICAR-Cornell University, USA signed Work Plan on 7 March 2014 in the areas of plant breeding and

plant biotechnology, food processing, educational fellowships (Agri-business management, nano-technology, Library internships) for 2013–2015.

Memoranda of Understandings

- Memorandum of Understanding between ICAR and Royal Botanic Garden, Kew, United Kingdom was signed on 13 February 2014.

- Memorandum of Understanding between ICAR and Global Alliance for Livestock Veterinary Medicine United Kingdom was signed through exchange of letter in March–April 2014.

- Memorandum of Understanding for joining of ICAR and Global Foot-and-Mouth Disease Research Alliance (GFRA) was signed on 3 April 2014 and 16 June 2014 through exchange of letter. Other member countries of GFRA are United Kingdom, Canada, Denmark, France, South Africa, Argentina, Kenya and Belgium.

- Memorandum of Understanding between ICAR and Dhofar University, Oman was signed on 13 June 2014.

- Memorandum of Understanding between ICAR and University of Queensland, Australia was signed on 5 September 2014.

- Memorandum of Understanding between ICAR and Ohio State University, USA was signed through an exchange of letter on 23 October 2014.

Joint Working Group Meetings

- The first Joint Working Group Meeting on Agriculture between India and Suriname was held on 28 July 2014 at NASC, New Delhi to finalize the Work Plan.

- The first Joint Working Group Meeting on Agriculture between India and Mexico was held on 20 October 2014 at NASC, New Delhi to finalize the Work Plan.

Foreign Collaborative Projects with ICAR

DARE has approved following collaborative projects:

- Collaborative project on 'Development of High Performing Fish Strains for Sustainable Aquaculture in Australia and India using State-of-art Techniques' under Indo-Australia collaboration for DBT-DIISR joint Research project received from Central Institute of Freshwater Aquaculture, Bhubaneswar in collaboration with University of Sunshine Coast, Australia.

- Collaborative project 'Oilpalm Germplasm Exchange for R & D between India and Malaysia' was received from Directorate of Oilpalm Research, Pedevagi, Andhra Pradesh. The partners of the project are Directorate of Oilpalm Research, Andhra Pradesh,



and Malaysian Palm Oil Board, Malaysia.

- Collaborative project on 'Regional Network for Skill Exchanges on Dynamic Adaptation of Ruminant Production Systems to a Changing Environment (ArchE_Net)' was received from National Institute of Animal Nutrition and Physiology, Bengaluru. There are seven Indian Ocean Countries, viz. India, Australia, South Africa, Madagascar, Mozambique, France and Union of Comoros which are involved in this collaborative project.

- Collaborative project on 'Development of Resilient Probiotic Foods Designed for the Indian Market Conditions' was received from National Dairy Research Institute (NDRI), Karnal. The partners of the project are NDRI, Karnal and Riddet Institute, Massey University, New Zealand.

- Collaborative project on 'Animal by-product based Aqua Feed for Cost Effective and Sustainable Carp Production' was received from CIFE, Mumbai. The collaborators of the project are CIFE, Mumbai, KAPOSVAR University, Hungary and the Research Institute of Fisheries and Aquaculture, Hungary.

- Collaborative project on 'Improving the Livelihoods of Small holder Cassava Farmers through better access to growth Markets (Cassava G markets)' was received from CTCRI, Thiruvananthapuram, Kerala. The collaborators of the project are CTCRI, Thiruvananthapuram; Natural Resources Institute of University of Greenwich; University of Agriculture, Nigeria; CSIR-FRI, Ghana; Tanzania Food and Nutrition Centre, Tanzania; AII, Uganda, University of Malawi, Malawi and NARI, Tanzania.

- Collaborative project on 'Sustainable Utilization of Agricultural Residues to Generate Energy, Capture Nutrients and Sequester Carbon' was received from Punjab Agricultural University, Ludhiana. The collaborators of the project are PAU, Ludhiana; Purdue University, USA; and University of Nottingham, United Kingdom.

- Collaborative project on 'An evaluation of the current conservation measures on sea cucumber stocks in Palk Bay and Gulf of Mannar' was received from CMFRI, Kochi. Participating countries were Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka and Thailand.

- Collaborative project on 'Participatory management for conservation of seahorses in the Gulf of Mannar, south-east coast of India' was received from CMFRI, Kochi. Project countries under BOBLME are Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka and Thailand.

- Collaborative project on 'Identification of Molecular Basis of Differential Host Response to rapidly Evolving Avian Influenza Viruses in Different Avian Species' was received from IVRI, Izatnagar under the joint call given by DBT and BBSRC on Farmed Animals Disease and Health. The partners of the project are IVRI, Izatnagar and the Roslin Institute, University of Edinburgh, United Kingdom.

- Collaborative project on 'The AgMIP ATLAS

project: Agro-Economic Dynamics and Trade-offs of land use and sustainability' for funding under Belmont Forum and Joint Programming Initiative on Agriculture, Food Security and Land Use Change (FACCE-JPI) International Opportunities Fund with Food Security and Land Use change as the Theme received from IARI, New Delhi.

- The Indo-UK collaborative research project proposal on 'Combining Field Phenotyping and Next Generation Genetics to Uncover Markers, Genes and Biology Underlying Drought Tolerance in Wheat' received from the Directorate of Wheat Research, Karnal and permission for forwarding to Department of Biotechnology, Government of India under the call of BBSRC-DBT Crop Genomics and Technologies. The partners of the project are DWR, Karnal; University of Liverpool, University of Rothamsted and University of Lancaster, United Kingdom.

- Collaborative project on 'Nutrient Delivery System in Crop Plants to Augment Acquisition, Translocation and Utilization Efficiency' was received from IARI, New Delhi for funding from IFDC/VFRC, USA. The collaborators of the project are IARI, New Delhi, Virtual Fertilizer Research Centre/International Fertilizer Development Centre, USA.

- Collaborative research project on 'Indo-Swiss Cassava Network' under Indo-Swiss Collaboration in Biotechnology was received from the CTCRI, Thiruvananthapuram, Kerala. The partners are University of Basel and Eidgenossische Technische Hochschule, Zurich, Switzerland; CTCRI, Thiruvananthapuram; and Madurai Kamaraj University, Madurai.

- Collaborative project on 'Exploring options for enhancing Food Production from the Coastal Environment of India and Australia' received from Central Marine Fisheries Research Institute, Kochi under the DST-DIISR through the Australia-India Strategic Research Fund, Round-8 for forwarding to DST for funding. The partners of the project are CMFRI, Kochi and Tasmanian Aquaculture and Fisheries Research Institute, University of Tasmania, Hobart, Australia.

- Collaborative research project on 'Mining Alleles for Heat Tolerance of Wheat in Australian and Indian Environments' received from Directorate of Wheat Research, Karnal to be submitted under Indo-Australian Biotechnology Fund 2013-14 to the DBT, Ministry of Science & Technology for funding. The partners of the project were DWR, Karnal; PAU, Ludhiana; and University of Adelaide, Australia.

- India-Brazil-South Africa collaborative project proposal on 'Validating Procedures for the measurement of Heat Resistant Spoilage and Pathogenic Bacteria in Milk, to provide a Scientific and technical basis for future development in management of Food Safety in South Africa, India and Brazil' was received from National Dairy Research Institute, Karnal. The project is a part of the India-Brazil-South Africa (IBSA), Trilateral Forum, which is a developmental initiative amongst these countries.

- Collaborative research project on 'Development



of Heat Tolerant Wheat for South Asia' to be implemented at DWR, Karnal in collaboration with Arcadia Biosciences, CIMMYT and USAID.

- Collaborative research project on 'Financing Food Value Chains in Mango and Dairy in two selected states of India' to be implemented by NCAP in collaboration with IFPRI, Washington, USA.

- Collaborative research project on 'Management Strategies for Reducing Energy Consumption and Carbon Emission due to the Groundwater Irrigation in Indo-Gangetic Basin' in collaboration with IVWMI, Sri Lanka; and Water Technology Centre, IARI, Delhi

- Collaborative research project on 'Implementing Agricultural Science and Technology Indicator Data Collection and Policy Analysis in India' to be implemented by NAARM, Hyderabad in collaboration with IFPRI, Washington.

- Collaborative research project on 'Sustainable and Resilient Farming Systems Intensification in the Eastern Gangetic Plains' to be implemented by ICAR-RCER, Patna in collaboration with CIMMYT; BAU, Bihar; and UBKV, West Bengal.

PROGRAMMES OF DARE

Foreign deputation

DARE processed 40 cases of fellowships/scholarships and these were approved by the Competent Authority. Besides DARE has also processed applications for various training programmes abroad under various foreign government, announced by DBT/DST etc., Government of India against open advertisements, United Nations/International Organizations, International Agencies in various fields of agricultural research and

Number of finally selected/approved foreign visit cases pertaining to different fellowships/scholarships/trainings/position of ICAR Scientists

Fellowship/Scholarship/Position/Post	No. of approved cases
Department of Biotechnology fellowships	7
Erasmus Mundus Scholarship	2
INDO-US Research Fellowship Programme	1
Fulbright Fellowship, USIEF-USA	2
DST's Indo-Australia Fellowship	1
Ph.D.-ICAR International Fellowship	2
Netherland Fellowships NFP	3
ICAR Lal Bahadur Shastri Award	2
Other Training Programme abroad	10
Endeavour Fellowship in Australia	7
ICRISAT Position/Post	1
GRIP -SIDA Training Programme	1
INSA Training Programme	1
Total No. of cases	40

education. DARE/ICAR processed applications for various fellowships/scholarships announced by ICAR, Ministry of Human Resource Development, foreign Governments etc. for higher studies/research/Ph.D./Post-Doctoral Research abroad. DARE/ICAR also forwarded applications of the scientists for foreign assignments in other countries and International Organizations. Circulation of vacancies notified by the CGIAR organizations, other International Organizations/Agencies such as Asian Development Bank, World Bank, Commonwealth Secretariat, UNO, FAO etc. was also done by the DARE/ICAR.

Germplasm Exchange

India is one of the 12-mega diverse countries of the world. With only 2.5% of the land area, India already accounts for 7.8% of the global recorded species. India is also rich in traditional and indigenous knowledge both coded and informal.

Biodiversity is a multi-disciplinary subject involving diverse activities and actions. The stakeholders in biological diversity include the Central Government, State Governments, Institutes of local self-governmental organizations, Industries etc. One of the major challenges before India lies in adopting an instrument, which helps to realise the objectives of equitable sharing of benefits enshrined in the 'Convention on Biological Diversity'.

The Department of Agricultural Research and Education, and the ICAR have a rich tradition of exchange of plant genetic resources with several countries. These resources are crucial for enhancing productivity and quality of our crops. No country is self-sufficient in these resources and the future of crop improvement programmes depends on active international cooperation in the area of exchange of genetic resources.

Essentially, the germplasm exchange programme of DARE/ICAR through bilateral MoUs with other countries has been on a *quid pro quo* basis.

The cases of export of germplasm are processed in International Cooperation Division 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 Bureaus/Institutes under ICAR system have been designated by the Ministry of Environment and Forests to act as repositories under the Biological Diversity Act, 2002 for different categories of biological resources:

(a) NBPGR: A centre for exchange of plant germplasm

(b) NBAGR: A centre for exchange of animal germplasm

(c) NBFGR: A centre for exchange of fish germplasm

(d) NBAII: A centre for exchange of germplasm of agriculturally important insects

(e) NBAIM: A centre for exchange of germplasm of agriculturally important micro-organisms

(f) IARI: A centre for exchange of germplasm of algae/fungi.





Cases of germplasm exchange are processed in DARE for approval of the competent authority in consultation with the Bureaus/Institutes/Subject Matter Division.

In the area of exchange of genetic resources, 38 cases received from friendly foreign governments/government sponsored agencies/International Organizations were processed in accordance with the provisions of *Biological Diversity Act, 2002* and further guidelines notified in this regard. Approvals of the Competent Authority in respect of 24 cases were conveyed.

CENTRAL AGRICULTURAL UNIVERSITY

CAU, Imphal

The Central Agricultural University (CAU) Act empowered CAU, Imphal to establish need based Agricultural Education Institutions in the North-Eastern Hills Region of India covering the 6 states (7 campuses) offering 8 under-graduate (UG), 37 post-graduate (Masters) and 12 Ph.D. degree programmes. The intake capacity of all under-graduate programmes is 378 out of which 288 students were admitted and 228 students passed out during 2013–14. The post-graduate (Masters Programme) students intake in College of Agriculture, Imphal (34), College of Veterinary and Animal Husbandry, Aizawl (37), College of Horticulture, Pashighat (9), College of Fisheries, Agartala (7), College of PG Studies, Barapani (36) and College of Agricultural Engineering and Post-harvest Technology, Sikkim (1) offers 37 post-graduate (Masters) programmes with intake capacity of 214 students, 124 students were admitted and 92 students passed out. The intake capacity for 12 PG (Ph.D.) programmes started in the University is 39 for which 21 students were admitted. In Junior Research Fellowship exams conducted by ICAR during 2014–15, 33 students have secured JRF for post-graduate education and CAU ranks second in the country. One hundred and four (104) students from CAU secured admissions in National Institutes, Deemed Universities and SAU's for their post-graduate degree on the basis of their ranking in competitive exams. Thirty-nine (39) faculty members participated in capacity building training programmes and 70 faculty members participated in the International/National Seminars and Workshops. The CAU carried out 73 Intramural Research Projects under University Funded Research Programmes and 113 Externally Funded Research Projects including 23 All India Co-ordinated Research Projects and 6 All India Network Research Projects to address the local problems in agriculture and allied sectors.

Achievements: The major achievements of CAU, Imphal are as follows:

- 'CAU-R2', a promising extra early rice variety for *jhum* fields of Manipur.
- Among the pulses, urdbean variety 'Uttara'; mungbean varieties 'PDM54', 'Pant Mung 6' and 'Pusa Vishal'; field pea variety Rachna; small seeded lentil

variety 'PL-4'; and lathyrus variety 'BIOL-212' (Ratan) were recommended for general cultivation under Manipur hill and valley conditions.

- A new genotype of velvet bean 'CAU-VB1' with morphological character of dwarfness has been developed through mutation breeding.

- Among the oilseeds, soybean variety 'JS 335' and 'RKS 18'; rapeseed variety 'TS-36', yellow sarson variety 'Pitambari' and mustard variety 'NRCHB-101'; and groundnut variety 'Grinar 3' and 'ICGS-76' were recommended for general cultivation under Manipur hill and valley conditions.

- Low-cost Portable Zero Energy Cool Chamber for longer shelf-life of fruits and vegetables was developed.

- Manually operated pineapple harvester was developed. Field capacity (number of fruits harvested) is almost double as compared to the manually harvested with sickle/dao (traditional method).

- A portable type of forced convection solar tunnel low-cost drying technology for some important spices of Manipur were developed.

- Propagation technique for Tamenglong Mandarin was standardized. Wedge grafted and T-budded in May and June has better union with *Citrus jambhiri*, Rangpur lime, and *Kachai* lemon rootstocks.

- The Krishi Vigyan Kendras located at Andro, Imphal East (Manipur), Selesih, Aizawl (Mizoram) and East Siang, Pasighat (Arunachal Pradesh) work for agricultural technology transfer. In the KVK's which comes under CAU, 46 on-campus trainings were organized benefiting 1,284 farmers out of which 636 were women. Trainings (147) were conducted in off-campus mode benefiting 4,186 farmers out of which 1,590 are women. Frontline demonstrations (45) were conducted in the jurisdiction of KVK's of CAU in an area of about 94.35 ha benefiting 325 farmers. The Directorate of Extension Education organized 5 training programmes in four north-eastern states benefiting extension personnel.

Rani Lakshmai Bai Central Agricultural University, Jhansi

Rani Lakshmi Bai Central Agricultural University (possess an area of 300 acres of land pertaining of IGFR, and NRC on Agroforestry at Jhansi) has been earmarked and approval of Government of Uttar Pradesh has been obtained for establishment of University Headquarters and two Colleges of Agriculture, and Horticulture and Forestry.

The Government of Madhya Pradesh has also allocated 125 acre of land for the establishment of College of Veterinary and Animal Sciences at Datia.

B. Sc. (Hons.) Agriculture programme has been started w.e.f. 28 July 2014 for the academic session 2014–15 at Jhansi. The facilities of ICAR Institutes located at Jhansi are being utilized for teaching. Constitution of Board of Management is under process and the academic regulations/guidelines are being prepared.





AGRINNOVATE INDIA LIMITED

To meet its objectives, the AgrInnovate India Limited (AgIn) has undertaken the following activities during 2014–15.

AgrInnovate India Limited (AgIn) has licensed the Tissue Culture Technology of Oilpalm, developed by Directorate of Oilpalm Research (DoPR), Pedavegi, in partnership with Biotech Consortium India Limited. During the period under report, the Palm Tissue Culture Technology was licensed to other three private partners, on a non-exclusive basis. AgIn through its technical partner, DoPR is providing hand holding and training to the technical personnel.

AgIn has finalized technology licensing agreement with a private firm for '3AB3 and 3ABC Non-structural protein based diagnostic assay (ELISA) that can differentiate infected from vaccinated animals (DIVA)'. The technology was developed at Project Directorate on Foot-and-Mouth Disease, Mukteshwar. Besides AgIn has also identified some potential Agriculture Engineering Technologies and is working towards their commercialization.

Further, enquiries for licensing of technologies were addressed including licensing of wheat varieties from Directorate of Wheat Research; Bottled sugarcane juice from Tamil Nadu Agricultural University; Intermediate moisture chicken from Central Institute of Avian Research, Izatnagar; and Bt Cotton detection kits from Central Institute of Cotton Research, Nagpur.

Entrepreneurship development programmes

An Entrepreneurship Development Programme was conducted for 15 veterans (ex-servicemen) who are looking for Agri-Business opportunities for entrepreneurial initiatives that can be taken up in the villages. Protected Cultivation Technology was chosen as a suitable technology for transfer by veterans to their villages considering the growing of high-priced vegetables in extreme weather conditions of north India.

Capacity building activities

AgrInnovate conducted various capacity building programmes which included, short-term training on Chick Vent Sexing and Seed Quality Assurance sponsored by West Africa Agricultural Productivity Programme.

Three training-cum-workshops were conducted under ASEAN-India Cooperation Fund on 'Conventional and Molecular Techniques for Diagnosis of Trans-boundary Animal Diseases'; 'IT Application for Agricultural Extension (e-Extension)' and 'Organizing and Implementing an Effective National Seed Quality Control System'.

Customized training programmes, sponsored by ICARDA were conducted for 16 participants from Iraq on Biofertilizer and Biopesticides and Bioorganic Fertilization; Insect Biological Control (Mass rearing) of Agriculture Pests; and Training on Seed Technology



Dr S Ayyappan (Secretary, DARE and Director General, ICAR) inaugurated the newly renovated corporate office of AgrInnovate India on 15 October 2014.

and Pesticide testing. Two participants from Mongolia, attended FAO sponsored training on Pesticide Testing.

Contract research

The AgrInnovate India decided to take up the establishment of facility for production of Foot-and-Mouth Disease Vaccine in PPP mode. Besides, new proposals like setting up Biodiesel Plant, development of DIVA kits for detection of Foot-and-Mouth Disease were initiated during the period.

Consultancies

A project for preparation of feasibility report on 'Establishment of Tractor Assembling Plant and Farm Equipment Manufacturing Unit' at Tanzania was taken up in collaboration with technical expert team from the Central Institute of Agricultural Engineering, Bhopal.

CONSULTANCIES

- Dr Indu Sharma (Project Director, Directorate of Wheat Research, Karnal) and Dr M. S. Saharan (Principal Scientist, Plant Pathology, DWR, Karnal) visited Kabul, Afghanistan for international consultancy for research on Karnal Bunt for 15 days as an International Phytopathologist (Karnal Bunt Expert) under World Bank Funded Project of Afghanistan Agricultural Inputs Project.

- Dr (Mrs) R. Manimekalai (Senior Scientist, Central Plantation Crop Research Institute, Kasaragod) visited Sri Lanka for working with the scientists of Coconut Research Institute, Sri Lanka.

- Dr U.C. Sud (Director IASRI, New Delhi) conducted training on Sampling and Research Methodologies for statistical personnel from government agencies and private consultant in National Statistics Bureau (NSB), Bhutan from 3 to 14 March 2014 as a Consultant/Expert under the UNICEF funding. Dr Sud also provided consultancy services to Bangladesh Bureau of Statistics, Bangladesh in identifying and implementing a harmonized Crop-Cutting Experiments/Methodology.

- Dr S. Sriram (Principal Scientist, IIHR, Bengaluru) attended the 'Australian Vegetable Soil-Borne Diseases Diagnostics Workshop' at Melbourne, Australia





(organized by Horticulture Australia Limited) from 16 to 17 June 2014.

- Dr K. Banerjee (Principal Scientist and ICAR National Fellow, NRCG, Pune) visited Malaysia as member of the Programme Advisory Committee - Food Nutrition and Quality Sub-Committee of the Malaysian Palm Oil Board, Ministry of Plantation Industries and Commodities, from 1 January 2014 to 31 December 2016.

- Dr Arjava Sharma (Director, NBAGR, Karnal) participated as Expert Lecturer to impart training to the International participants of IAEA-sponsored Regional Training Course on Genetic Characterization of Indigenous Livestock Breeds using DNA Markers, Seibersdorf, Austria from 11 to 13 August 2014 and also visited IAEA Agriculture and Biotechnology Laboratories and IAEA (Headquarters) along with other lecturers from 14 to 15 August 2014.

- Dr P. Routray (Principal Scientist, CIFA, Bhubaneswar) provided consultancy services/technical assistance to DEVTEC Nepal Pvt. Ltd., Nepal in the field of 'Fish Seed Production and Hatchery Management' as an Expert from 1 to 30 September 2014.

- Dr Ram Asrey (Principal Scientist, IARI, New Delhi) delivered a lecture on 'Post-harvest Management and Marketing of Horticultural Crops' as an Expert for the participants of the International Training Programme at Kyungpook National University, Daegu, Republic of Korea from 27 to 30 October 2014.

INTERNATIONAL CONFERENCES, SEMINARS, SYMPOSIA

- International Conference on 'Extension Educational Strategies for Sustainable Agricultural Development – A Global Perspective' was held from 5 to 8 December 2013 at University of Agricultural Sciences, Bengaluru.

- International Conference on 'Agrarian Issues' was held from 9 to 12 January 2014 at Kerala Institute of Local Administration, Thrissur, Kerala.

- Indo-US International Congress-cum-Workshop on 'IPR 2014' was held from 29 to 31 January 2014 at Amity University Campus, NOIDA (Uttar Pradesh).

- 'The use of molecular epidemiology and functional genomics to underpin the development of novel interventions to combat bovine *Staphylococcus aureus* mastitis in India' was held at NIVEDI, Hebbal, Bengaluru on 1 to 3 February 2014.

- International Conference on 'Natural Resource Management for Food Security and Rural Livelihoods' was held from 10 to 13 February 2014 at NASC Complex, New Delhi.

- AZRA (Applied Zoologists Research Association) Silver Jubilee International Conference on 'Probing Biosciences for Food Security and Environmental Safety' was held from 16 to 18 February 2014 at Central Rice Research Institute, Cuttack.

- Global Animal Nutrition Conference 'Glance 2014' was held at Bengaluru from 20 to 22 April 2014.

- International Symposium on 'Jackfruit (*Artocarpus heterophyllus*) and Bread Fruit (*Artocarpus altilis* Frosbarg) of the Tropics-Genetic Diversity, Management, Value Addition and Marketing Strategies' was held at the University of Agricultural Sciences, Bengaluru from 15 to 16 May 2014.

- International Symposium on 'Plantation Crops (PLACROSYM-XXI)' was held at Indian Institute of Spices Research, Kozhikode, Kerala from 10 to 12 December 2014.

- International Conclave on 'Sugar Crops and Sugar Fest 2014 on Sweeteners and Green Energy from Sugar Crops: Emerging Technologies', was held from 15 to 17 February 2014 at Indian Institute of Sugarcane Research, Lucknow.

- Global Conference on 'Technological Challenges and Human Resources for Climate Smart Horticulture – Issues and Strategies' was held from 28 to 31 May 2014 at Navsari Agricultural University, Navsari.

- Asian Solanaceous Round Table Meeting was held at Indian Institute of Horticultural Research, Bengaluru was held from 9 to 10 September 2014.

- Asia Pacific Regional Consultation on 'Role of Family Farming in the 21st Century. Achieving the Zero Hunger Challenge by 2025' was held from 7 to 10 August 2014 at M. S. Swaminathan Research Foundation, Chennai.

- International Conference on 'Changing Scenario of Pest Problems in Agri-Horti Eco-System and their Management' was held at Rajasthan College of Agriculture, Maharana Pratap University of Agriculture and Technology, Udaipur from 27 to 29 November 2014.

- International Conference on 'Technological Interventions in Agricultural Sciences for Enhanced Productivity, Nutritional Quality and Value Addition (TIAS-2014)' was held at Nagaland University, SASRD, Medziphema Campus, Nagaland from 11 to 13 November 2014.

- International Conference on 'Together for Nutrition 2014: Working across sectors to Improve Nutrition in India' was held from 29 to 30 October 2014 at NASC Complex, Pusa, New Delhi.

- International Symposium on 'New Dimensions in Agro-Meteorology for Sustainable Agriculture (NASA-2014)' was held at Pantnagar from 16 to 18 October 2014.

PROTOCOL ACTIVITIES

VIP delegations

- His Excellency Dr Ali Mohamed Shein (President of Zanzibar and Chairman of the Revolutionary Council) and Mrs Mwanamwema Shein visited Indian Agricultural Research Institute, New Delhi on 4 February 2014.

- His Excellency Mr Per Halholt (Executive Vice President, Novozymes, Denmark) visited Indian Agricultural Research Institute, New Delhi on 29 November 2013.





- Hon'ble Dr H.R. Tayebi (Deputy Minister and President, Academic Center for Education, Culture and Research Iran) visited Indian Agricultural Research Institute, New Delhi.

- Hon'ble Minister of Agriculture Mechanization and Irrigation Development, Republic of Zimbabwe, Mr Joseph Made, visited Indian Agricultural Research Institute on 5 February 2014.

- Hon'ble Minister of Animal Resources, Republic of the Sudan, Dr Faisal Hassan Ibrahim, and Dr Ahmed Ibrahim Adam visited Central Sheep and Wool Research Institute, Avikanagar on 6 March 2014.

- Hon'ble Minister of Agriculture and Forests, Royal Government of Bhutan, Mr Lyonpo Yeshey Dorji, visited Indian Council Agricultural Research on 5 August 2014.

- Mr Pak Kyong Song (Ambassador, Embassy of DPR Korea) visited Indian Agricultural Research Institute, New Delhi on 15 November 2013.

Visits of Secretary (DARE) and DG (ICAR)

- Dr S. Ayyappan (Secretary, DARE and DG, ICAR) attended 10th Fund-Council Meeting (FC-10) held in Nairobi, Kenya from 5 to 8 November 2013.

- Dr S. Ayyappan (Secretary, DARE and DG, ICAR) attended the Board of Trustees Meeting of International Center for Agricultural Research in the Dry Areas

(ICARDA) at Baku, Azerbaijan from 29 November to 4 December 2013.

- Dr S. Ayyappan (Secretary, DARE and DG, ICAR) participated in the Board of Trustees Meeting of International Rice Research Institute at Los Banos, Laguna, Philippines from 14 to 16 April 2014.

- Dr S. Ayyappan (Secretary, DARE and DG, ICAR) participated in the Board of Trustees Meeting of International Centre for Agricultural Research in the Dry Areas at Beirut, Lebanon from 4 to 9 May 2014.

- Dr S. Ayyappan (Secretary, DARE and DG, ICAR) participated in 55th ICARDA Board of Trustees Meeting held in Cairo, Egypt from 11 to 14 October 2014.

Visits of Additional Secretary (DARE) and Secretary (ICAR)

- Shri Arvind R. Kaushal (Additional Secretary, DARE and Secretary, ICAR) and Shri Rajesh Ranjan (Director, DARE) attended the Borlaug Summit on 'Wheat for Food Security' at Obregon, Mexico from 25 to 28 March 2014.

- Shri Arvind R. Kaushal (Additional Secretary, DARE and Secretary, ICAR) attended FC-11 Meeting of Fund Council from 6 to 9 May 2014 and training programme on 'Agricultural Education Management and Leadership' under the World Bank funded NAIP project held at Ithaca, New York, USA from 10 to 18 May 2014.

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