ANNUAL REPORT

(DARE)

2020-21

सत्यमेव जयते

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

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FOREWORD

Agriculture is the primary source of livelihood for more than 50% of India's population. Present Government's target is to achieve the ambitious goal of doubling farm income by 2022. Towards this target, government. has increased investment in agricultural infrastructure such as irrigation facilities, warehousing and cold storage. Towards these basic goals, DARE coordinates and promotes Agricultural Research & Education in the country through it's autonomous bodies, viz ICAR, Central Agricultural University (CAU), Imphal, Dr. Rajendra Prasad Central Agricultural University (DRPCAU), Pusa, Bihar and Rani Lakshmi Bai Central Agricultural University (RLBCAU), Jhansi, U.P.

ICAR with 113 institutes spread across the country, is one of the largest national agricultural research systems in the world. Recently, Hon'ble Prime Minister of India reviewed the activities of ICAR. He appreciated the efforts of ICAR towards developing varieties, focusing on specific requirements of agro-climatic zones and exhorted the need for developing forward and backward linkages to assure better returns to farmers. He highlighted the need to adopt organic and natural farming practices on a cluster based approach. He directed that starts-ups and agri-entrepreneurs need to be promoted to ensure innovation and use of technology in agriculture and allied sectors and the need to leverage information technology to provide information on demand to the farmers.

In addition to the above, he directed that Hackathons may be organized twice a year to solve identified problems and meet design needs for tools and equipment. He also highlighted the need for research on indigenous breeds of dogs and horses. He directed that a focused mission mode approach be adopted for vaccination drives for Foot and Mouth disease. He directed that ease of access to farm equipment and transport facility from field to markets will be ensured.

There are 3 Central Agricultural Universities in the country for Agricultural Research and Education and extension activities. CAU, Imphal is the oldest fully residential University established in the year 1993 and is having 13 constituent colleges covering North East Hill States under its jurisdiction except Assam. It has developed 86 farmer friendly technologies and 380 location specific recommendations for adoption by the farmers and agri-preneurs of NEH Region. It also released 3 varieties of rice, viz CAU-R2 (Tomthinphon), CAU-R3 (Mangalphon) and CAU-R4 (Enotphon) and notified in the Gazette. It also signed MoUs with reputed institutes for cooperative relationship through mutual assistance in the areas of education, research and extension activities.

DRPCAU, Pusa came into existence on 7th Oct, 2016. Hon'ble PM of India Shri Narendra Modi Ji inaugurated it's new building of "School of Agribusiness and Rural management" and also laid the foundation stone of new facilities – hostels, International Guest house, etc on 10th Sept 2020. This University has been placed under top 10 best among Government Universities of the country by India Today – MDRA Survey 2020. It became the first Agricultural University in India ranked under top 10 till date. It also got 5th spot in best Student – Teacher ratio. This University has recently developed a rice variety- Rajendra Saraswati, a maize variety- Rajendra Hybrid Makka-4 and a sugarcane variety Rajendra Ganna-1. During the year 2020, farming community was trained in the area of mushroom production, honey bee, vermi-composting, production technology of different crops, etc.

RLBCAU, Jhansi released its first ever RLB Chana- Kabuli (RLBGK-1) variety which is resistant/moderately resistant to *Fusarium* wilt, dry root rot, collar rot and stunt. A set of 82 indigenous wheat germplasm lines, released varieties and genetic stocks were also evaluated for different agro-morphological characters and biotic stresses. Towards infrastructure development of the University, Hon'ble PM dedicated the newly constructed Academic and Administrative building to the nation on Aug 29th, 2020. Hon'ble PM during interaction with students stressed on promoting recycling of water and rain-water harvesting through innovative and less costly technology in the region. In addition to the above, foundation stone was laid on 27th Sept, 2020 for college of Veterinary & Animal Science and College of Fisheries at Datia Campus of the University.

In the international cooperation field, the first India – Vietnam Joint Working Group on Agriculture between M/o Agriculture & Rural Development of Vietnam and M/o Agriculture & FW of India was held at Hanoi, Vietnam from 18-21 Nov, 2019 in coordination with DARE & MEA. International seminar on Climate smart farming systems for BIMSTEC member states was held during 11-13 Dec, 2019 in New Delhi. BIMSTEC delegation was delighted to witness the role of IARI and also the agri-tech progress in India. An MoU was signed on 23rd December 2019 between ICAR, New Delhi and Hawassa University, Ethiopia for cooperation in agricultural research and education. An MoU was signed on 24th Jan 2020 between ICAR, New Delhi and the Heinrich Heine University, Dusseldorf, Germany for introducing Genome Edited Traits for Bacterial Blight Resistance into Indian rice varieties. An MoU was also signed on 13th May 2020 between ICAR, New Delhi and Donald Danforth Plant Science Centre, Saint Louis, USA for cooperation in agricultural research and product developement. The 6th ASEAN India-Ministerial Meeting on Agriculture and Foresting was held during 20-21 October 2020 at Combodia in virtual form. Shri Kailash Choudhary, MoS participated from the Indian side.

Perusal of the above shows that in spite of Covid-19 Pandemic in 2020, significant developmental initiatives have been taken by DARE/ICAR in the field of agricultural research and technology development for Indian farmers. Till previous year, Annual Report of DARE & ICAR used to be published together. From this year, with a view to give proper and wide publicity of government efforts towards agricultural research and for the benefit of farmers, separate Annual Reports of DARE & ICAR are being published. I hope it will be useful for all concerned with Agricultural Research and Education in India.

(Narendra Singh Tomar)
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 in the country.

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 and education in agriculture including horticulture, fisheries and animal sciences in the entire country. It has the following four autonomous bodies under its administrative control:

i. Indian Council of Agricultural Research (ICAR);
ii. Central Agricultural University (CAU), Imphal;
iii. Dr Rajendra Prasad Central Agricultural University, Pusa, Bihar;
iv. Rani Laxmi Bai Central Agricultural University, Jhansi, UP.

Besides this, it has Agricultural Scientists Recruitment Board (ASRB) as Attached Office and Agrinnovate India Ltd. (AgIn), a Government of India enterprise under its' control.

Indian Council of Agricultural Research (ICAR)

The Indian Council of Agricultural Research is an autonomous organization under the Department of Agricultural Research and Education, Ministry of Agriculture and Farmers Welfare, Government of India. Formerly known as the Imperial Council of Agricultural Research, it was established on 16 July 1929 as a registered society under the Societies Registration Act, 1860 on the recommendations of the Royal Commission of Agriculture. It was reorganized in 1965 and again in 1973, with its Headquarters located in Krishi Bhawan, New Delhi, with support facilities in Krishi Anusandhan Bhawan 1 and 2 and NASC Complex, Pusa, New Delhi. The Union Minister of Agriculture and Farmers Welfare is the President of ICAR. The Principal Executive Officer of the ICAR is the Director General, who also functions as Secretary, Department of Agriculture Research and Education, Government of India. The General Body of the ICAR Society, headed by the Union Minister of Agriculture and Farmers Welfare is the supreme authority of the ICAR. Its members include; Ministers for Agriculture, Animal Husbandry and Fisheries, and the senior officers of the various state governments, Members of Parliaments and the representatives from industry, research institutes, scientific organizations and farming community. The Governing Body headed by the community Director General, who is also the Secretary, DARE is the chief executive and decision making authority of the ICAR. The Governing Body consists of eminent agricultural scientists, educationist, public representatives and representatives of the farmers. It is assisted by the Accreditation Board, Regional Committees, Policy and Planning Committee, several Scientific Panels and Publications Committee. In scientific matters, the Director General is assisted by 8 Deputy Directors General, one each in (i) Crop Science, (ii) Horticulture Science, (iii) Natural Resource Management, (iv) Animal Science, (v) Agricultural Engineering, (vi) Fisheries Science, (vii) Agricultural Education, and (viii) Agricultural Extension, who are also assisted by Assistant Directors General, and are the Heads of their Subject Matter Division (SMDs) for the entire country. SMDs are responsible for extending all technical and financial guidance and support to the research Institutes, National Research Centres and the Project Directorates within their respective Divisions. In addition, Assistant Directors General of National Agricultural Science Fund (NASF), Coordination, Plan Implementation and Monitoring, Intellectual Relations and Human Resource Management also assist the Director General in their respective job roles.

The Indian Council of Agricultural Research (ICAR) is an apex organization mandated to promote agricultural research for creation of useful knowledge, develop appropriate technologies and provide quality education in the country. The ICAR is undertaking fundamental and applied research in the traditional and frontier areas of agriculture, horticulture, animal production, fisheries and allied sciences to offer practical solution to agriculture related problems. It offers solution for conservation and sustainable management of natural resources, enhancing productivity of crops, vegetables, livestock, poultry and fisheries etc. The research for development of agriculture is undertaken through 113 institutes including 72 Research Institutes, 6 National Bureaux, 23 Project Directorates and Agricultural Technology Application Research Institutes, 12 National Research Centres, 82 All

India Coordinated Research Projects + Network Research Projects. The Directorate of Knowledge Management in Agriculture (DKMA) functions as communication arm of the ICAR responsible for delivery of information/knowledge generated by the network of the ICAR and its institutions; and addresses mandate of ICAR through Publications, Information, ICT, Public Relations Unit and CeRA. The ICAR promotes research, education and frontline extension activities in 74 Agricultural Universities, which include 63 State Agricultural Universities, 4 Deemed Universities, 3 Central Agricultural Universities, and 4 Central Universities with agricultural faculty by giving financial assistance in different forms.

With 722 Krishi Vigyan Kendras (Farm Science Centers) located at most districts of the country, the ICAR Organizes regular training and demonstrations in the area of front line extension so as to transfer latest agricultural technologies for enhancing the capacity of the farmers, State development officers, entrepreneurs and other stakeholders for wide adoption of technologies.

Central Agricultural University (CAU) Imphal

During the year in Central Agricultural University (CAU), Imphal a total of 506, 183 and 38 students including 13 foreign students were admitted in various Under-graduates, Masters and Ph.D programmes, respectively during the academic year 2020-21. A total of 328 UG and 140 PG students completed their degrees and 21 students were also awarded Ph.Ds during this period.

Dr Rajendra Prasad Central Agricultural University (DRPCAU), Pusa, Bihar

Dr Rajendra Prasad Central Agricultural University, which came into existence 7th October 2016 after conversion of Rajendra Agricultural University into a Central University, has made outstanding progress over the short span of 4-years to accomplish its vision of Advancing professional competency for pursuing excellence in education, research and entrepreneurship in relation to agriculture and allied sectors with ethical values to meet the regional, national and global needs and offering specialized services to the farmers for decent livelihood.

The Hon'ble Prime Minister of India Shri Narendra Modi ji has inaugurated the new building of "School of Agribusiness & Rural management" and also laid the foundation stone of new facilities – hostels, International Guest house etc. on 10thSeptember 2020. A Center for Start-up Facilitation was inaugurated by Shri Giriraj Singhji, the Minister of Animal Husbandry, Dairying and Fisheries during the Kissan Mela, 2020. Incubation agreement between Center for Start-up Facilitation, RPCAU, Pusa and the Adventure Organic Farms Private Limited, Patna was executed on July 09, 2020, for the commercialisation of products viz., honey, mushroom products, jaggery and herbal gulal. This is a giant leap of the university from 'Research and innovation' to the present need for entrepreneurship.

Rani Laxmi Bai Central Agricultural University (RLBCAU), Jhansi, UP

The Rani Lakshmi Bai Central Agricultural University, Jhansi made sustained strides towards achieving its mandated objectives and goals in the field of agricultural education, research and extension as an institution of national importance. A significant headway was made to complete the on-going construction of Academic Building for College of Agriculture, Horticulture and Forestry, Administrative building, VC residence, Hostels and few faculty residences at Jhansi.

Shri Narendra Modi ji, Hon'ble Prime Minister of India dedicated the newly constructed Academic and Administrative buildings virtually to the nation on August 29, 2020. Sri Narendra Singh Tomar ji, Hon'ble Minister of Agriculture and Farmers Welfare, Government of India laid the foundation of College of Veterinary& Animal Science and College of Fisheries at Datia campus of Rani Lakshmi Bai Central Agricultural University, Jhansi on September 27, 2020.

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 Board as per their decision in the meeting of the Union Cabinet held on 1 August, 2018 and issued vide Notification No. 25/CM/2018(i) dated 06.08.2018; Case No.213/25/2018 (Item-7). The decision has been formally notified in the GOI Gazette on 9 August, 2018.

During the year, recruitment process for twenty six posts has been completed, comprising of three Deputy Directors General, five Directors of National Institutes, five Assistant Directors General and thirteen Directors of ICAR Institutes. For easy retrieval of the NET certificates which were earlier issued in printed form, Board has initiated digitization of NET certificates of NET Examination-2018 (I & II) awards. Now, NET certificate from the exam NET 2018 onwards, can be downloaded through DIGILOCKER app of MeitY, Government of India. ASRB has gradually shifted from Conventional pen and paper examination to on-line computer based tests. During the year, Board has conducted successfully one National Eligibility Examinations-2019. In this examination a total of 46,353 candidates had registered.

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 19th October, 2011 and owned by Department of Agricultural Research & Education (DARE), Ministry of Agriculture, Government of India. The Company has successfully been able to turn a new leaf in the recent past by initiating effective partnerships with ICAR institutes and private companies.

The company's revenue from operations touched Rs. 1,53,76,950/- for the first time in nearly a decade, as against Rs. 30,57,630 during the previous Financial Year (2018-19). Accordingly, the company's net profit stood at Rs. 2,80,89,362 as against Rs. 2,36,63,549/- since the last Financial Year 2018-19. With a revamped website and increased efforts at bringing over 35 ICAR institute developed technologies under AgIn's purview, nearly 340 technologies have been added for the list of technologies ready for commercialization through Agrinnovate.

DARE has also given permission for signing of the following MoUs/Work plans:

a. An MoU between Indian Council of Agricultural Research and Hawassa University, Ethiopia

b. A Memorandum of Understanding has been signed on 23rd December, 2019 between Indian Council of Agricultural Research (ICAR), New Delhi, and Hawassa University, Hawassa, Ethiopia for Cooperation in Agricultural Research and Education.

c. A Memorandum of Understanding has been signed on 24th January, 2020 between Indian Council of Agricultural Research (ICAR), New Delhi, and Heinrich Heine University (HHU), Dusseldorf, Germany for Introducing Genome Edited Traits for Bacterial Blight Resistance into Indian Rice varieties.

d. MoU between Indian Council of Agricultural Research (ICAR), New Delhi, and the Donald Danforth Plant Science Center (DDPSC), Saint Louis, USA

e. A Memorandum of Understanding has been signed on 13th May, 2020 between Indian Council of Agricultural Research (ICAR), New Delhi, India and Donald Danforth Plant Science Center (DDPSC), Saint Louis, USA for cooperation in Agricultural Research and Product Development.

f. MoU between Indian Council of Agricultural Research (ICAR), New Delhi, India and Asia-Pacific Association of Agricultural Research Institutions (APAARI), Bangkok, Thailand

g. A Memorandum of Understanding has been signed on 23rd October, 2020 between Indian Council of Agricultural Research (ICAR), New Delhi, India and Asia- Pacific Association of Agricultural Research Institutions (APAARI), Bangkok, Thailand for cooperation in Agricultural Research and Education.

h. A Work Plan for the period 2020-2021 has been signed on 04.12.2019 between Indian Council of Agricultural Research (ICAR), and The International Fertilizer Development center (IFDC), Alabama USA.

i. A Work Plan for the period 2020-2021 has been signed on 13.02.2020 between Indian Council of Agricultural Research (ICAR), an autonomous body under the aegis of DARE and The Agricultural Research Council, Pretoria, South Africa.

Further, under Indo-ASEAN Research Collaboration, Shri. Kailash Choudhary Ji, Hon'ble Minister of State for Ministry of Agriculture Cooperation and Farmers' Welfare has represented India in the 6th ASEAN-India Ministerial Meeting on Agriculture and Forestry (AIMMAF) which was held virtually during 20-21 October, 2020, at Cambodia.

India is also a donor member country to 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. 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.

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 achieve the production of food grains four times, horticultural crops six times, fish nine times and eggs twenty-seven times since 1951. This enabled the nation not only to be food and nutrition secure but also improved livelihood of the farmers.

(TRILOCHAN MOHAPATRA)
Secretary, Department of Agricultural Research &
Education and Director General,
Indian Council of Agricultural Research.

02

BODIES UNDER DARE AND THEIR ACTIVITIES

Central Agricultural University (CAU), Imphal, Manipur

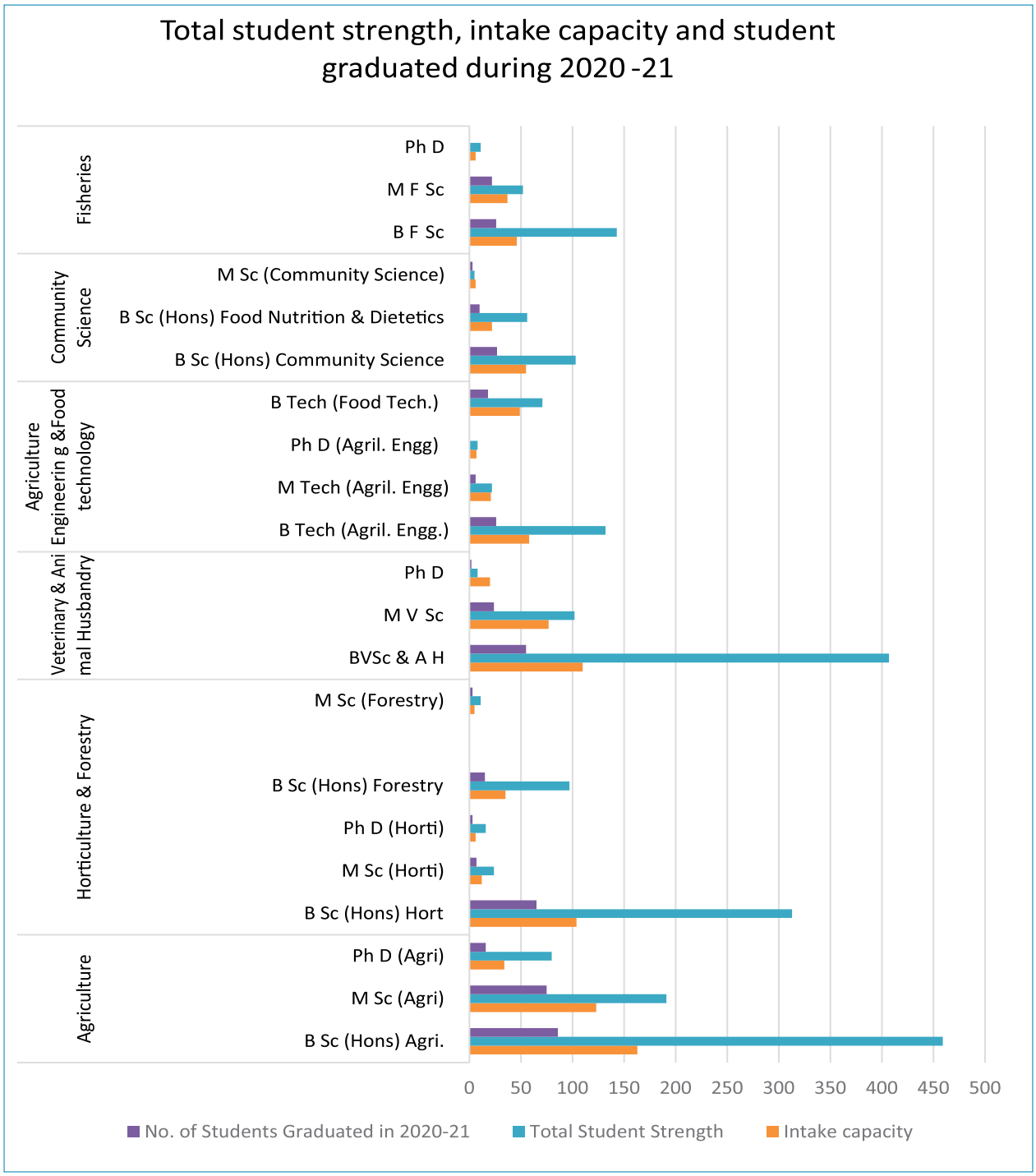
Central Agricultural University (CAU), Imphal was established in the year 1993 under the Central Agricultural University Act, 1992 of the Parliament (Act No. 40 of 1992). It is a fully residential university having 13 constituent colleges covering 7 North-East Hill states under its jurisdiction except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

Academic Activities

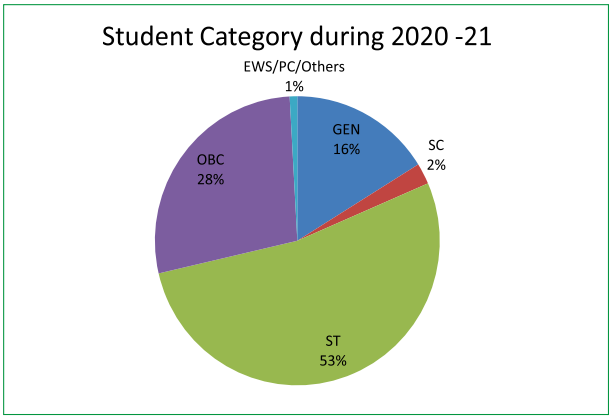
The University offered 9 Undergraduate, 38 Masters and 21 PhD degree programmes in different subjects/disciplines through its 13 constituent colleges. The university maintains common Academic Calendar for all courses except BV Sc & AH, which is governed by the Minimum Standards for Veterinary Education (MSVE Regulations of 2008, Veterinary Council of India). The selection/nomination of candidates is made through Competitive Entrance Test conducted by the concerned member state located within the jurisdiction of CAU, Imphal for undergraduate programme. Common entrance test is conducted by University for PG & PhD programme. 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's) to the Central Agricultural University, Imphal (Manipur) and its constituent colleges from 28 March, 2016 to 27 March, 2021.

Degree programmes and students strength in constituent colleges (Year 2020-21)

Name of the Faculty	Degree Programme	Intake capacity	Year wise student's strength						No. of Students Graduated in 2020-21
			1st	2nd	3rd	4th	5th	Total	
Agriculture	B Sc (Hons) Agri.	163	137	123	115	84	-	459	86
	M Sc (Agri)	123	86	105	-	-	-	191	75
	Ph D (Agri)	34	23	19	11	27	-	80	16
Horticulture & Forestry	B Sc (Hons) Hort	104	88	77	71	77	-	313	65
	M Sc (Horti)	12	11	13	-	-	-	24	07
	Ph D (Horti)	06	04	04	04	04	-	16	03
	B Sc (Hons) Forestry	35	28	23	24	22	-	97	15
	M Sc (Forestry)	05	04	07	-	-	-	11	03
Fisheries	B F Sc	46	42	40	34	27	-	143	26
	M F Sc	37	34	18	-	-	-	52	22
	Ph D	06	04	04	03	-		11	-
Veterinary Sciences and Animal Husbandry	BVSc & A H	110	106	99	70	87	45	407	55
	M V Sc	77	40	62	-	-	-	102	24
	Ph D	20	04	03	01	-	-	08	02
Agricultural Engineering and Food Technology	B Tech (Agril. Engg.)	58	42	33	22	35		132	26
	M Tech (Agril Engg)	21	08	14	-	-	-	22	06
	Ph D (Agril. Engg)	07	03	03	01	01	-	08	-
	B Tech (Food Tech.)	49	23	14	19	15		71	18
College of Community Science, Tura, Meghalaya	B Sc (Hons) Community Science	55	27	33	24	19	-	103	27
	B Sc (Hons) Food Nutrition & Dietetics	22	13	16	13	14	-	56	10
	M Sc (Community Science)	06	-	05	-	-	-	05	03
		996	**727**	**715**	**412**	**412**	**45**	**2311**	**489**



A total of 506, 183 and 38 students including 13 foreign students were admitted in various Under-graduate, Master and PhD programmes, respectively during the academic year 2020-21. A total of 328 UG and 140 PG students completed their degrees and 21 students were also awarded PhDs during this period. Out of the total students' strength of 2,311 in the university, 357 students belonged to the general category, 152 scheduled castes, 1,169 scheduled tribes, 614 other backward class and 19 students from EWS/PC/others Out of them, 990 students were male and 1,321 were female.



Till date, 73% of the passed out students from this University are already employed/absorbed in government departments. During the period under report, 10 students have qualified Agricultural Research Service (ARS), 14 students Junior Research Fellowship (JRF) examination and 4 students ICAR-SRF examination. Two students, viz. Keisham Geenita and D. Bernice Ekhe topped in the ICAR AIEEA JRF examination in the streams of Fisheries Science and Community Science respectively.

Research Activities

The University research aims to develop 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 up-liftment of the people of North-Eastern Hill Region. At present the university has 75 ongoing internally funded research projects and 112 externally funded projects including 35 All India Coordinated Research Projects (AICRPs) and 4 All India Network Research Projects (AINRPs). Farmer friendly technologies (86) and location specific recommendations (380) in the field of agriculture and allied disciplines were developed for adoption by the farmers and agri-preneurs of NEH Region. Three varieties of rice, viz. CAU-R2 (Tomthinphou), CAU-R3 (Mangalphou) and CAU-R4 (Enotphou) were released and notified in the Gazette. One patent on Multi-Column Sand Filter, a method thereof was also granted during the reporting year.

Faculties of constituent colleges of the university have published 825 research literatures comprising 342 full length research and 45 digital object identifier articles, 76 seminar proceedings, 138 papers presented in seminars, symposia, 76 popular articles, 15 books, 32 book chapters and 101 manuals/pamphlets, etc.

Extension Activities

The Directorate of Extension Education provides extension services to the farmers of seven North-Eastern states through various programmes and activities. The programmes implemented during the year include trainings, demonstration, field days, Kisan melas, farmer congress, exhibitions, radio talks, TV telecast, film shows, workshop, etc. Transfer of technology activities were planned and coordinated in different districts of the seven states through its 13 constituent colleges, six Krishi Vigyan Kendras and six Multi-Technology Testing and Vocational Training Centres.

Different extension activities were undertaken during the period aimed primarily to pass on the latest technologies to the farmers and create awareness among the farmers in different districts of the North Eastern states.

Extension services during 2020-21

Activities	Number
Training programme (on campus, off campus, vocational and distance education)	607
Agricultural Workshop	4
Awareness Programme, Farmer-Scientist Interaction Programme	114
Demonstration on cereals, oilseeds, pulses, vegetables, fruit crops, etc.	136
On Farm Trials (OFTs)	66
Kisan Melas	6
Field Day/ Animal Health camp / other important days	5
Exhibition / Road Show	3
Radio Talk and TV telecast	26
Extension literature	8
Success Stories published	50

A total of 46 capacity building training programmes for 861 extension functionaries of the line departments, KVKs, ATMAs and NGOs; 13 Vocational Training Programmes of three months and 531 need based hands on training programmes were organised in the field of agriculture and allied activities. Altogether, 228 numbers of Unemployed Youth and 23,393 farmers/ farm women/ rural youth were benefitted. Sixty Six numbers of different technologies were tested on the farmers field by involving 360 farmers of Arunachal Pradesh, Manipur, Meghalaya, Mizoram and Tripura. Besides 136 Front Line Demonstrations were conducted covering 721.65 ha and benefitting 2,087 of farmers.

A total of 30 externally funded extension research/ adaptive research projects have been implemented by the Directorate of Extension Education with total financial outlay of ₹15.58 crores. University has started ICT based extension services through M4agri project supported by DIC, New Delhi in two states, viz. Mizoram and Tripura. A total 6,365 farmers registered and 5,901 advisories were issued to farmers on agri and allied sectors. During

the period, 50 Success Stories of Farmers were compiled and published with ISBN. KVK- Imphal East, CAU, Imphal was awarded Pandit Deen Dayal Upadhyay Krishi Vigyan Protshahan Puraskar 2019 under Zone VII for their outstanding activities in the last five years.

Human Resource Development

The University has total staff strength of 1,102 including, 298 teaching and 776 non-teaching positions. At the headquarters, there are 14 executive officers in the administrative positions supported by 33 technical and 112 non-technical staff. In the constituent colleges of the university, there are 13 Deans, 298 teaching and 630 non-teaching staff. During the year, 90 teaching and non-teaching staff were appointed, 25 staff members were transferred, 7 superannuated, 2 demised and 10 resigned from the service. One hundred fourteen staff members were also promoted. Faculty members were deputed for participation in 252 international/national conferences/seminars/workshops/long/short term training courses. A total of 110 trainings, workshops, conferences, seminars, summer schools, etc. were organized at different constituent colleges of the university. Ten MOU's were signed with reputed institutes during the period for cooperative relationship through mutual assistance in the areas of education, research and extension activities.

Sports, Cultural and Literary Activities

The University is instrumental in catering to the need of regular games and sports, cultural and literary activities for the students of all colleges. It organises annual Youth Festival-cum-Games and Sports Meet, trials and coaching camps for the selection of University Teams for participation in All India Agri-Unifest under the auspices of Association of Indian Universities and All India Inter Agricultural University Sports and Games Meet sponsored by the ICAR. During the period, 22 students participated in 20thAll India Agri-Unifest and 22 students in 20thAll India Inter University Games and Sports meet which was held at IGKVV, Raipur and SVVU, Tirupati respectively. Two students, viz. B. Keyang and Anu Lakandri Lalhruaitlungi secured 3rd position in High jump (Men) and 2nd position in badminton (Woman) respectively.

Visitors

The university witnessed the visits of 120 visitors in different college campuses located in seven states of the north-east hill region of India during the reporting year. The visitors included eminent administrators, scientists, faculties, meritorious students and progressive farmers of varied experiences.

Dr. Rajendra Prasad Central Agricultural University (DRPCAU), Pusa, Samastipur, Bihar

Dr Rajendra Prasad Central Agricultural University, which came into existence on 7 October 2016 after conversion of Rajendra Agricultural University into a Central University, has made outstanding progress over the short span of 4-years to accomplish its vision of Advancing professional competency for pursuing excellence in education, research and entrepreneurship in relation to agriculture and allied sectors with ethical values to meet the regional, national and global needs and offering specialized services to the farmers for decent livelihood.

Following were some of the major achievements of financial year 2020-21:

Proud Moment

The honourable Prime Minister of India Sri Narendra Modiji has inaugurated the new building of "School of Agribusiness & Rural management" and also laid the foundation stone of new facilities-hostels, International Guest house, etc. on 10th September 2020.

The University has the honour to find a place under top ten best among Government Universities of the country by India Today- MDRA survey, 2020. Hence RPCAU became first Agricultural University in India ranked under top ten till date. Further, survey indicated that it is 1st University/ Agricultural University in Bihar under top ten in a national ranking survey. The university also got 5th spot in best student-teacher ratio.

Academic Activities

The university is making all efforts to develop highly qualified human resources in agriculture and allied disciplines. During the year 2020-21, new addition has been made in the academic programme and started new PG programme in two disciplines-Clothing and Textile, Seed Science and Technology and Ph D programme in three disciplines-Food and Nutrition, Farm Machinery and Power Engineering, Processing and Food Engineering. Thus the University has total intake capacity of 319 students in 6 disciplines of UG Programme, 286 students in 26 disciplines of PG Programme and 38 students in 13-disciplines of Ph D programme. The University has taken several initiatives for academic reforms. The automation of university activities has been started and the anti-plagiarism has already been introduced during the year 2020 to ensure ethics in research and thesis. The academic Programme of the University was shifted to online mode from the last week of March, 2020 to cope up with pandemic of COVID-19. Every effort was made to protect the interest of students. The study materials related to ongoing courses were uploaded on the university website for access by the students. The classes were conducted online using digital platform– google meet, email, whatsapps, etc. The quiz, midterm and final examination of winter semester were conducted

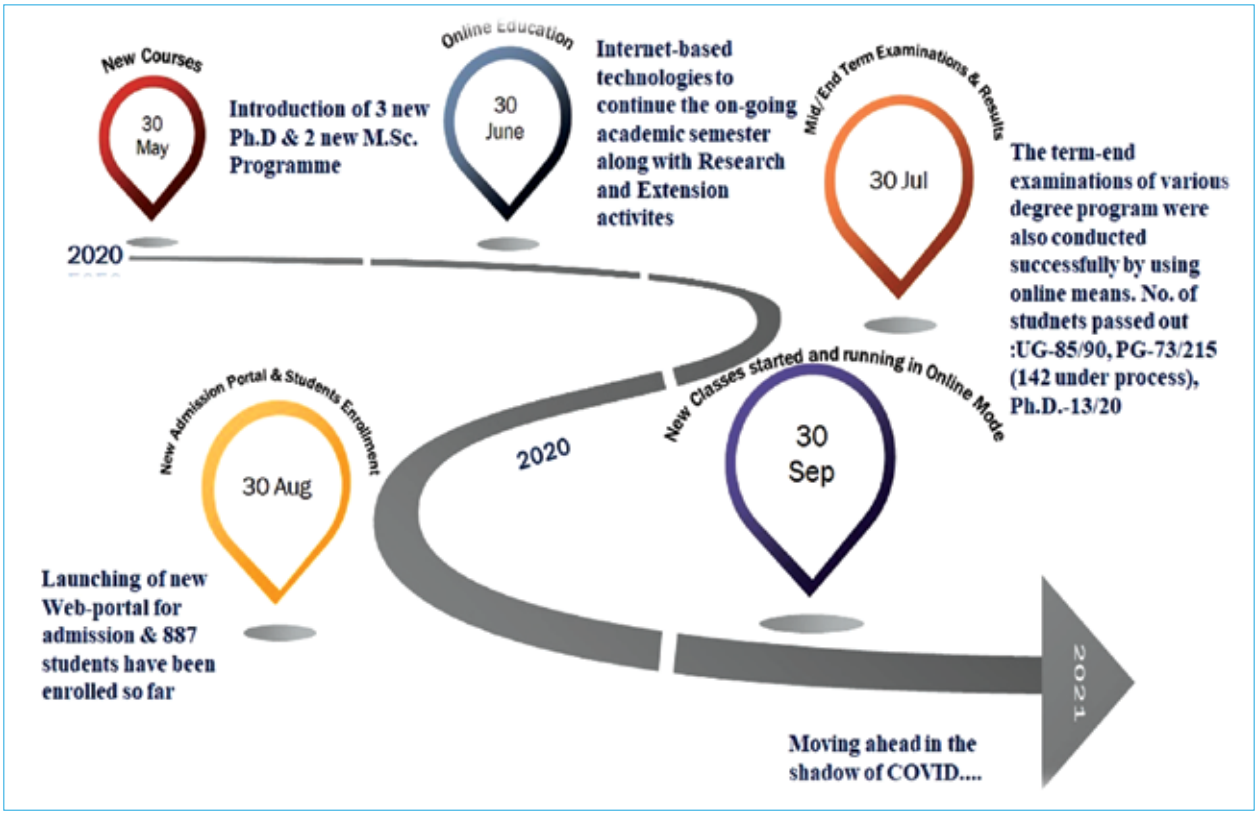
TOP 10 GENERAL UNIVERSITIES (GOVERNMENT)

1	JAWAHARLAL NEHRU UNIVERSITY, *New Delhi*
2	UNIVERSITY OF HYDERABAD, *Hyderabad*
3	ALIGARH MUSLIM UNIVERSITY, *Aligarh*
4	OSMANIA UNIVERSITY, *Hyderabad*
5	UNIVERSITY OF CALCUTTA, *Kolkata*
6	MAHATMA GANDHI UNIVERSITY, *Kottayam*
7	COCHIN UNIVERSITY OF SCIENCE & TECHNOLOGY, *Kochi*
8	JAMIA MILLIA ISLAMIA, *New Delhi*
9	TATA INSTITUTE OF SOCIAL SCIENCES, *Mumbai*
10	DR RAJENDRA PRASAD CENTRAL AGRICULTURAL UNIVERSITY, PUSA, *Samastipur, Bihar*

FIVE GENERAL UNIVERSITIES (GOVT) WITH THE BEST TEACHER-STUDENT RATIO*

RANK	UNIVERSITY	RATIO
1	UNIVERSITY OF AGRICULTURAL SCIENCES, *Raichur*	1.57
2	PROFESSOR JAYASHANKAR TELANGANA STATE AGRICULTURAL UNIVERSITY, *Hyderabad*	1.52
3	TAMIL NADU AGRICULTURAL UNIV., *Coimbatore*	0.89
4	ASSAM AGRICULTURAL UNIVERSITY, *Jorhat*	0.81
5	DR. RAJENDRA PRASAD CENTRAL AGRICULTURAL UNIVERSITY, PUSA, *Samastipur, Bihar*	0.78

*Only the PG student count was considered to calculate the ratio; for total faculty, permanent, visiting and contractual/ ad hoc faculty were factored in



online and results were declared. Out of total 1,197 students, 887 ongoing students have been admitted to the Monsoon semester, 2020 and their classes have been started online. To enhance the visibility of the University, the provision has been made for admission of In-service students, overseas students and Industry sponsored students and the application has already been invited for their admission in new session (2020-21) in PG and Ph D programmes.

Placement at glance

Thirteen students have been placed in five different firms with an average annual package of ₹ 4.13 lakh and the highest package of ₹ 7.20 lakh.

Research Activities

The University has been well equipped with scientific human resources, sufficient infrastructure, 36 AICRPs, 5-International projects,7-government of India funded projects, 5-government of Bihar funded projects, a large number of university funded projects which are devoted for development of crop varieties and technologies to improve the livelihood of farming community. The university has developed a rice variety Rajendra Saraswati, a maize variety Rajendra Hybrid Makka-4 and a sugarcane variety Rajendra Ganna-1 which were earlier recommended by the University and SVRC have now been notified by CVRC.

Variety : Rajendra Saraswati **Year of Recommendation/ Notification:** 2020 **Recommendation/ Notification Agency:** CVRC **Notification No./ Date/ Year:** 3-76/2019 dated 29th July 2020 **Pedigree/ Parentage:** IR36/ Type 3 **Breeding Method:** Pedigree Method **Released for the Area/ State:** Bihar	
Variety : Rajendra Hybrid Makka-4 **Year of Recommendation/ Notification:** 2020 **Recommendation/ Notification Agency:** CVRC **Notification No./ Date/ Year:** 3-76/2019 dated 29th July 2020	
Variety : Rajendra Ganna-1 (CoP 16437) **Year of Recommendation/ Notification:** 2020 **Recommendation/ Notification Agency:** CVRC **Notification No./ Date/ Year:** 3-76/2019 dated 29th July 2020 **Pedigree/ Parentage:** CoSe 92423 x CO 1148 **Breeding Method:** Clonal Selection **Released for the Area/ State:** Bihar	
Pedigree/ Parentage: BML-6 X HKI- 163 **Breeding Method:** Hybrid **Released for the Area/ State:** Bihar **Salient Features:** It matures within 155-166 days. It has been recommended for *rabi* season. It has 100-110 q/ha yield potential.	

Technology Development and Adoption

Climate resilient crop technology and climate smart agriculture programs: Under Climate Resilient Agriculture Program, demonstrations on Direct Seeded Rice were conducted in Sukhet, Bisaul and Machhdhi villages of Madhubani (218 acres) and Ranko, Chatar and Bachchauta villages of Khagaria (218 acres). High yielding rice variety Rajendra Mahsuri was transplanted in 302 acres area following green manuring. Demonstration on sowing of soybean through dibbling was taken up.Under the Climate Smart Agriculture Program, demonstration on Direct Seeded Rice was conducted in 25 villages on Samastipur-Darbhanga State Highway (around 950 acres). Water saving irrigation techniques are being adopted through alternate-wetting-and-drying in 203 acres and nitrogen saving recommendation are being made in 267 acres taking both the projects together. Demonstration on 'Enhancing productivity of rice-wheat cropping system through assured irrigation'

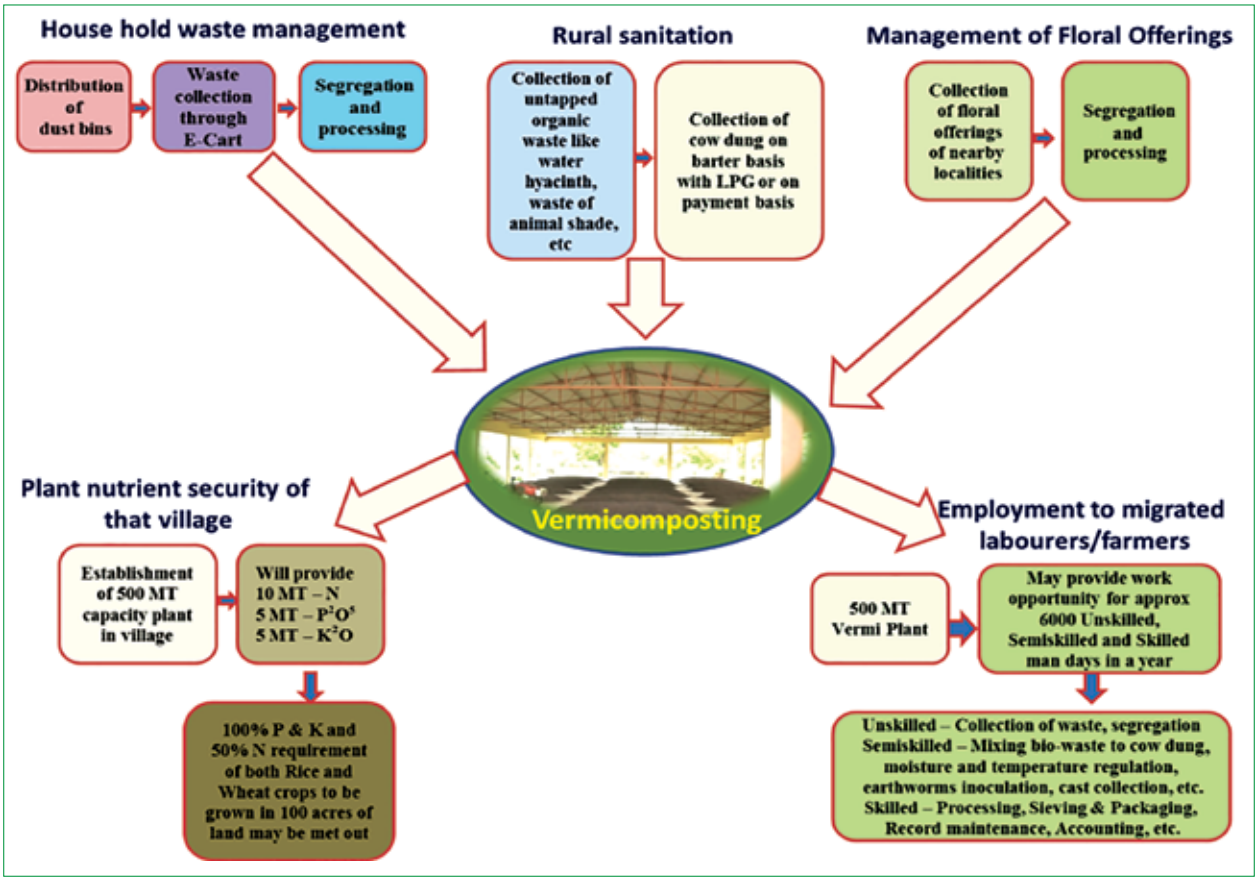
has been conducted in 17 KVKs (255 acres).The university is targeting a suitable contingency plan of taking vegetable crops to cope up the gap in the cropping season without delaying the wheat sowing beyond 15th November.

Infrastructure Development

Centre of Excellence on Food Processing and Advance Centre of Research on Wealth from Waste were Inagurated: On the 28th August, 2020 the inaugural ceremony was graced by Dr Prem Kumar, Hon'ble Minister of Agriculture, Animal Husbandry and Fisheries, Government of Bihar as the chief guest in presence of Shri Maheshwar Hazari, Hon'ble Minister of Planning & Development cum-Industry Department, Government of Bihar. The Hon'ble Vice Chancellor Dr R C Srivastava in his presidential address apprised the chief guest with the research and other activities of the University and its centers. The chief guest appreciated the research works and services of the RPCAU for the upliftment of agriculture and assured to provide all help from the Government whatever is needed. An exhibition of research activities and products developed under the Centers was organized.

Commercialisation of technologies through the Center for Start-up Facilitation: Center for Start-up Facilitation was inaugurated by Giriraj Singh, the Minister of Animal Husbandry, Dairying and Fisheries during the Kisan Mela, 2020. Incubation agreement between Center for Start-up Facilitation, RPCAU, Pusa and the Adventure Organic Farms Private Limited, Patna was executed on July 09, 2020, for the commercialisation of products, viz. honey, mushroom products, jaggery and herbal gulal. This is a giant leap of the university from 'Research and innovation' to the present need for entrepreneurship.

Self sustained village model



Extension Activities

The university has developed adequate infrastructure and efficient system for dissemination of technology through Directorate of Extension Education, Agriculture Information Technology Centre (ATIC) and Agro-advisory service at headquarter level and 16 KVKs at different districts under jurisdiction of the university. During the year 2020, the farming community were trained in the area of Mushroom production, Honeybee, Vermi-composting, production technology of different crops, etc. As a precautionary measure, against COVID-19 pandemic, the virtual platform such a google meet and whatsapp, were effectively used for conducting training programme of various stake holders-practicing farmers, rural youth, extension functionaries, etc. The activities such as field visits, FLD, OFTs were conducted following proper social distancing, use of mask and all the guidelines issued by the Government. During the year 2020, total seven hundred sixty (760) trainings were conducted to educate ten thousand eight hundred thirty six (10,836) participants of various categories-practicing farmers, school dropout and in-service candidates. Besides total 51 on-farm trials were conducted involving 521 participants and Mobile based agro-advisory service was provided to 1,47,661 farmers.

Production and distribution of seeds/planting materials: During the period under report, 1,419.5 q seeds were produced and 197 q seeds were distributed among 2,180 participants. Likewise, 47,341 q planting materials were produced and 48,635 q were distributed among 6,010 participants.

Distribution of soil health cards: During the period under report 2,883 soil samples were collected, 2,456 samples were analysed and 2,537 health cards were issued.

Social responsibilities:

- Initiated training programme at various KVKs under the PM Garib KalyanYojna to poor and large number of migrant labourers.
- Awareness programme through phone call, SMS, whatsapp group, leaflets, posters for Do's and don'ts regarding COVID-19.
- Shared RTPCR machine with Shri Krishna Medical College, Muzaffarpur for the test of COVID-19.
- Distribution of Bal Shakti- 500 kg to nearby slums.
- Distribution of hermetic bags for storage of wheat- 4,000 bags to 1,000 resource poor famers.
- Fabrication and distribution of mask to the COVID-19 warriors, vegetable vendors and policemen.

Initiative taken for re-skilling of migrant returnee during COVID-19 pandemic

The university has come forward to shoulder the responsibility of re-skilling the Migrant returnee (labourers) through technologies developed by the university to help them in their rehabilitation. Some of the special trainings which have been started at the University headquarters and various KVKs in the University are given hereunder:

- Household waste-management and other wastes for organic manures.
- Rearing of fast-growing Boar breed of Goat.
- Mushroom cultivation, production and processing.
- Culturing of fish wherever good water depth is available.

- Use of University's developed solar cart for hygienic sale and keeping the product for longer using solar energy.
- Re-circulating aquaculture in lesser space.
- Wealth from waste like produce from banana, bamboo, pigeon pea stems, etc.
- Skill development, technical know-how and maintenance work training.
- Empowering women in small know-how like Herbal Gulal making, Energy food preparation, value-addition like mushroom processing by making Samosa, ladoo, snacks pickles, ornamental fish culture and honey production.

Online Engagement of the University

More than 20 Webinars and Online Trainings have been conducted by different colleges and units.

Students Activities

A contingent of 36 players of university students (23 boys and 13 girls) participated in XX All India Inter-Agricultural Universities Sports & Games Meet 2019-20 at Venkateshwara Veterinary University, Tirupati.

Twenty two students of the university participated in the 20th All-India Inter-Agriculture Universities Youth Festival (Agri UniFest) 2020 hosted by IGKV, Raipur.

Rani Lakshmi Bai Central Agricultural University (RLBCAU), Jhansi, Uttar Pradesh

The Rani Lakshmi Bai Central Agricultural University, Jhansi made sustained strides towards achieving its mandated objectives and goals in the field of agricultural education, research and extension as an institution of national importance.

Academic Activities

The University continued to admit students for different UG/PG programme in the field of agriculture, horticulture and forestry through national level entrance examination organized by Indian Council of Agricultural Research, New Delhi to maintain multilingual and multicultural environment at the campus. New PG programme in five subjects, viz. Soil Science, Entomology, Vegetable Science, Fruit Science and Silviculture and Agro-forestry were initiated in postgraduation from the current academic session. The reservation policy for students from economically weaker section was implemented successfully by corresponding increase in the total student intake following norms set by the Government of India. The University Internal Quality Assessment Cell was made fully functional with the defined goals and functions. In the wake of COVID-19 global pandemic, best possible efforts were made to train both the teachers and the students to continue planned educational activities on digital platform. The faculty and students were also active participant of Swachh Bharat Abhiyan, National Social Service, National festivals, games and sports, Hindi Pakhwara, and extra-curricular activities.

Research Activities

The University released its first ever variety RLB Chana Kabuli-1 (RLBGK 1). The main features of the variety include mean weighted seed yield of 1,549 kg/ha, besides resistant/moderately resistant to *Fusarium* wilt, dry-root rot, collar rot and stunt.

Research work under various ICAR-AICRPs, viz on Chickpea, and Rapeseed-Mustard, Maize, barley, pearl millet, MULLaRP and Sesame and Niger was undertaken towards enhancing productivity and production of these crops through development of high-yielding, multiple disease-resistant varieties for central India. Water absorption capacity of Desi and Kabuli chickpea cultivars showed wide variations among the respective groups. The mean per cent water absorption capacity of Desi and kabuli chickpea cultivars was 90.6 and 92.7, respectively. Seedling vigour showed wide variations from 0.46-4.34 cm in Desi group and 0.48-2.95 cm in Kabuli group, with a mean of 1.64 cm and 1.60 cm, respectively.

RLB Chana Kabuli (RLBGK) 1

A set of 82 indigenous wheat germplasm lines, released varieties, and genetic stocks were also evaluated for different agro-morphological characters and biotic stresses. A coordinated germplasm nursery of wheat (Elite International Germplasm Nursery, EIGN) with 91 germplasm lines, was evaluated. Fifteen promising wheat genotypes were identified from EIGN based on yield and chlorophyll content. The sowing techniques for greengram were standardized to promote line sowing for increasing crop productivity and input-use efficiency. Time taken by different sowing machines was the lowest for zero-till ferti-seed drill, i.e. 4 hr/ha, whereas it was maximum under farmer's practice (6.5 hrs/ha). Similarly, seed yield obtained

under the conventional method was 22.4-33.3% lower (542 kg /ha) as compared to other techniques.

A study on diversity of various insect pollinators on mustard during blooming period showed that insect species belonged to orders Diptera, Hymenoptera and Coleoptera. Among these the syrphids (order Diptera) were most dominating.

Performance of different cultivars of pomegranate, viz. Bhagwa, Super Bhagwa, Ganesh, G-137, Ruby, Mridula, Arkata and Jalore seedless was evaluated. Maximum plant spread north to south × east to west was recorded in Ruby followed by G-137 and Arkata. Based on the study, cultivar Ruby and Super Bhagwa were found suitable for cultivation in Bundelkhand region. Twelve spray type cultivars of chrysanthemum were evaluated for different growth and flowering parameters. 'White Star' and 'Karnal Pink' were found promising for the region.

Extension Activities

Front Line Demonstrations (329) were organized at farmer's field on rapeseed-mustard (45), chickpea (10), groundnut (150), maize (80), rice (17), sesame (21), mung-bean (4) and pigeon pea (2) in Jhansi, Datia, Tikamgarh and Niwari districts.The results of FLDs in rapeseed-mustard convincingly proved that by adopting the improved production practices, farmers could get an average 26.00% increase in productivity (1,467 kg/ha) over indigenous practices (1,166 kg/ha) with an average net monetary benefit of ₹ 12,069/ha. Improved technology provided farmers an alternative and better response in getting higher yield in chickpea. There was 20.00% of seed saving, optimum plant population and 27.3 to 40% higher yield advantage over farmer practices by using chickpea RVG-202. The net return (₹/ha) using improved practices was ₹ 42,978 per ha in comparison to ₹ 28,528 per ha by using farmer practices. Besides FLDs, several on-farm/off-farm demonstrations, field diagnostic surveys, field days and training programs were conducted for farmers to popularise scientific cultivation of various crops including pulses, oilseeds, fruits, vegetables and medicinal plants. To facilitate reach of the farm advisory at the farmer's door step, a dedicated Farmer's Corner was incorporated in the University website (http://www.rlbcau.ac.in/Farmers_corner.php).

Infrastructure Development

A significant headway was made to complete the on-going construction of Academic Building for College of Agriculture, Horticulture and Forestry, Administrative building, VC residence, Hostels and few faculty residences at Jhansi. Shri Narendra Modi ji, Hon'ble Prime Minister of India dedicated the newly constructed Academic and Administrative buildings virtually to the nation on 29th August, 2020. After the inauguration, the Prime Minister interacted with university students and asked about ways to address certain challenges like reducing import of edible oils and increasing food processing, especially in fruits and vegetables. During the interaction, the Prime Minister stressed on promoting recycling of water and rain water harvesting through innovative and less costly technology in the region.

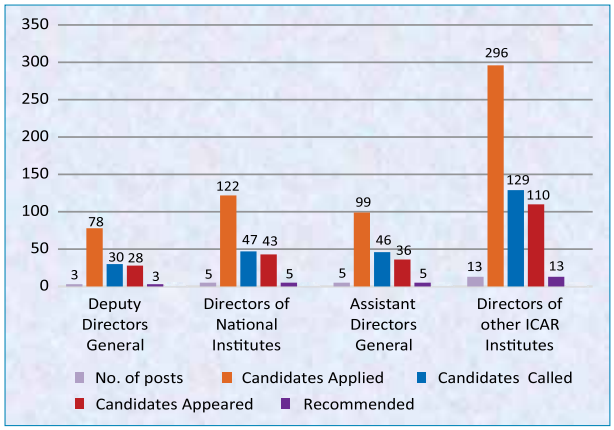
Sri Narendra Singh Tomar ji, Hon'ble Minister of Agriculture and Farmers Welfare, Government of India laid the foundation of College of Veterinary & Animal Science and College of Fisheries at Datia campus of Rani Lakshmi Bai Central Agricultural University, Jhansi on 27th September, 2020. Speaking on the occasion, Hon'ble Minister expressed confidence that the colleges will benefit farmers not only in the Bundelkhand region but the entire country.

Academic Building of the University

Agricultural Scientists Recruitment Board (ASRB)

Direct Recruitment/Lateral Entry

During the year, recruitment process for 26 posts has been completed. Comprising of three Deputy Directors General, five Directors of National Institutes, five Assistant Directors General and thirteen Directors of ICAR Institutes.



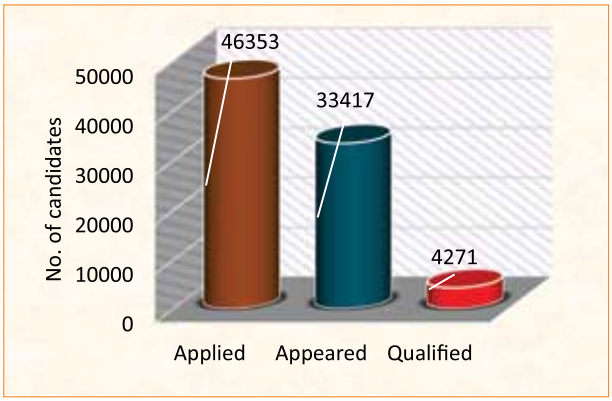
Summary of Direct Recruitment process completed during the period

View of Interview Board

In all, the Board had screened 595 applications and called 252 candidates for interview. However, 217 candidates actually attended the interview. The Board interviews first 10 ranking candidates for each post.

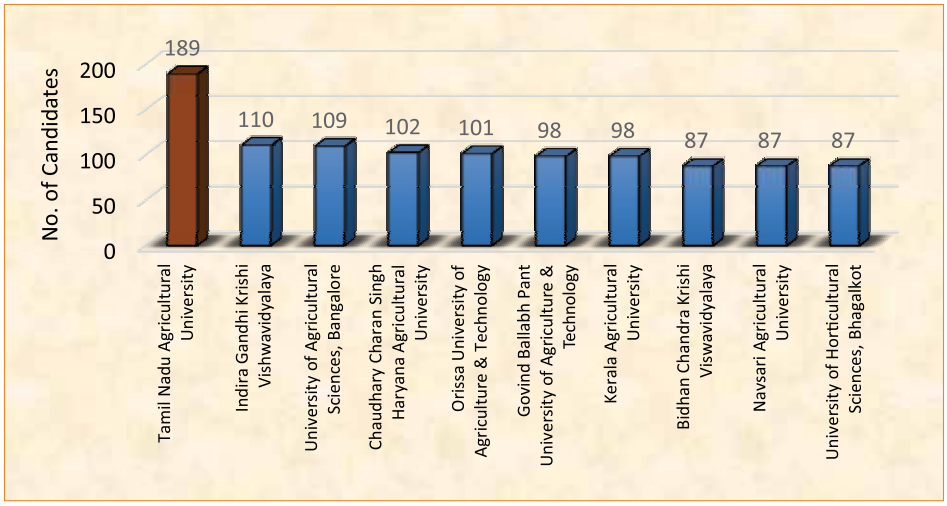
National Eligibility Test (NET) Examination-2019

During the year, ICAR-National Eligibility Test (NET)-2019 examination was conducted in online mode in 57 disciplines at 31 centres across the country from 9th January, 2020 to 11th January, 2020. NET is an essential prerequisite qualification for determining eligibility for recruitment of Lecturers/Assistant Professor in State Agricultural Universities (SAUs) and other General Universities with Agricultural Faculty. A total of 46,353 candidates had registered for the Examination and 33,417 candidates actually appeared in the examination. A total of 4,271 (12.78%) candidates qualified the examination.



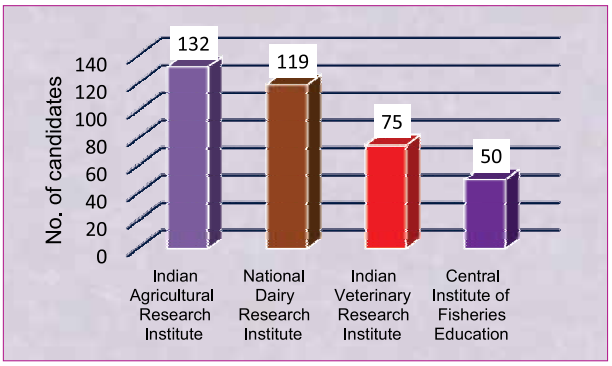
Details of NET Examination

The lowest percentage of candidates qualified is in the discipline of Aquaculture (0.44%) and the highest percentage of qualified candidates in the examination were in the disciplines of Veterinary Anatomy (60%) followed by, Poultry Science (52.73%), Fish Genetics and Breeding (50%) Veterinary Parasitology (40.85%), Land and Water Management Engineering (39.75%), Livestock Production Management (39.65%), Spices, Plantation and Medicinal and Aromatic Plants (39.22%), Fruit Science (37.70%), Fish Process Technology (37.64%) and Seed Science & Technology (33.17%). In 10 disciplines, i.e. Agricultural Biotechnology, Livestock Product Technology, Genetics and Plant Breeding, Computer Applications and IT, Agricultural Economics, Agricultural Extension, Plant Physiology, Bioinformatics, Food Technology and Economic Botany and Plant Genetics Resources the success rate was below 5% and in three discipline, i.e. Plant Biochemistry, Environmental Science and Agricultural Business Management were non-qualified.



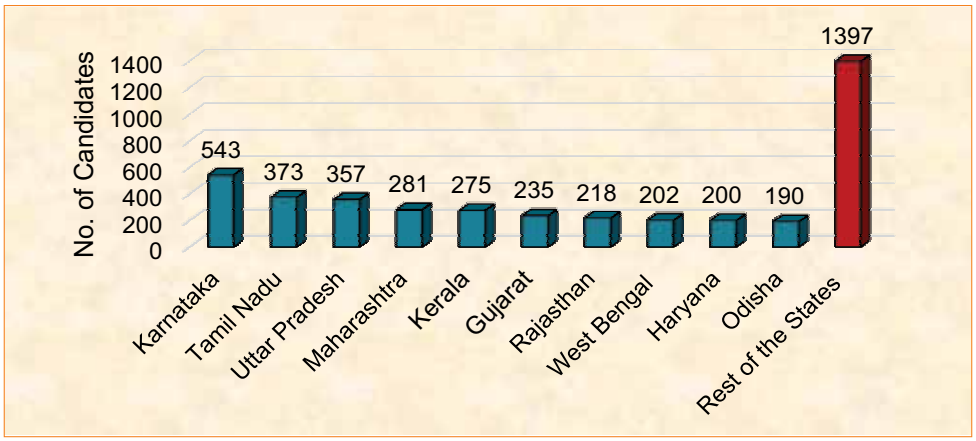
Top Ten SAUs wise details of successful candidates in NET Examination

Analysis of the data showed that out of 4,271 qualified candidates in the examination, 1,068 (25%) were from top 10 State Agricultural Universities (TNAU, Coimbatore; IGKV, Raipur; UAS, Bengaluru; CCSHAU, Hisar; Orissa University of Agriculture and Technology, Bhubaneswar; GBPUA&T, Pantnagar; KAU, Thrissur; BCKV, Nadia; Navsari Agricultural University, Navsari and UAH, Bhagalkot), 1,723 (41%) were from rest of SAUs, 999 (23%) were from General Universities with Agriculture Faculties, 376 (9%) were from Deemed to be universities (IARI, New Delhi; IVRI, Izatnagar; NDRI, Karnal and CIFE, Mumbai) and 105 (2%) from Central Agricultural Universities.

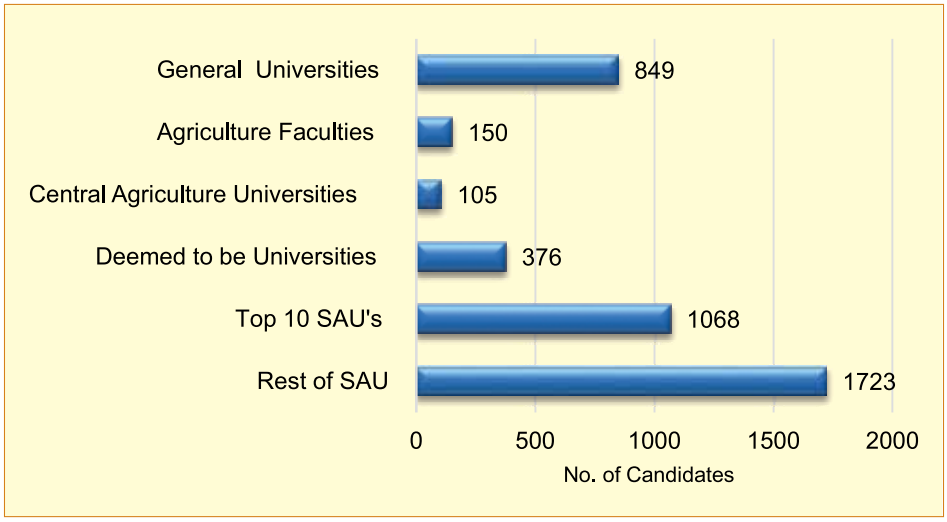


Performance of ICAR Deemed-to-be Universities in NET Examination

Out of 4,271 qualified candidates about 67% of successful candidates were from 10 states (Karnataka, Tamil Nadu, Uttar Pradesh, Maharashtra, Kerala, Gujarat, Rajasthan, West Bengal, Haryana and Odisha).

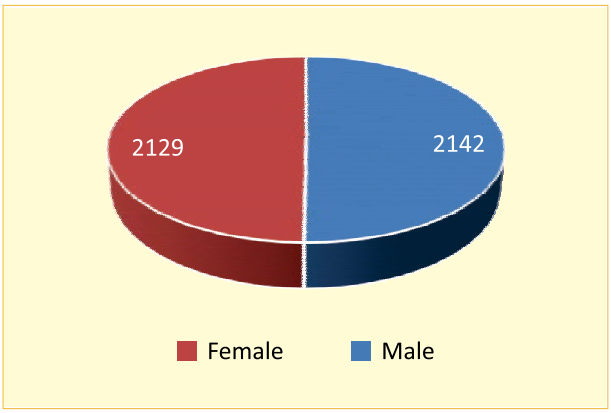


State wise performance in NET Examination 2019



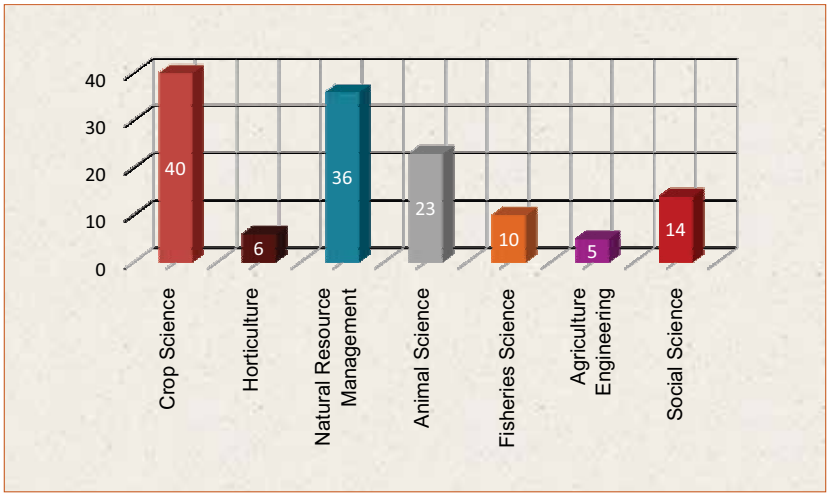
Organization wise performance of candidates

Among 4,271 qualified candidates in NET Examination, 50.15% were female candidates.



Assessment/Promotion of Senior Scientists under Revised Career Advancement Scheme

During the year, 134 proposals in 33 disciplines received from different ICAR institutes were assessed for promotion/assessment from Senior Scientist to the grade of Principal Scientist under the revised Career Advancement Scheme (CAS) and the recommendation has been sent to the Council. Major discipline wise breakup of CAS proposals is as follows:



Detail of assessed proposals

REFORMS

Digitization: For easy retrieval of the NET certificates which were earlier issued in printed form, Board has initiated digitization of NET certificates of NET Examination-2018 (I & II) awards. Now, NET certificate for the exam NET 2018 onwards, can be downloaded through DIGILOCKER app of MeitY, Government of India.

Online examinations: ASRB has gradually shifted from Conventional pen and paper examination to on-line computer based tests. During the year, Board has conducted successfully one National Eligibility Examinations-2019. In this examination a total of 46,353 candidates had registered.

Screening and interview: ASRB has established Video Conferencing facility for screening and interview. Presently, the interview of 134 candidates for Assessment/Promotion under Career Advancement Scheme and 73 candidates for Direct Recruitment Research Management positions have been successfully conducted through this facility.

Promotion of Hindi (Rajbhasha)

ASRB is committed to promote progressive use of Hindi in its office to fulfill targets fixed in the annual official language programme 2020-21 as per the official language policy of Department of Official Language, Ministry of Home Affairs, Government of India. The Board fully ensures that bilingual requirement of the circulars, reports, question papers and other documents, as per the provisions of the Act and Rules, are meticulously complied with.

Quarterly meetings of official language implementation: During the period, Board has organized three quarterly Official Language Implementation Committee meetings in March, June, September, 2020. Various issues pertaining to Official Language Implementation were discussed and decisions taken in this meeting.

Celebration of Hindi Pakhwada: During the year ASRB has organized "Rajbhasha-Hindi Pakhwada" from 9th September, 2020 to 24th September, 2020. All Officials/Officers including contractual staff were present on this occasion. Chairman and Members, ASRB attended Hindi Pakhwada inauguration ceremony through video conferencing, Chairman, ASRB formally addressed and advised that we should know all languages but should not forget official language.

During the Hindi Pakhwada, three competitions were held on different aspects of use of Hindi, viz. Essay Writing, Noting and Drafting and Hindi Typing in Unicode where in 27 regular and 25 contractual employees participated in the competition.

Details of competitions

Competitions	Dates	Regular	Contractual	Total
Essay writing	10.09.2020	9	8	17
Noting & Drafting	15.09.2020	10	10	20
Hindi Typing in Unicode	18.09.2020	8	7	15
Total		**27**	**25**	**52**

A valedictory function was also organized on 24th September, 2020. Chairman, ASRB appreciated the progress of implementation of official language policy in ASRB. Cash Prizes and certificates were distributed to the winners of various events. The function ended with a formal vote of thanks.

Best Performance Award

Agricultural Scientists Recruitment Board has been nominated by the Department of Official Language, Northern Regional Implementation Office-1, Ministry of Home Affairs, Government of India vide letter No क्षे.रा. पु. / 2018 / उक्षेकाका–1(दि) / दिनांक 20.01.2020 for First Prize in the category of 11 to 50 employees in "A" Region for best performance in promotion and implementation of official language and hindi work for the year of 2018-19.

Agrinnovate India Limited

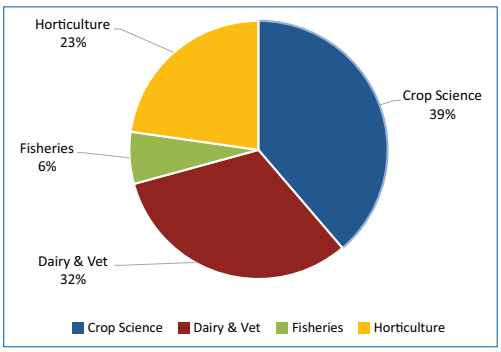
Agrinnovate India Limited (AgIn), a Government of India enterprise, is steadily moving towards meeting its objective of stimulating and fostering innovations in agriculture and building 'A world of Innovative Partnerships'. As an effective interface between Indian Council of Agricultural Research (ICAR- an autonomous organization under DARE) on one side and the Stakeholders of agricultural sector (Farmers; Public & Private Sector firms; R&D organizations) on the other, AgIn strives to secure and promote sustainable technologies from NARES for the overall development of agribusiness sector.

The company has successfully been able to turn a new leaf in the recent past by initiating effective partnerships with ICAR institutes and private companies. The company's revenue from operations touched ₹ 1,53,76,950 for the first time in nearly a decade, as against ₹ 30,57,630 during the previous Financial Year (2018-19). Accordingly, the company's net profit stood at ₹ 2,80,89,362 as against ₹ 2,36,63,549/- since the last Financial Year 2018-19.

Business development activities

With a revamped website and increased efforts at bringing over 35 ICAR institutes developed technologies under AgIn's purview, nearly 340 technologies have been added for the list of technologies ready for commercialization through Agrinnovate.

During the year 2019-20, AgIn effectively handheld several ICAR institutions and helped transfer a total of around 52 technologies earning a gross revenue of ₹ 1.54 crores. Sectors of crop sciences (39%), dairy and veterinary sciences (32%), horticulture (23%) and fisheries (6%) contributed significantly in this endeavor of AgIn.



Sector-wise distribution of revenue through technology transfer at Agrinnovate.

Promotional activities

AgIn undertook several initiatives for developing business for the technologies from different ICAR institutions and SAUs. These efforts included, creating awareness about its activities and services to various stakeholders; participation in various workshops and national level meets and presenting the activities of AgIn. Significant among these include,

- Revamping AgIn's website (www.agrinnovate.com);
- Conducting 'Agriprenuership programme' (10th June 2019) for 70 participants from across the country,
- Co-sponsoring 'Pineapple Festival' with CII & Tripura Horticulture Department to create awareness about AgIn's activities at Agartala (28-29 June, 2019);
- Participation in FICCI sponsored two days 'Global Summit' on India-African technology transfer initiative at Hyderabad (22-23 April, 2019);
- Participation in an International programme of 'Feed the Future' on 'start-up to scale up' organized by MANAGE, Hyderabad (June 2019);
- Participation and presentation at VAIGA 2020-Sustainable Development through Agriprenuership, Cochin, Kerala (January 2020);
- Participated and presented on the activities and role of AgIn at the seminar organized by Atal Innovation Mission, at AIM Institute Chattarpur, New Delhi (Nov 2019);
- Presented the activities of AgIn at CII's Northern Region's Conference on Innovations and Entrepreneurship in Agriculture, New Delhi, (6th March, 2020).

Technology agreement hand over to a licensee at Agrinnovate India Limited.

The salient achievements of the Council during the reporting period are described below.

Soil and water productivity

Soil samples from five different bio-climates were analyzed for soil organic carbon (SOC) and soil inorganic carbon (SIC) to assess soil quality. Soil quality assessment was done in areas dominated by cotton and sugarcane-based cropping systems (AESR 6.1) and rice-based cropping system (AESR 18.4). Land Resource Inventory (LRI) on a 1:10000 scale were prepared in GIS environment for the different blocks of Manipur, Nagaland, and Sikkim to generate site-specific information needed for farm/ village level planning. An attempt was made to test glauconite nano-particle as a potassic fertilizer. Glauconite nanoparticles (GNP) were prepared by top down method. Application of GNP recorded higher crop yield and proved steady releasing behavior of K from GNP throughout the crop growth period.

Area/region specific efficient and remunerative crops and cropping sequences were delineated based on soils, landforms, rainfall, temperature, length of growing period and irrigability. The potential areas of rice and oil palm of the country were delineated.

Two bioreactor unit namely "Ekcel-CompostR" and "Ekcel-ShredR" for rapid decomposition of waste biomass were developed. The final compost product was ready within 25-30 days of decomposition.

Bioreactor for rapid composting

Water and nutrient (N) management in rice–wheat systems using subsurface drip irrigation (SDI) was standardized with laterals spacing and depth at 67.5×20 cm in normal soil and at 45×15 cm in salt affected soils, respectively. Three different designs of groundwater recharge filters viz. one stage downward flow type, one stage upward flow type and two stage upward-downward flow type groundwater recharge filter was developed by ICAR-IISWC, RC-Vasad.

Automated drip fertigation in okra crop was evaluated for improving water use efficiency at Udaipur, Rajasthan. Irrigation water was applied automatically based on availability of soil moisture in the crop root zone sensed by soil moisture sensor.

Automated drip fertigation for increasing water productivity of okra crop at Udaipur

Organic farming packages for 4 cropping systems suitable to Gujarat, Kerala, Rajasthan, Sikkim and Uttarakhand were developed as per National Programme for Organic Production (NPOP) standards.

Cassava under organic production system

Four integrated farming system models were established for round the year income and employment. Similarly, two IFS models for Gujarat and Rajasthan comprising crops, horticulture and livestock were established.

Integrated farming system model for wetland ecosystem of Andhra Pradesh

Effect of feed loading on sediment accumulation rate, carbon storage and fish growth under a polyculture system of Indian major carps was assessed in 16 ponds (5.0–56.0 ha) located at Moyna, East Medinipur district of West Bengal.

Climate change and resilient agriculture

To stop the decline of groundwater table in Muzaffarnagar district of Uttar Pradesh, a two

Underground pipeline

Drip irrigation system

pronged approach was pilot tested in village Rasulpur Jattan of Sahapur block. Underground pipe conveyance, solar powered drip system and raingun system were installed in farmers' field to minimize conveyance loss and for precision irrigation. Groundwater resource was augmented through installation of artificial recharge structures (recharge cavity wells) along with check dams.

Two microbial consortia, viz. *Pseudomonas putida* P7 + *Bacillus subtilis* B30 (consortia 1) and *Pseudomonas putida* P45 + *Bacillus amyloliquefaciens* B17 (consortia 2) were developed for drought tolerance and enhancing crop productivity.

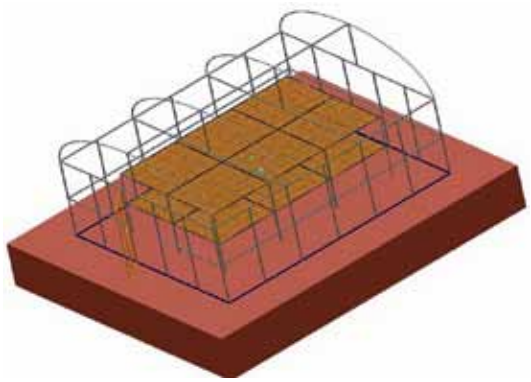
A medium duration high yielding rice genotype IET 24306 (Swarna Samriddhi Dhan) was identified for rainfed areas of Bihar. It is resistant to multiple stresses (drought, submergence, disease and insect pest) with desirable cooking quality traits and having long slender grain type.

New climate resilient rice genotype NICRA Aerobic Dhan-1 was developed.

Paddy

Milled rice

A solar smart tunnel drier of dimension 6×5 m was designed to have a capacity of drying 100 kg raw sliced turmeric/ ginger in 12 trays.



A 3D structural model of smart tunnel drier

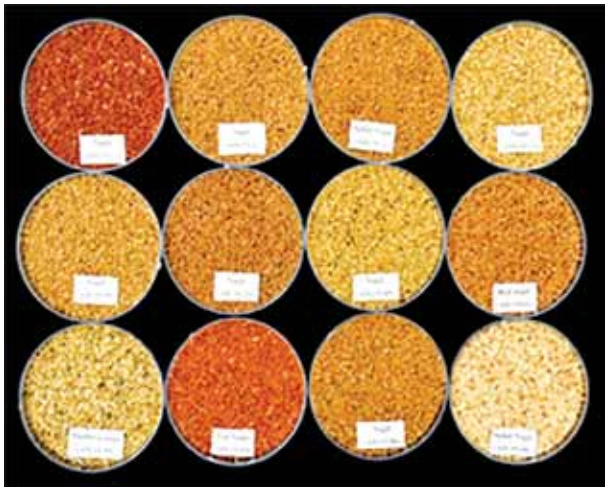
One oyster mushroom strain PL-19-04 was identified with biological efficiency of 96% after evaluation in low cost mushroom house.

Oyster mushroom strain (PL-19-04)

Genetic resources

A total of 25 explorations were undertaken and 1,764 accessions (1,368 cultivated and 396 wild) were collected from various states. During this year, 8,222 accessions of orthodox seed species were added to the National Gene Bank for long-term storage taking the total holding to 4,46,636 accessions. Screening against biotic (1,450 accessions), abiotic stresses (1130 accessions) and herbicide resistance (2000 accessions) was undertaken in different crops. A total of 1,24,152 samples were processed comprising germplasm accessions, nurseries/trial breeding material of various crops including both true seed and vegetative propagules for quarantine clearance. National Genomic Resources Repository conserved 6,447 genomic accessions of 45 species at both -70°C and -196°C. A total of 186 germplasm accessions of fruit crops were collected from 15 states and Union Territories. In vegetable crops, a total of 440 and in perennial spices, 43 germplasm accessions were collected from different states and Union Territories.

Seed variability in rice bean germplasm from Uttarakhand



Seed variability in foxtail millet from Gujarat

One stable, andro-monoecious sex form in watermelon (AHW/BR-5) with the ability to set fruits and produce viable seeds under net house conditions without pollinators and production of viable seeds was identified.

Thirteen new breeds of livestock and poultry and three breeds of dog were registered. The total number of indigenous breeds of livestock, poultry and dog are now 200.

Bawri cattle

Gojri buffalo

Kajali sheep

Purnea pig

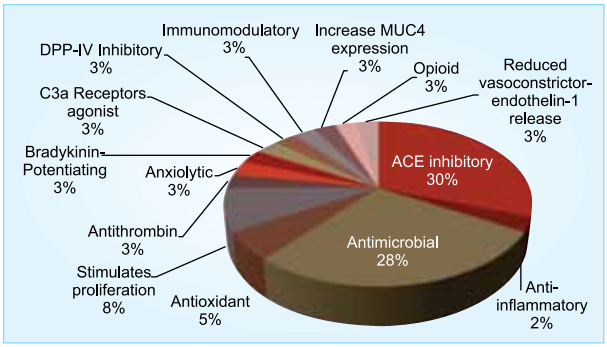
Kachchhi donkey

Maithili duck

Rajapalayam dog

Five indigenous livestock populations of Kathani cattle, Balangir goat and Marwari, Sindhi and Kharai camel were characterized using a panel of 25 microsatellite markers, specific for each species. Metabolic profile of serum samples of livestock species in Ladakh (Ladakhi cattle, Jersey cattle, Ladakhi donkey and Changathngi goat) adapted to high altitude was evaluated assessing complement systems-wide approach to elucidate the influence on these species.

The post translational modifications were observed in low and high abundant proteins of genetically diverse goat breeds/genotypes. High levels of PTMs were observed in 120 goat milk proteins.



The somatic cell bank was strengthened with fibroblast cell line from Jaisalmeri and Bikaneri camel, Halari donkey and Zanskari horse with at least five samples from each.

A new freshwater fish species, *Barilius torsai* from Torsa river, Brahmaputra drainage was identified.

Holotype of *Barilius torsai* (ZSI FF5542; 71.41 mm SL)

Crop improvement

During 2020-21, a total of 172 varieties/hybrids including 17 biofortified varieties were notified and released for commercial cultivation.

These high yielding varieties included 62 varieties of cereals, 23 of oilseeds, 33 of pulses, 39 of commercial crops, 15 of forage crops and other crops. Using marker-assisted selection strategy, lipoxygenase-2 free soybean variety NRC 132 was developed and identified for cultivation in Southern and Eastern zones.

Seventeen biofortified varieties of crops were dedicated to the nation by Hon'ble Prime Minister of India on the World Food Day

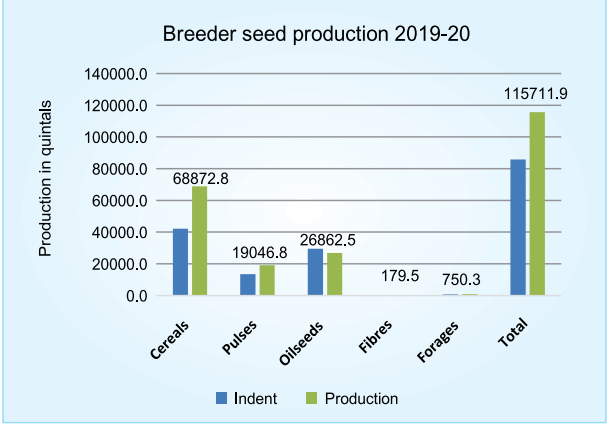
Lipoxygenase-2 free soybean variety 'NRC 132'.

Two SNP markers linked to wilt resistance in castor variety 48-1 were identified. These markers can be further used in the MAS for development of wilt resistant castor varieties. The miR156 binding site of the *Ideal Plant Architecture gene 1* (*IPA1*) was edited through CRISPR/Cas9 technique in Swarna rice.

The edited lines showed ~40% increase in number of the spikelet's per panicle. *Cicer microphyllum*, a wild relative of *C. arietinum*, may serve as a source of genes responsible for drought tolerance. During 2019-20, total breeders seed production in field crops was 115,711.9 q against the indent of 85,752.8 q. The cereal crops had a major share in total breeder seed production. During 2019-20, the total production of quality seeds including all classes was 420812.6 q against the target of 376,553.0 q.

Swarna | Swarna-IPA1-T_0-11-3 | Swarna | Swarna-IPA1-T_0-11-3

Editing of *miR156* in IPA1 gene for Ideal Plant Architecture in Swarna for rainfed shallow lowlands.



In horticultural crops during this year, a total of 65 improved varieties/hybrids comprising fruits (11), plantation crops (8), vegetables (22), onion (4), garlic (1), potato (9), tropical tubers (2), flowers (1), spices (3), medicinal plant (1) and mushrooms (3) were identified for cultivation in different agro-climatic conditions of India. A total of 258.96 q of Breeder's seed of 193 varieties and hybrids of different vegetable crops were produced. Further, as a part of technology dissemination, a total of 227.2 q truthful label seeds of 56 varieties/hybrids of vegetables and 226 q TL seeds of seed spices was produced and distributed to farmers.

In pummelo, Arka Chandra and Arka Anantha with high yield and suitability for fresh consumption were developed. Arka Supreme avocado having 370-400 kg fruit yield was developed.

Arka Chandra

Arka Anantha

Arka Supreme

Solapur Lal, the first biofortified hybrid pomegranate useful for juice or fresh consumption, was bred. ARI-516 grape, a high yielding, early ripening, evenly maturing hybrid with long, cylindrical, medium sized fruit bunches with 20-22 °Brix and musky flavor was developed. Thettu Amalika tamarind was identified for cultivation in semi-arid zone of Andhra Pradesh.

Tamarind 'Thettu Amalika' in various forms

The coconut varieties notified were Kalpa Haritha, Kalpa Jyothi, Kalpa Surya and Kalpa Srestha. VTLCP-9 cocoa is a promising hybrid with 3 kg dry beans/tree/year yield and suitable for chocolate industry.

Kalpa Haritha

Kalpa Jyothi

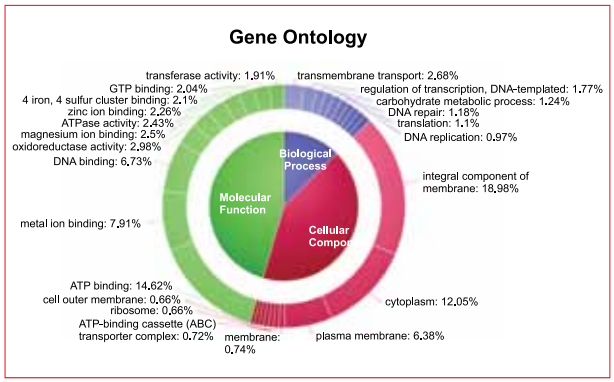
Kalpa Surya

Kalpa Sreshta

Two onion varieties, viz. Bhima Subhra and Bhima Safed were registered with PPV&FRA under extant category for their protection. Kashi Baingani French bean which flowers at 70-80 days after

sowing, has been identified for cultivation in Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Madhya Pradesh, Maharashtra, Goa and Karnataka. Promising onion hybrids identified were DOGR Hy-73, DOGR Hy-173 and DOGR Hy-179. White onion variety GJWO-3 was identified for cultivation during *rabi*.

Promising potato varieties identified were Kufri FryoM, Kufri Karan, Kufri Manik, Kufri Sahyadri, Kufri Thar-1, Kufri Thar-2, Kufri Thar-3, Kufri Sangam and Hybrid Kufri Chipsona-4. High yielding seed spices varieties developed were Ajmer Ajwain-73 and Ajmer Nigella-1. For the first time, a draft genome sequence of the popular Indian cashew cv. Bhaskara was generated using hybrid genome assembly approaches.



Livestock improvement

The cattle Frieswal was declared a breed and subsequently a trademark Frieswal™ was obtained. Frieswal, a crossbred cattle variety, was released and included as a breed in national milch herd. The total lactation milk yield of this breed is 3,628 kg.

Under the Field Progeny Testing (FPT) project, the increase since 1995 to 2019 in average first lactation 305 days milk yields of the Frieswal progenies and decrease in the average age at first calving (AFC) was recorded at various centres. Under the Indigenous Breeds Project (IBP), genetic improvements of three breeds, viz. Gir, Kankrej, and Sahiwal were carried out through the selection of elite animals. Under Mega Sheep Seed Project, the improvement of indigenous sheep breeds was carried out by propagation of superior germplasm in the farmers' flock.

A total of 345 improved goat germplasm of different breeds were supplied to farmers and different developmental agencies for improving production performance in field conditions. The follicular dynamics concerning the changes in concentrations of hormones during the estrous cycle in pubertal mithun was evaluated.

Two male lines of poultry, viz. PD-1 (Vanaraja male line) and PD-6 (Gramapriya male line) and two female lines, viz. PD-2 (Vanaraja female) and PD-3 (Brown egg layer line) were improved.

PD-6 adult birds

A total of five crosses were produced by crossing Aseel males with females of PD-1, PD-2, PD-6, PB-1, PB-2 lines and evaluated up to 12 weeks of age.

Aseel x PD-1 cross

2-way cross birds in the rural backyard

The indigenous ornamental fish, *channa stewartii,* collected from beels of Assam was raised to broodstock in concrete tanks. The complete technology of breeding and seed production of ornamental fish silver moony was developed and is ready for transfer and entrepreneurship development.

Captive breeding and seed production of an important food fish, mangrove red snapper was successfully undertaken, which not only is a suitable species for farming in brackish water ponds and open cages, but it also grows fast, tolerates salinity and accepts pelleted feed.

Mangrove red snapper, *Lutjanus argentima culatus* and its different stages of development

A portable fiberglass reinforced plastics (FRP) hatchery was designed and fabricated for pabda. It possesses the capacity to accommodate 45,000-50,000 fertilized eggs, which can produce 10,000-15,000 early fry in a single cycle.

By adopting multiple stocking and multiple harvesting (MSMH) farming models with milkfish, productivity could be increased in small and traditional ponds. In 180 days, this model yielded 3.0-3.8 tonnes/h fish with a benefit-cost ratio of 1.50-1.66.

Crop management

A decision support tool (APSIM) to design suitable crop management in sorghum interventions for locations and to optimize *rabi* sorghum systems productivity was developed. Simulation study indicated that refined APSIM setup with gridded NASA data could be successfully used to simulate the yields of *rabi* sorghum across the country. Work on organic farming (OF) in pulses especially in long duration pigeon pea showed that higher crop performance could be realized with OF *vis-a-vis* inorganic or recommended practice.

Intercropping of maize + cowpea (1:1) was most effective with higher grain yield of maize (66 q/ha) compared to that in maize – chickpea system (63.90 q/ha).

Maize + cowpea (1:1) intercropping at Dharwad (Peninsular India)

Crop intensification with foxtail millet as pre-*rabi* crop, is recommended in rainfed Alfisols of Prakasam district for an additional net income of ₹ 10,000 to 25,000/ha, where farmers normally grow tobacco and Bengal gram in *rabi*.

Maize-tobacco cropping system is recommended as remunerative cropping system in terms of tobacco leaf yield (2,380 kg/ha) and net returns (₹ 139,285) in tobacco growing Vertisols of Andhra Pradesh.

The maximum soybean yield was recorded under conventional tillage carried out after two years and

Maize–tobacco cropping system in Vertisols of Andhra Pradesh

remained at par with sub soiling once in four years and conventional tillage carried out every year. A novel rhizobial strain *Bradyrhizobium daqigense* was isolated for the first time from root nodules of soybean.

Five resources based farmer specific IFS models each of one ha size were developed and demonstrated by IGFRI, Jhansi to enhance the livelihood of Bundelkhand farmers.

View of water harvesting pond and rainfed IFS model

Trichoderma isolates from pulses rhizosphere were tested under *in vitro* and green house conditions at ICAR-IIPR, Kanpur; one isolate, 11PRTH-31 (*Trichoderma asperellum*) was identified for maximum inhibition of mycelial growth of wilt

Various stages of finger and neck blast infection and severity: (*a*) initial infection, one or more small lesion(s) on finger, (*b*) increase in lesion size, spikelets close to the lesion are affected, (*c*) drying of finger, proximal part of finger from the point of infection dries up, (*d*) initial infection on neck, (*e*) infection close to finger base, one or more fingers are affected, and (*f*) whole neck blasted, all fingers dead with unfilled grains.

pathogens, promoted root length, shoot length, and tolerated temperature up to 50°C. Blast pathogen *Pyricularia grisea* infect the spike or finger of finger millet at flowering stage. Yield loss due to this disease varies from 28-36% and may go up under favourable conditions for disease.

Multiple parasitoid species for biological control of fall armyworm identified were *Spodoptera frugiperda, Glyptapanteles creatonoti, Campoletis chlorideae, Cotesia ruficrus, Coccigidium transcapsicum, Chelonus formosanus* and Phanerotoma sp. Application of FYM (10 kg/tree) with Arka microbial consortium along with 100g AM fungi was observed effective in replacement of 25% of recommended dose of fertilizers in custard apple Arka Sahan. Fertigation of 75% NPK along with irrigation at 80% ER and polythene mulching in combination with foliar spray (2%) of micronutrient formulation Banana Shakti and bunch spraying with 2% potassium sulphate significantly enhanced the yield of banana in Karnataka, Odisha and Andhra Pradesh. In Grand Naine banana, the application of poultry manure + groundnut cake + rural compost + wood ash + VAM + PSB + KSB yielded bunches (23.5 kg) which were on par with 100% inorganically fertilized banana plants. At Shillong, application of 75% of recommended-Phosphorous (RDP) as rock phosphate along with PSB inoculation exhibited potato tuber yield at par with the treatment receiving 100% RDP indicating a saving of about 25% RDP. Soil application of liquid formulation of *Beauveria bassiana* along with bunch spraying with acephate

followed by bunch covering with polypropylene sleeve were found effective in management of banana scarring beetle.

Utility of genome editing of mango fruit fly mediated by CRISPR/Cas 9 was demonstrated by disrupting white gene, spermatogenesis pathway genes such as topi, per.

Integrated management of leaf curl virus in chilli Pusa Jwala was standardized with reduced incidence of leaf curl disease which increased yield by 78.61%.

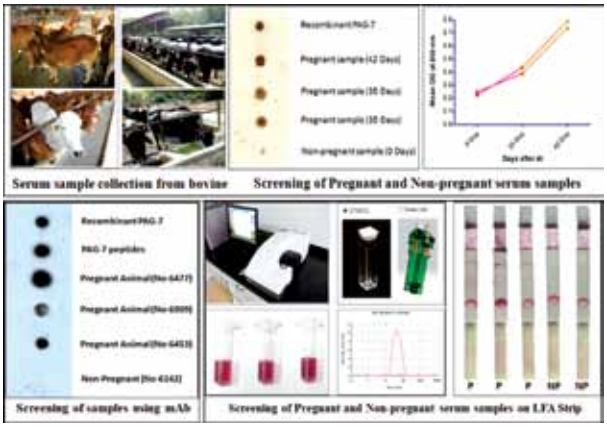
Livestock management

New variety of sorghum fodder, CSV-43 BMR developed through pedigree method improved the performance of growing and lactating buffaloes. A composite feed additive developed was effective in reducing enteric methane production and enhancing performance in lactating murrah buffaloes. A study indicated that Murrah buffalo males can grow faster, attain early puberty and AFE with better semen quality when provided with improved feeding and shelter management. Supplementation of *Tinospora cordifolia* stem powder @ 2% in concentrate feed for 14 days could prevent sub-acute lactic acidosis in small ruminants.

Studies revealed that treatment of cloned embryos with Dickkopf-1 improved their developmental competence, quality and live birth rate.

The growing goats and sheep fed with moringa based complete feed for long duration attained higher body weight and appreciably highest efficiency of feed conversion in comparison to other group of animals of similar age and fed with traditional ration.

A pregnancy associated glycoproteins-based diagnostic assay was developed for early detection of pregnancy in bovine.



Development of PAG based proof of concept for early detection of bovine pregnancy

Study under controlled thermal stress conditions in psychrometric chambers and in different seasons revealed that crossbred cattle are more immune to stress than indigenous cattle. A novel phytogenic blend was developed to replace antibiotic growth promoters in broiler production. Dietary supplementation of the bland significantly improved body weight gain and feed conversion ratio and reduced Salmonella and coliform counts in the caecum.

Two effective kits, namely Surravey-kit for population survey of Trypanosomiasis and indirect ELISA for detection of antibodies against Classical Swine Fever in pigs using recombinant Erns protein were developed and launched. A total of 6,100 pig and 25,599 small ruminant serum samples received

through AICRP-ADMAS centres were added to the National Livestock Serum Bank. An indigenous ELISA kit was developed to know the early presence of Rotavirus in diarrheic calves. Live attenuated CSF cell culture vaccine was developed from an indigenous strain. The vaccine will be highly cost effective and can be easily scaled up.

A study aimed at treating mastitis and metritis diseases in cattle by treatment with Mesenchymal stem cells (MSCs). All the animals were cured completely demonstrating the potential of MSCs for treatment of mastitis and metritis in cattle.

(a) Before treatment of mastitis with MSCs;
(b) 60 days after treatment with MSCs

Several incidences of LSD outbreaks in cattle were observed in five districts of Odisha during August 2019.

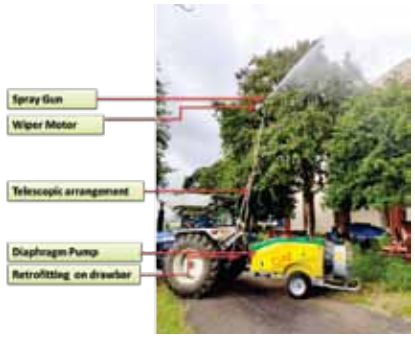
A PCR-based identification kit was developed which can identify magur and gariepinus and their hybrid in just two steps with genomic DNA as starting material. The full-length lgp2-cDNA sequence obtained through rapid amplification of cDNA ends-PCR consisted of 2,299 nucleotides with an open reading frame of 2,034 bp encoding 677 amino acids. To quantify the burden of antimicrobial resistance in food-producing animals and aquaculture through structured surveillance, ICAR in cooperation with FAO initiated a Network project known as Indian Network for Fisheries and Animal Antimicrobial Resistance (INFAAR). Lumiphage-a bacteriophage-based therapy as an alternative to antibiotics was developed for shrimp hatchery operators for the prevention and control of bacterial diseases. A medicated feed mix, CIFE-ARGUNIL, which is effective for the control and treatment of Argulus and other ectoparasites of fishes was developed and granted patent.

Mechanization and energy management

A tractor-mounted six-row high speed (5-7 km/h) planter was developed with the pneumatic metering mechanism. The approximate cost of the machine is ₹ 90,000 and cost of operation is ₹ 615/h. The breakeven point and payback period of the planter were 64.8h/year and 1.96 year, respectively.

High speed planter for soybean

The development of suitable matching equipment for the small tractor is of prime importance due to small fragmented land holdings, hill agriculture, shifting cultivation and lack of mechanization for the horticultural sector. The spraying system has been attached to the platform for the application of fungicide/pesticide. The developed system can be used in orchard crops for pruning, spraying and fruits plucking. One of the possible ways to increase the digestibility of poor quality roughages like rice and wheat straw is urea treatment. The handling task can be minimized substantially by treating straw with a retrofitted urea solution spraying system on the straw baler. The capacity of straw baler with urea spraying system is 109 bales/h for paddy at a straw load of 8.3 t/ha. A three-row multi-crop planter cum herbicide applicator was developed for planting of seeds and application of herbicide simultaneously. The performance of the implement was evaluated for the sowing of soybean, green gram and fodder maize crops. The cost of the implement is ₹ 15,000. A high-pressure variable range sprayer prototype was developed to control the hopper and adult locust.



High pressure variable range sprayer

Animal cart mounted solar sprayer

Sprayer equipped with electro-pneumatic system to control whitefly in cotton crop

Tractor operated planter for tissue

Power operated mini rhizome planter

Farm safety app

The other implements developed for farm mechanization were animal cast mounted solar sprayer, ultra-low volume spraying system, tractor operated intra row cum inter row weeder for orchards, sprayer equipped with electro-pneumatic system to control whitefly in cotton crop, tractor operated planter for tissue culture banana, dust separation system for the wheat straw combine, trimming mechanism type banana sucker pairing equipment, banana pseudo stem injector, tractor operated banana bunch harvester, cashew apple slicer, cleaner for multiplier onion, lifting platform for operations in green house, power-operated mini rhizome planter, power-operated groundnut stripper cum decorticator, dust protection mask, solar fan-assisted headgear for environmental heat stress, tubular condenser integrated bio-oil apparatus, solar-assisted micro-algae harvesting system and non-thermal Plasma pyrolysis reactor. A farm safety app was also developed by AICRP on ESA Center at CIAE Bhopal which provides information about agricultural accidents and their cause, precautions and safety gadgets for its preventions. Initiatives were undertaken to tackle the COVID-19 pandemic. The portable touch-free hand wash system, hand sanitizer unit and pedal-operated sanitizer dispensing unit were developed to prevent spread of COVID-19.

Post-harvest management and value-addition

Green pea is used as fresh, frozen, canned and in dried seed form. The shelling/de-poding of pea seeds from the matured pods is a requisite operation. A small to medium scale green pea de-poding machine was developed with a capacity of 45-55 kg/h, shelling efficiency of 90-95% and 2-3% damage. The on farm solar assisted dryer for drying groundnut pods was developed. After drying, the groundnut pods can be stored for a longer time. The other machinery developed for post-harvest management and value-addition were: primary makhana roasting machine, loading/unloading device, poultry processing cum by-product collection unit, automated amylose detection sensor system for assessment of ageing of rice grain, portable solar dryer for hills, portable ozone-based fruits and vegetables washer-cum-purifier/ portable smart ultraviolet-C disinfection system.

Loading / unloading device

Green pea depoder machine

Solar assisted dryer for drying groundnut pods

Automated amylose detection sensor system

Portable solar dryer for hill

Portable smart ultraviolet-C disinfection system (UV*i*C)

A novel process to produce protein isolates/ concentrates from oilseed cakes/meals without the addition of strong or diluted acid was developed. The protein produced using this method is superior in terms of solubility, wettability, water absorption capacity and degree of hydrolysis. A process for preparation of fat/oil free flavoured makhana was developed. Fat free flavoured makhana is useful for the health-conscious consumers. Testing kits for detection of adulterants in selected spices, e.g. turmeric powder, red chillies, black pepper, coriander etc. were developed based on biochemical tests. The kit contains chemicals, glassware and procedure for the detection of adulterants, viz. metanil yellow, lead chromate, sudan dye, rhodamine, starch and papaya seed powder in spices. The other processes and products developed were activated carbon from walnut hull, natural dye extracted from walnut hull, rose petal jam, soy based composite edible film, omega 3 rich flax seed and chia seed fortified eggless chocolate cake, cotton gin trash treatment system, cotton interlined sleeping bags for better comfort, agro-residue reinforced natural rubber garden pots, innovative lysimeter for on–farm water management, high value fine textiles from banana/ jute/regenerated cellulosic fibres, sorghum yoghurt, omega-3 fatty acid fortified butter, seaweed-based products etc.

Agricultural human resource development

The Education Division, ICAR, continues to strive for strengthening and quality assurance of higher agricultural education through implementation of scheme 'Strengthening and Development of Higher

Agricultural Education in India'. Quality assurance of AUs was ensured through accreditation and ranking of the AUs.

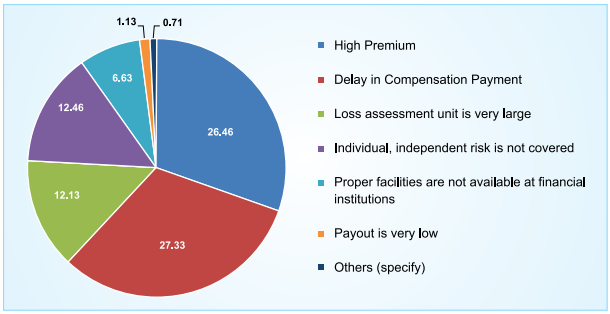
Capacity building of the students and faculties was enhanced in 16 programmes supported under Niche Area of Excellence including, one new programme sanctioned in 2019-20. Learning resources were enriched and strengthened with e-books/print books and ICT in all disciplines. Twenty new Experiential Learning Modules were supported under student 'READY' component for developing entrepreneurial skills of students. Financial support was also provided for strengthening, renovation and modernization of the structures pertaining to learning and teaching as well as for infrastructure pertaining to student amenities, viz. student hostels, laboratories, examination halls, smart classrooms. AUs were also supported for encouraging holistic development of students.

Various programmes/activities also facilitated promotion of higher agricultural education. These include centralized admissions in UG/PG and PhD to reduce academic inbreeding, infuse merit and promote national integration; award and distribution of fellowships to attract and retain the talent and promote merit, admission of foreign students for globalization of agricultural education, capacity building of faculty through summer-winter schools and Centre of Advanced Faculty Training, National Professorial Chairs and National Fellow Scheme for promotion of excellence in research, Emeritus Scientist/Emeritus Professor Schemes as a structural method of utilizing skill bank of outstanding superannuated professionals. The support for Girls' hostels, under the scheme of Agricultural Education Division was a step towards gender mainstreaming which increased the percentage of girls in higher agricultural education to 43.6%. The upgraded, improved and expanded infrastructure also increased the overall intake of the students across AUs.

The National Agricultural Higher Education Project (NAHEP) is becoming increasingly visible to have contributed towards transformation in agricultural higher education, enhancing its quality and relevance and development pursuit of the ICAR. The project implementation witnessed a desired pace during this year. By now, 58 Agricultural Universities across the country were awarded projects under different components of NAHEP. During the year, activities majorly focused on teaching and research infrastructure development, faculty development and training, networking and industry collaboration, vocational training, students job placement, own revenue generation, strengthening of teaching and research infrastructure etc. Till now, nearly 377 students and 120 faculties had undergone the international level trainings in reputed foreign universities, whereas more than 2000 national level workshops /seminars have been conducted for UG, PG and PhD level students under different components. Moreover, industry visits and Skill development programs have also been organized primarily to cater the current market needs and enable the students to emerge as "Job Creators" rather than "Job Seekers". During the period, activities undertaken are strengthening of key digital infrastructures of ICAR AU system such as ICAR – DC (Krishi Megh), e –enabled learning activities in AUs through demonstrations of virtual classrooms, implementation of Academic Management System in 52 AUs, development of AU – PIMS, progress on constitution of External Advisory Panel, technical committee meetings to catalyze the participation of state government representatives in raising the quality and relevance of agricultural higher education etc. So far, this program has benefited around 54,000 beneficiaries across agriculture and allied sector.

Social Science

The frequency of climatic hazards such as droughts, floods, heat waves and cold waves has increased in the recent past and is predicted to increase in the future, that will affect the performance of agriculture and livelihood of millions of people. In India, the climatic hazards are estimated to reduce agricultural growth by about one-fourth. Keeping in view the current resource constraints, particularly the water in the Bundelkhand region, sustainable cropping pattern, and crop-livestock mix were envisaged. A goal programming model was developed to maximize net returns and minimize water use with set of physical, economic and environmental constraints. A Composite agricultural sustainability indicator (CASI) was designed especially suitable for the rice-wheat production system. The index covers four broad dimensions, viz. soil, water, ecological and economic encompassing 79 indicators. The barometer so developed was applied to gauge the sustainability of Trans Gangetic plains of India. The trends in scientific publications of emerging technologies such as synthetic biology and artificial intelligence in agriculture were studied. Applications



Farmers' perception and awareness (Impact of governance in irrigation sector on agricultural productivity)

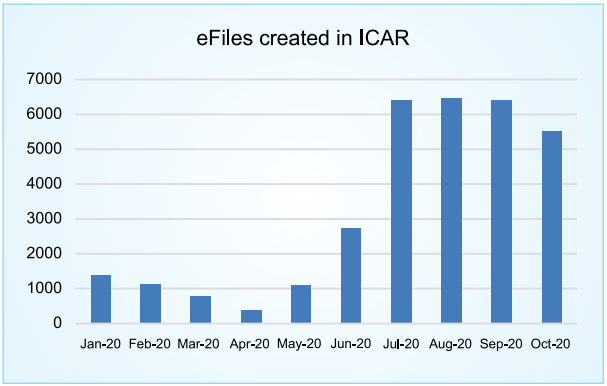
of these technologies such as deep learning and algorithms to predict diseases and pest outbreaks, genome editing for new improved varieties are already in the market. To study the functional nature of Extension and Advisory Services (EAS), a system level analysis was carried out with 36 service providers from Maharashtra and Odisha; including Public Private, Farmers' Producers Organizations (FPOs), and Non-Governmental Organizations (NGOs).

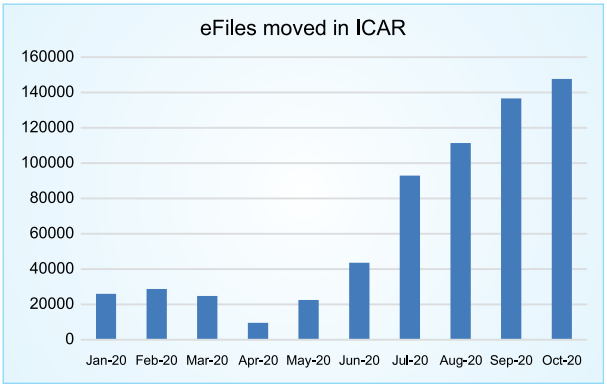
All public EAS providers reported linkages and cooperation with other public EAS providers as well as non-public EAS providers. The linkages among non-public EAS providers were not as expected; particularly, FPOs and some private EAS providers worked in isolation. The Government of India is committed to doubling of farmers' income (DFI) by 2022 with DFI strategies now under implementation. ICAR-NIAP estimated the interim growth rates in income for effective monitoring of DFI strategies. The income assessment was done using seven sources of growth. The real income growth was estimated from 2015-16 to 2018-19. The estimates are a positive direction of change. Several initiatives of the government are seen to be yielding positive results, and the growth momentum can be expected to pick up further. ICAR-Central Institute for Women in Agriculture (ICAR-CIWA) is an institution first of its kind in the world that is exclusively devoted to gender related research in agriculture.

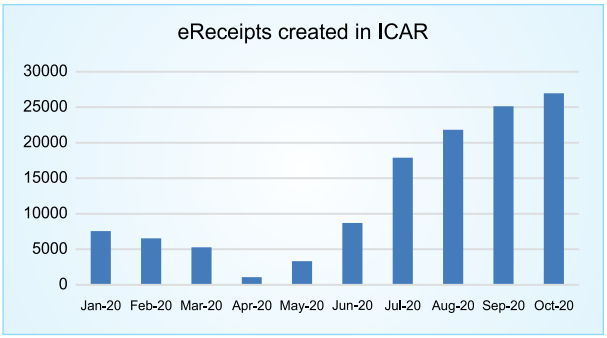
Information, communication and publicity services

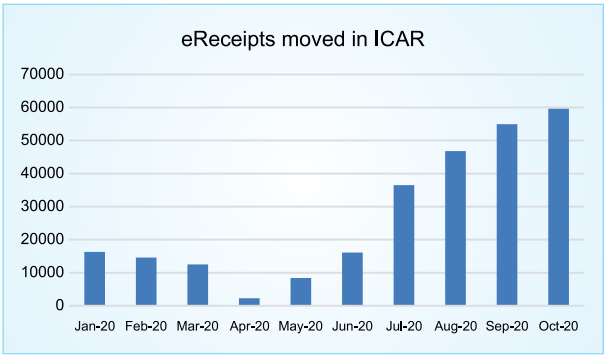
The ICAR-Directorate of Knowledge Management in Agriculture (DKMA) is mandated to showcase ICAR's technologies, policies and other activities through state-of-the-art dissemination methods that cater to various stakeholders in the field of agriculture. In the fast-changing knowledge intensive era, the DKMA is committed to promote ICT-driven technology and information dissemination system for quicker and more effective outreach. The ICAR-DKMA has already taken steps to disseminate knowledge by using up-to-date most popular ICT tools for benefitting the national as well as global agricultural world. *The Indian Journal of Agricultural Sciences* and *The Indian Journal of Animal Sciences*, the prestigious monthly research journals with international impact factors have been put on the open access mode (http://epubs.icar.org.in/ejournal). The popular periodicals like *Indian Farming* and *Indian Horticulture,* and *Kheti* and *Phal Phool* were brought out to disseminate up-to-date knowledge and technologies to the stakeholders involved in agricultural production and processing in the country.

To disseminate information in real-time, the ICAR website was updated on regular basis, and in total 3,965 pages were updated, with page-views from more than 200 countries. On ICAR Facebook, total 399 posts were published, and it has 2,20,207 followers. The YouTube Channel of ICAR has video films, animations, lectures/interviews by dignitaries and eminent scientists, proceedings of national and international events, etc. The Channel presently has 54,800 subscribers.





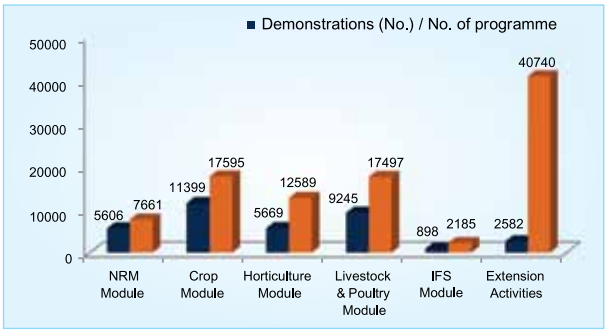




The ICT Roadmap of ICAR has been prepared for the development and implementation of various softwares, IT tools, databases and e-Governance software in line with the Digital India Mission of the country. This ICT Roadmap envisaged short term and long-term ICT/IT activities which are needed for undertaking ICT/IT projects based on disruptive ICT technologies such as precision agriculture, dynamic decision support and advisory system, e-Governance software using AI, DL, ML, blockchain and big data analytical techniques. In order to make paperless/environmental friendly office, e-office software has been implemented across 113 ICAR Institutes along with their Regional Stations/Sub-Stations in the country.

Technology assessment, demonstration and capacity development

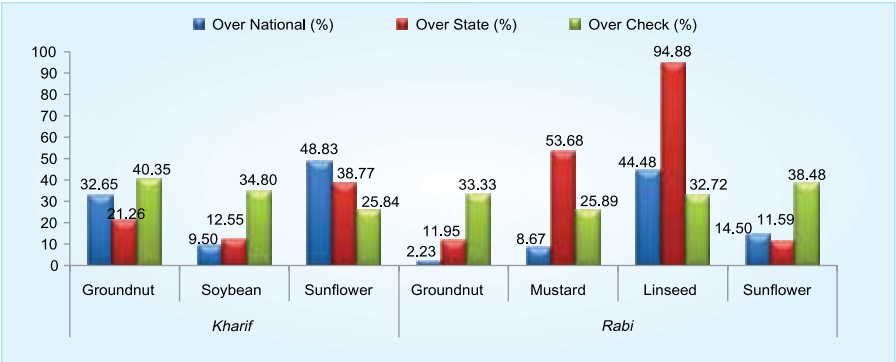
During the year, 12 new KVKs were established taking the total number of KVKs to 716 in the country. Besides lab-to-land activities for outreach, important programmes such as Farmers FIRST, Attracting and Retaining Youth in Agriculture (ARYA), Cluster Frontline Demonstration of Pulses and Oilseeds, Cereal Systems Initiatives for South Asia (CSISA), National Innovations in Climate Resilient Agriculture



Module-wise number of demonstrations / programme and number of farm familes under Farmer FIRST Programme

(NICRA), Pulses Seed Hubs, Mera Gaon Mera Gaurav and awareness creation on government schemes, etc. were taken up to address various challenges of engaging youth in agriculture, bringing self-sufficiency in the production of pulses and oilseeds, sustainable agriculture, etc.

Technology assessment is one of the main activities of KVKs to identify the location specificity of agricultural technologies developed by the National Agricultural Research System (NARS) under various farming systems. A total of 5,421 technologies of various crops were assessed at 13,094 locations by KVKs through 25,357 trials on farmers' field under thematic areas, namely cropping systems, drudgery reduction, farm machineries, integrated crop management, integrated disease management, integrated nutrient management, integrated pest management, integrated weed management, processing and value addition, resource conservation technologies, seed and planting materials production, storage techniques besides varietal assessment for cereals, pulses, oilseeds, fruits, vegetable crops and commercial crops. Under livestock, 1,034 technological interventions across 3,338 locations covering 5,156 trials on animals under the thematic areas of disease management, evaluation of breeds, feed and fodder management, nutrition management, production management, processing and value addition were



Yield advantage through CFLDs on oilseeds over national, state and check yield

taken up for assessment. The Indian Council of Agricultural Research, New Delhi initiated National Level Cluster Frontline Demonstration (CFLDs) on Pulses and Oilseeds with main objective to demonstrate the production potential of new varieties and the related technologies.

A total of 17.27 lakh farmers/farm women, rural youth and extension personnel were trained on various aspects through 57,879 training programmes. 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 benefitted 26.37 lakh farmers in the country. Soil, water, plant and manure samples brought by farmers were analyzed at KVKs, and suitable advisories based on analysis were provided to them. Soil health cards (4.56 lakh) were also issued to the farmers by KVKs. During the year, 5.81 lakh farmers visited ATICs for obtaining solutions related to their agricultural problems.

Research for tribal and hill regions

During the year, the following crop varieties were released and notified: VL Sweet Corn Hybrid 2, VL Masoor 148, VL Bhat 202 and VL Matar 61.

A total of 220.52 q breeder seed of 42 released varieties/inbreds of 15 crops was produced. The 15.18 q Truthfully Labelled (TL) seed of 25 varieties of 16 crops were produced. Sixty rice genotypes were evaluated for leaf and neck blast diseases under the Uniform Blast Nursery system. Four genotypes (VL 865U, A57, GSR 125 and GSR 142) for leaf and five genotypes (VL 3187, VL 31851, VL 31916, VL 31997 and GSR 132) for neck blast were found highly resistant, with 1 disease score on 0-9 scale. The susceptibility of greenhouse whitefly against different insecticides, viz. Thiomethaxam, Imidacloprid and Pymetrozine were high with LC_{50} values 12.30, 18.62 and 22:38 ppm, respectively. The brinjal accessions both cultivated and wild relatives were screened against the virulent strain Fom-Megh 1 isolated from Meghalaya. All cultivated varieties of brinjal, Pusa Bhairan, Pusa Shyamla, Pusa Uphar, Pusa Ankur and Pusa Purple Round were highly susceptible to Fom-Megh I in northeastern region. Dragon fruit cultivation has a huge potential in Mizoram as the climatic condition is highly suitable for better yield and quality with market demand. Shweta Kapila, a cattle breed from Goa was registered with ICAR-NBAGR, Karnal. The value-added formulation CCARI Bio 3 and CCARI Bio 4 was evaluated for their growth-promoting efficiency in the soil @ 50 g/m^2. Growth parameters were higher in the value-added formulation compared to untreated control. To improve the livelihood of the tribal farmers of Goa and coastal districts of Maharashtra and

VL Sweet Corn Hybrid 2

VL Bhat 202

VL Masoor 148

VL Matar 61

Karnataka farm and process machinery, technologies developed by ICAR-CCARI were distributed. Training and awareness required were also carried out for the capacity building of the farmers.

Organization and management

53 new Patent Applications were filed during this year in different subject domain of agricultural sciences at the Indian Patent Office (IPO). The cumulative figure of patent applications at ICAR has now risen to 1,172 applications. To protect the plant varieties, proposals for 45 varieties (24 extant and 21 new varieties) were filed at Plant varieties and Farmers' Rights Authority (PPV&FRA). For applications filed earlier, 54 varieties (43 and 11 new) were granted registration certificates during this period, which raised the cumulative figure of registered varieties to 900. Thirty seven trademark applications were filed by eight ICAR institutes for different products and processes. Till date a total of 168 trademark applications have been filed. This year, 325 partnership agreements were formed for Consultancy/Contract Research and Service with 174 public and private organizations.

Under the promotion quota following posts were filled up during this year, five Director/ Joint Director cum Registrar, one Director (F)/ Comptroller, one Deputy Director (F)/Chief Finance & Accounts Officer, three Deputy Secretary & three Chief Administrative Officer, eleven Senior Finance & Accounts Officer, three Under-Secretaries, five Senior Administrative Officer, three Deputy Director (OL), one Principle Private Secretary, ten Administrative Officer, nine Finance & Accounts Officer, three Section Officers and two Private Secretary. During the year, 69 eligible officers and staff of ICAR (Hqrs.) and Institutes were granted the benefits of financial up-gradation under the Modified Assured Career Progression scheme in accordance with the Government of India (Department of Personnel and Training) instructions in this regard.

Signing of MoA for licensing 12 coconut varieties of ICAR-CPCRI to M/s. LA FERME DE PETER LLP, Tirunelveli District, Tamil Nadu

Transfer of technology of 'Misti Doi with Fast Acidifying high sugar tolerating lactic culture (s)' to VRS foods Limited, New Delhi

During the period under report, 4 ICAR Institutes/ Centres were notified in the Gazette under office Language Rule 10(4). Till date, 141 ICAR institutes/ centres have been notified. Four meetings of the Official Language Implementation Committee were organized. In most of the ICAR institutes/centres, the Official Language Implementation Committee was constituted, and their meetings were being conducted regularly. The quarterly progress report was sent online to the Regional Implementation office of Rajbhasha Department. The quarterly progress reports received from various institutes were reviewed and suggestions were given to them for effective implementation. In accordance with the instructions/orders of the official Language Department, Ministry of Home Affairs, a total of 11 institutes were inspected for assessing the progress of Hindi during the period under report and suggestions were given to rectify shortcomings observed during the inspection.

Two meetings of Directors of ICAR institutes and ATARIs were held under the Chairmanship of Secretary, DARE and DG, ICAR through Video Conferencing during COVID-19 period. It was emphasized to strictly follow lockdown guidelines, maintain hygiene, use of mask and social distancing under any circumstances. Besides these, various action points regarding the research protocols to be developed and observed were decided. It was decided to ensure the technology and input delivery among the farmers and other stakeholders using ICT and all other possible means were decided to minimize the impact of COVID-19 on farmers and the agricultural sector. The Umbrella Memorandum Understanding (UMoU) was signed between the ICAR and host Institutions, i.e. Central/States Agricultural Universities and other Departments to

cooperate in conducting research through AICRPs/ Revolving Fund Scheme/ and any other such schemes funded/ sanctioned by the Council. To commemorate the 92nd Foundation Day of ICAR, the Award Ceremony was organized. Various Awards at ICAR Awards 2019 were presented to the winners on the occasion. The awards were given in 20 different categories to 161 awardees, these comprised 94 scientists, 10 administrative personnel, 6 journalists and 31 farmers. Two institutes, one university, two AICRPs and 14 KVKs were also awarded.

Partnership and linkages

ICAR works closely with the Consultative Group on International Agricultural Research (CGIAR) institutes. ICAR/DARE has strong collaboration in the field of agricultural research and capacity building through active MoUs and work plans with 12 out of 15 CGIAR institutes. During 2020-21, ICAR entered into a work plan agreement with the International Fertilizer Development Center (IFDC), Alabama,USA. Work Plan for the period 2020-25 was signed between ICAR and the International Food Policy Research Institute (IFPRI) to promote and accelerate the collaborative efforts for research and training in food and agricultural policies. To foster the agricultural research in the Global South, an MOU has been signed between ICAR and Asia Pacific Association of Agricultural Research Institutions (APAARI), Bangkok, Thailand. The ICAR has been pioneering in the human resources development for agricultural research in Afghanistan by establishing the Afghan National Agricultural Sciences and Technology University (ANASTU) at Kandahar. The significant improvement in the expansion and infrastructure development of CAUs happened during 2020 with Hon'ble Prime Minister dedicating the new building of the School of Agribusiness and Rural Management of RPCAU, Pusa, Samastipur and academic building for College of Agriculture, Horticulture and Forestry, administrative building, hostels and faculty residences at RLBCAU, Jhansi.

Shri Narendra Modiji, Hon'ble Prime Minister of India, dedicated the newly constructed Academic and Administrative buildings to the nation. As a measure to reach out to cross-sectional agencies and entities involved in the development of agriculture and the farmers in the country, ICAR entered into MoUs with the National Cooperative Development Corporation (NCDC), New Delhi; Indian Farmers Fertilizers Cooperative (IFFCO), New Delhi; Ministries of MSME for entrepreneurial development; and MoFPI for technical support and capacity building in food processing and promotion of one-district one product programme of Government of India. Agrinnovate India Limited has successfully been able to turn a new leaf in the recent past by initiating effective partnerships with ICAR institutes and private companies.

The company's revenue from operations touched ₹1,53,76,950 for the first time, as against ₹30,57,630 during the previous year. With a revamped website and increased efforts at bringing technologies developed by 35 ICAR institutes under AgIn's purview, nearly 340 technologies were added to the list of technologies ready for commercialization through AgIn.

Training and capacity building

As a new initiative, the Competent ICAR Institutes organized Trainers Development Programme for Developing Masters' Trainers in ICAR, training programme for Technical and/ or Administrative staff dealing with Security or Security Officer, Court cases, Assets Management,Works/Estate/Building Maintenance, Capacity Building Programme for CJSC Members and establishment matters for LDCs and UDCs of ICAR. Training programmes for Guest House Caretakers/Incharges, stenographers grade, technical staff, regular drivers, farm manager, PME Cell Incharges, ITMU/ZTMU Incharges, Vigilance Officers, etc. were also organized. An Executive Development Programme on 'Developing Effective Organizational Leadership for Senior Officers of ICAR' was also organized in which 45 Seniors Officers in 2 batches with both In-country and International exposure visits, participated.

All the ICAR-Institutes and HQ submitted the ATP online for all the categories of employees through TMIS. During the reporting period, 1,055 scientists; 728 technical; 1,321 administrative including finance staff and 340 Skilled Support Staff (SSS) were trained.

TMIS is an in-house developed online software that is being managed by HRM Unit, ICAR HQs and ICAR-IASRI, New Delhi. Overall, 3,444 employees were trained which is about 20.1% of the total employees' strength of ICAR. Compared to 2013-14, there was considerable improvement in a number of employees who received trainings particularly in case of Technical, Administrative and SSS, where improvement was 96.8, 118.0 and 750.0%, respectively along with the overall improvement of 43.0% in all the categories of employees. Compared to 2013-14, ICAR-Institutes/ HQs organized 67.2 and 440.0% more training programmes for technical and SSS, respectively with overall 4.1% higher trainings during 2019-20. ICAR-Institutes had also organized the Field/ Exposure visit of 288 SSS to other ICAR-Institute(s) within or nearby states.

For the first time, a study conducted on the effectiveness of trainings attended by 1,782 staff of all four categories during 2017-18 revealed that pooled perceived training effectiveness index (PTEI) was 3.86, referring medium effectiveness of trainings. Significant behavioural changes and changes in practices as a consequence of exposure to the trainings were observed and it was concluded that the trainings organized by ICAR should continue for all staff to bring desirable changes in competencies.

Improvement in capacity building of ICAR employees since creation of HRM Unit

SMD-wise number of employees undergone training

SMDs/HQs	No. of employees trained					% employees trained				
	Scientist	Tech.	Admin	SSS	Total	Scientist	Tech.	Admin	SSS	Total
Crop Sciences	274	260	343	94	971	16.2	18.7	40.6	7.1	82.6
Horticultural Sciences	155	108	181	86	530	21.2	15.7	46.9	15.2	99.0
NRM	151	125	159	34	469	19.0	12.6	38.0	5.7	75.3
Agricultural Education	30	22	63	23	138	20.8	23.4	59.4	39.7	143.3
Agricultural Engg.	39	21	82	18	160	19.9	8.0	59.9	15.1	102.9
Animal Sciences	203	102	185	48	538	26.9	13.5	37.9	4.0	82.4
Fisheries Sciences	166	76	165	37	444	27.5	15.2	55.4	9.4	107.6
Agricultural Extension	11	8	35	0	54	31.4	30.8	58.3	0.0	120.5
ICAR HQs	26	6	108	0	140	20.8	23.4	59.4	39.7	34.3
Total	**1,055**	**728**	**1,321**	**340**	**3,444**	**21.0**	**15.2**	**43.1**	**7.9**	**20.1**

03

DARE INTERNATIONAL COOPERATION ACTIVITIES

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 area 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 Memorandum of Understanding (MoUs)/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 this 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.

CG 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.

India is a donor member country to CGIAR from decades and also a voting member in CGIAR System Council, representing South Asia Constituency of the Council alongwith two alternate partner countries, viz. Bangladesh and Sri Lanka. India has assumed important role in CGIAR System as a permanent voting member. This responsibility requires reciprocation from India also. Accordingly, it contributes to CGIAR System through budget provisions of DARE/ICAR.

CGIAR science is dedicated to reducing poverty, enhancing food and nutrition security, and improving natural resources and ecosystem services. Its research is carried out by 15 CGIAR centers in close collaboration with hundreds of partners, including national and regional research institutes, civil society organizations, academia, development organizations and the private sector. Out of these 15 Centres, ICAR/DARE has strong collaboration in the field of agricultural research, education and capacity building with the following twelve CG Centres/Institutes;

- **ICRISAT: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)** conducts agricultural research for development in the drylands of Asia and sub-Saharan Africa to empower the poor people to overcome poverty, hunger and a degraded environment through better agriculture. It is headquartered at Hyderabad, Telangana. The remaining CGIAR research organizations have headquarters elsewhere but have strong presence in India in the form of a country or South Asia representative offices in India.

List of CGIAR Centers

Name of the Institutes	Headquarters
International Rice Research Institute (IRRI)	Manila, Philippines
International Food Policy Research Institute (IFPRI)	Washington, USA
International Wheat and Maize Improvement Centre (CIMMYT)	Mexico
International Centre for Agricultural Research in Dry Areas (ICARDA)	Aleppo, Syria
International Centre for Research in Agroforestry (ICRAF)	Nairobi, Kenya
International Water Management Institute (IWMI)	Colombo, Sri Lanka
International Livestock Research Institute (ILRI)	Nairobi, Kenya
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)	Telangana, India
Bioversity International	Rome, Italy
World Fish Centre (WFC)	Penang, Malaysia
International Potato Centre (CIP)	Lima, Peru
International Center for Tropical Agriculture	Colombia

- **CIMMYT: The International Maize and Wheat Improvement Center (CIMMYT)** known by its Spanish acronym CIMMYT for *Centro International de Mejoramiento de Maíz y Trigo* is a non-profit research-for-development organization that develops improved varieties of wheat and maize with the aim of contributing to food security, and innovates agricultural practices to help boost production, prevent crop disease and improve smallholder farmers' livelihoods. CIMMYT is known for hosting the world's largest maize and wheat genebank at its headquarters in Mexico.

  CIMMYT contributes to the development of a world with healthier and more prosperous people — free from the threat of global food crises — and with more resilient agri-food systems. The CIMMYT strategic plan 2017-2022 sets out an integrated approach of excellent science for impact, carried out by partnerships with strong emphasis on capacity building to fulfill CIMMYT's mission to improve livelihoods through maize and wheat science.

- **IRRI: The International Rice Research Institute (IRRI)** is an international agricultural research and training organization with headquarters in Los Baños, Laguna in the Philippines. IRRI is dedicated to abolishing poverty and hunger among people and populations that depend on rice-based agri-food systems. IRRI's aim is to improve the health and welfare of rice farmers and consumers; promote environmental sustainability in a world challenged by climate change; and support the empowerment of women and the youth in the rice industry.

- IRRI's research for development is characterized by its collaborative nature: from alliances with advanced research institutes; through strong collaborations and capacity development with governments and national agricultural research and extension systems; to partnerships with the development sector and our ability to broker novel delivery channels through the private sector. Their work is supported by a diverse network of investors aligned to common goals.

- **CIP: The International Potato Center (CIP)** was founded in 1971 as a research-for-development organization with a focus on potato, sweet potato and andean roots and tubers. It delivers innovative science-based solutions to enhance access to affordable nutritious food, foster inclusive sustainable business and employment growth, and drive the climate resilience of root and tuber agri-food systems. Headquartered in Lima, Peru, CIP has a research presence in more than 20 countries in Africa, Asia, and Latin America. CIP delivers innovative science-based solutions to enhance access to affordable nutritious food, foster inclusive sustainable business and employment growth, and drive climate resilience of root and tuber agri-food systems.

- **ICARDA: The International Center for Agriculture Research in the Dry Areas (ICARDA)** a member of the CGIAR, supported by the CGIAR Fund, is a non-profit agricultural research institute that aims to improve the livelihoods of the resource-poor across the world's dry areas.

- ICARDA is undertaking research-for-development and provide innovative, science-based solutions for communities across the non-tropical dry areas. In partnership with research institutions, NGOs, governments, and the private sector, our work advances scientific knowledge, shapes practices, and informs policy. Since its establishment in 1977, ICARDA has implemented research-for-development programs in 50 countries across the world's dry areas - from Morocco in North Africa to Bangladesh in South Asia.

  ICARDA envisions thriving and resilient livelihoods in the dry areas of the developing world with adequate incomes, secure access to food, markets, and nutrition, and the capacity to manage natural resources in equitable, sustainable, and innovative ways.

- **ICRAF:** The World Agroforestry (a brand name used by the **International Centre for Research in Agroforestry, ICRAF)**, is an international institute headquartered in Nairobi, Kenya, and founded in 1978 as "International Council for Research in Agroforestry". The centre specializes in the sustainable management, protection and regulation of tropical rainforest and natural reserves. It is one of 15 agricultural research centres which makes up the global network known as the CGIAR.

  ICRAF is a centre of science and development excellence that harnesses the benefits of trees for people and the environment with a vision

to equitable world where all people have viable livelihoods supported by healthy and productive landscapes. ICRAF mission is to harness the multiple benefits that the trees provide for agriculture, livelihoods, resilience and the future of our planet, from farmers' fields through to continental scales.

ICRAF is the only institution that does globally significant agroforestry research in and for all of the developing tropics. Knowledge produced by ICRAF enables governments, development agencies and farmers to utilize the power of trees to make farming and livelihoods more environmentally, socially and economically sustainable at scales.

- **IFPRI: The International Food Policy Research Institute (IFPRI)** is an international agricultural research center founded in the early 1970s to improve the understanding of national agricultural and food policies to promote the adoption of innovations in agricultural technology. It carries out food policy research and disseminates it through hundreds of publications, bulletins, conferences, and other initiatives.

  Additionally, IFPRI was meant to shed more light on the role of agricultural and rural development in the broader development pathway of a country. The mission of IFPRI is to provide research-based policy solutions that sustainably reduce poverty and end hunger and malnutrition.

- **ILRI: International Livestock Research Institute (ILRI)** is an international agricultural research institute based in Nairobi, Kenya, and founded in 1994 and focuses its research on building sustainable livestock pathways out of poverty in low-income countries. ILRI works with partners worldwide to help poor people keep their farm animals alive and productive, increase and sustain their livestock and farm productivity and find profitable markets for their animal products.

  ILRI's research addresses seven global livestock development challenges including vaccine and diagnostic technologies for orphan animal diseases, animal genetic resources, climate change – adaptation and mitigation, emerging diseases, SPS and market access within broader market opportunities for the poor, sustainable intensification in smallholder crop-livestock systems and vulnerability of marginal systems and peoples.

- **IWMI: The International Water Management Institute (IWMI)** is a non-profit research organization with headquarters in Colombo, Sri Lanka, and offices across Africa and Asia. Research at the Institute focuses on improving how water and land resources are managed, with the aim of underpinning food security and reducing poverty while safeguarding vital environmental processes.

  Its research focuses on water availability and access, including adaptation to climate change; how water is used and how it can be used more productively; water quality and its relationship to health and the environment; and how societies govern their water resources.

- IWMI is a member of CGIAR, and is also a partner in the CGIAR Research Programs on Aquatic Agricultural Systems (AAS); Climate Change, Agriculture and Food Security (CCAFS); Dryland Systems; and Integrated Systems for the Humid Tropics.

- **Bioversity International and CIAT Alliance:** The Alliance of Bio-diversity International and CIAT delivers research-based solutions that harness agricultural biodiversity and sustainably transform food systems to improve people's lives in a climate crisis. Alliance brings a dynamic, new and integrative approach to research for development, addressing the food system as a whole.

The alliance delivers research-based solutions that harness agricultural biodiversity and sustainably transform food systems to improve people's lives. To do so, the alliance works with local, national and multinational partners across Latin America and the Caribbean, Asia and Africa, and with the public and private sectors. With partners, the alliance generates evidence and mainstreams innovations in large-scale programmes to create food systems and landscapes that sustain the planet, drive prosperity and nourish people.

Activities Carried out with CGIAR System and its Centres

Work Plan approved and signed in the field of agricultural research & education

- Work Plan for the period 2020-25 between Indian Council of Agricultural Research (ICAR) and International Food Policy Research Institute has been signed on 1 May, 2020. Work-plan (2020-25) has been developed in accordance with the Article III of the MoU

signed between ICAR and IFPRI in 1988 and for keeping with their desire to promote and accelerate the collaborative efforts for research and training in food and agricultural policy.

Foreign visit of Secretary (DARE) & Director General (ICAR) and DARE Officers:

Secretary, DARE & DG, ICAR and Shri A.R. Sengupta, Deputy Secretary (Estt. & IC), DARE, Krishi Bhawan, New Delhi participated in the 9th CGIAR System Council Meeting held in Chengdu, China during 13-14 November 2019.

Foreign visit of ICAR Scientists

Dr Sunil Kumar Ambast, Director, ICAR-IIWM, Bhubaneswar participated the 3rd World Irrigation Forum and participated in the training workshop on Online Irrigation Bench Marking Services (OIBS) and Systematic Asset Management System (SAMS) during 01- 04 September, 2019 (excluding journey time) held in Indonesia.

Dr Ashok Kumar Singh, DDG (Agril. Extn.), ICAR Hqrs., New Delhi participated in the regional partners meet and 5th Global Science Conference on Climate-Smart Agriculture 2019 titled "Transforming food systems under a changing climate" during 06-10 October, 2019 (excluding journey time) held in Indonesia.

Dr S K Chaudhari, Assistant Director General (S&WM), ICAR, New Delhi participated in the 3rd World Irrigation Forum and chaired a Session in Workshop on "Online Irrigation Bench Marking Services (OBMS) and Systematic Asset Management System (SAMS)" in Indonesia during 01- 04 September, 2019 (excluding journey time).

Dr Devendra Kumar Yadav, Assistant Director General (Seed), ICAR, New Delhi participated in the International Seed Conference and Expert Consultation from 3-4 September 2019 (excluding journey period) held in Kathmandu.

Dr P S Brahmanand, Principal Scientist, ICAR-Indian Institute of Water Management (IIWM), Bhubaneswar participated in the regional partners meet (from 6-7 October, 2019) and 5th Global Science Conference on Climate-Smart Agriculture 2019 titled "Transforming food systems under a changing climate" (from 08-10 October, 2019 (excluding journey time) held in Indonesia.

Dr Y G Prasad, Director, ICAR-Agricultural Technology Application Research Institute [ATARI], Zone-X, Hyderabad participated in the regional partners meet (from 6-7 October, 2019) and 5th Global Science Conference on Climate-Smart Agriculture 2019 titled "Transforming food systems under a changing climate" (from 08-10 October, 2019 (excluding journey time) held in Indonesia.

Dr H C Prasanna, Principal Scientist, ICAR-Indian Institute of Horticultural Research (ICAR-IIHR), Bengaluru participated in the International Seed Conference and Expert Consultation from 3-4 September, 2019 (excluding journey period) in Kathmandu.

Dr S Bhaskar, ADG (AAF&CC), ICAR, New Delhi attended 5th Global Science Conference on Climate Smart Agriculture-2019 titled "Transforming food Systems under a changing climate" from 6-10 October, 2019 (excluding journey period) held in Indonesia.

Dr Sujay Rakshit, Director, ICAR-Indian Institute of Maize Research (IIMR), Ludhiana participated in the Annual review and planning meeting of the project "Heat Tolerant Maize for South Asia (HTMA)" during 26-28 September, 2019 (excluding journey time) in Nepal.

Dr Shyam Bir Singh, Principal Scientist, ICAR-Indian Institute of Maize Research (IIMR), Ludhiana participated in the Annual review and planning meeting of the project "Heat Tolerant Maize for South Asia (HTMA)" during 26-28 September, 2019 (excluding journey time) in Nepal.

Dr Pinky Raigond, Scientist, ICAR- CPRI, Shimla participated in the training course on "Procedure for sampling and sample preparation for mineral and bio-fortification analyses as well as measuring of vitamin C and glycoalkaloids" from 23/09/2019 to 02/10/2019 (excluding journey period) in Lima, Peru.

Dr Sanjeev Sharma, Principal Scientist, ICAR-Central Potato Research Institute, Shimla, participated in the 3rd Asia Blight International Conference during 22-31 October 2019 (excluding journey period) in Beijing, China.

Dr Narendra Pratap Singh, Director, ICAR-Indian Institute of Pulses Research (IIPR), Kanpur participated in Data Management Review, Planning and Training Workshop of BMS during 09-11 October, 2019 (excluding journey time) held in Ethiopia.

Dr Archana Singh, Principal Scientist, ICAR-Indian Institute of Pulses Research (IIPR),

Regional Station, Bhopal participated in the Data Management Review, Planning and Training Workshop of BMS during 09-11 October, 2019 in Ethiopia and International Training course on "Breeding approaches for enhancing genetic gains in GLDC" during 10-18 October 2019 (excluding journey period) held in Tanzania.

Dr (Ms.) Divya Ambati, Scientist, Division of Plant Breeding, ICAR-Indian Agricultural Research Institute (IARI), Regional Station, Indore participated in the Stem Rust Training Course during 05-13 October, 2019 (excluding journey period) held at Njoro, Kenya.

Dr R Madhusudhana, Principal Scientist, ICAR-Indian Institute of Millets Research (IIMR), Hyderabad participated in the Data Management Review, Planning during 09-11 October, 2019 (excluding journey time) held in Ethiopia.

Dr Vinay Bhardwaj, Principal Scientist, CPRI, Shimla participated in the training course on "Development of diploid potatoes" from 14-25 October, 2019 (12 days, excluding journey period) held in Lima, Peru.

Dr Vilas A Tonapi, Director, ICAR-Indian Institute of Millets Research (IIMR), Hyderabad participated in the Data Management Review, Planning and Training Workshop of Breeding Management System (BMS) during 09-11 October, 2019 (excluding journey time) held in Ethiopia.

Dr S K Chakrabarti, Director, ICAR-Central Potato Research Institute (CPRI), Shimla participated in the Regional Congress `Root and Tuber Crops for Food Security and Climate Change Resilience in Asia' during 17-18 October, 2019 (excluding journey period) held in Philippines.

Dr Radhakrishnan T., Director, ICAR-Directorate of Groundnut Research, Junagadh, Gujarat participated in the "International Workshop on Groundnut Bacterial Wilt Working Group and Cooperative Projects Reviewing during 18-20 October 2019 (excluding journey period) held in China.

Dr. Ram Dutta, Principal Scientist, ICAR-Directorate of Groundnut Research, Junagadh, Gujarat participated in the "International Workshop on Groundnut Bacterial Wilt Working Group and Cooperative Projects Reviewing during 18-20 October 2019 (excluding journey period) held in China.

Dr Radhakrishnan T., Director, ICAR-Directorate of Groundnut Research, Junagadh, Gujarat participated in the "International Workshop on Groundnut Bacterial Wilt Working Group and Cooperative Projects Reviewing during 18-20 October 2019 (excluding journey period) held in China.

Dr Vineet Bhasin, Principal Scientist, Animal Science Division, Indian Council of Agricultural Research, Krishi Bhawan, New Delhi participated in the science exchange visit during 21-26 October, 2019 (excluding journey period) held in Nairobi .

Dr Principal Radhakrishnan T, Director, ICAR-Directorate of Groundnut Research, Junagadh, Gujarat participated in the 11th International Conference on Advances in Arachis through Genomics and Biotechnology 2019 (AAGB2019) during 21-25 October 2019 (excluding journey period) held in China.

Dr Om Parkash Yadav, Director, CAZRI, Jodhpur participated in CGIAR Research Program on Grain Legumes and Dryland Cereals (CRP-GLDC) Science Meeting during 25-30 November, 2019 (excluding journey time) held in Nairobi, Kenya.

Dr C Tara Satyavati, Principal Scientist, Project Coordinator (Pearl Millet) All India Coordinated Research Project on Pearl Millet (AICPMIP), Jodhpur, Rajasthan attended the CGIAR Research Program on Grain Legumes and Dryland Cereals (CRP-GLDC) Science Meeting 2019 during 25-30 November, 2019 (excluding journey period) to be held in Kenya.

Dr. Narendra Pratap Singh, Director, ICAR-IIPR, Kanpur participated in CGIAR Research Program on Grain Legumes and Dryland Cereals (CRP-GLDC) Science Meeting during 25-30 November, 2019 (excluding journey time) held in Nairobi, Kenya.

Dr Uma Sah, Principal Scientist, ICAR-Indian Institute of Pulses Research (IIPR), Kanpur participated in CGIAR Research Program on Grain Legumes and Dryland Cereals (CRP-GLDC) Science Meeting during 25-30 November, 2019 (excluding journey time) held in Nairobi, Kenya.

Dr Vilas A Tonapi, Director, IIMR, Hyderabad participated in CGIAR Research Program on Grain Legumes and Dryland Cereals (CRP-

GLDC) Science Meeting during 25-30 November, 2019 (excluding journey time) held in Nairobi, Kenya.

Dr Sanjeev Gupta, Principal Scientist, ICAR-Indian Institute of Pulses Research, Kanpur participated in CGIAR Research Program on Grain Legumes and Dryland Cereals (CRP-GLDC) Science Meeting during 25-30 November, 2019 (excluding journey time) held in Nairobi, Kenya.

Dr Pradip Dey, Principal Scientist & Project Coordinator, ICAR-Indian Institute of Soil Science (IISS), Bhopal participated in the project consortium meeting during 2-6 December, 2019 (excluding journey period) held in Wageningen, The Netherlands.

Dr Raghavendra Bhatta, Director, ICAR-NIANP, Bengaluru attended meeting on ICAR-ILRI Collaboration on Green House Gas Emissions from 01-06 December 2019 (excluding journey period) held in Nairobi, Kenya.

Dr Arun Kumar Handa, Principal Scientist, Central Agroforestry Research Institute (CAFRI), Jhansi attended a high level consultation meeting on "Need, Role, and Potential of Agroforestry Policy" during 19-20 December, 2019 (excluding journey period) held in Hanoi, Vietnam.

Dr P Revathi, Senior Scientist, ICAR-Indian Institute of Rice Research (IIRR), Hyderabad participated in the training Workshop on Breeding Program Modernization during 02-13 December, 2019 (excluding journey period) held in Philippines.

Dr B Sailaja, Senior Scientist, ICAR-Indian Institute of Rice Research (IIRR), Hyderabad participated in Training on Advance ORYZA, and Training on Rice Yield Estimation system with MAPscape-Rice & ORYZA during 02-06 December 2019 (excluding journey period) in Hanoi, Vietnam.

Dr A K Singh, Principal Scientist, ICAR-Indian Agricultural Research Institute (IARI), New Delhi participated in the Plant Animal Genome XXVIII Conference & EIB Meeting during 11-15 January, 2020 (excluding journey period) held in San Diego, USA.

Dr C Bhardwaj, Principal Scientist, Genetics & Plant Breeding Division, ICAR-Indian Agricultural Research Institute (IARI), New Delhi participated in the Plant Animal Genome XXVIII Conference & EIB Meeting during 11-15 January, 2020 (excluding journey period) held in San Diego, USA.

Dr T Naepolean, Senior Scientist, ICAR-Indian Institute of Millets Research (IIMR) Hyderabad participated in the Plant Animal Genome XXVIII Conference & EIB Meeting during 11-15 January, 2020 (excluding journey period) held in San Diego, USA.

Dr Navin Chander Gahtyari, Scientist (Genetics & Plant Breeding), ICAR Vivekananda Parvatiya Krishi Anusandhan Sansthan, Almora, Uttarakhand participated in the training programme on "Pathology and Breeding Training Targeted For Wheat Blast" from 03/02/2020 to 28/11/2020 (excluding journey period) held in CIMMYT HQ, Mexico.

Dr Poonam Jasrotia, Senior Scientist, ICAR-Indian Institute of Wheat and Barley Research (IIWBR), Karnal participated in the 24th International Plant Resistance to Insects Symposium (IPRI2020) during 2-6 March, 2020 (excluding journey time) held in Mexico.

Dr S K Chaudhari, DDG (NRM), ICAR Hqrs. New Delhi participated in the Workshop on "Can Water Productivity Improvements Save us from Global Water Scarcity?" during 25-27 February, 2020 (excluding journey period) held in Italy.

Dr Gopalareddy K, Scientist, IIWBR, Karnal attended 10 days training programme on 'Wheat Blast Screening and Surveillance' held during 1-10 March, 2020 (excluding journey period), in Bangladesh.

Dr Vikas Gupta, Scientist, IIWBR, Karnal attended 10 days training programme on 'Wheat Blast Screening and Surveillance' held during 1st-10 March, 2020 (excluding journey period), in Bangladesh.

Collaborative Research Projects

- Collaborative research project proposal entitled "Exploitation of Inter-specific Diversity for Durum Wheat Improvement" in collaboration with University of Nottingham, International Center for Agricultural Research in the Dry Areas (ICARDA) and International Wheat and Maize Research Centre (CIMMYT) and ICAR-Indian Institute of Wheat & Barley Research (IIWBR), Karnal for the year 2015-2018 and extended for the year 2019.
- Collaborative research project entitled "Deployment of High-Yielding stress tolerant and top industrial quality durum wheat

elites to targeted growing regions of India" in collaboration with Indian Agricultural Research Institute (IARI), New Delhi and International Centre for Agricultural Research in the Dry Areas (ICARDA) for the period of four years.

- Collaborative research 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" in collaboration with ICAR-National Research Centre for Banana (NRCB), Trichy and Bioversity International (BI), Rome, Italy for the period 06 months (w.e.f. December, 2019 to May, 2020).

IC-I Section, DARE

Major activities undertaken

Approval was granted for signing of Memorandum of Understanding between Indian Council of Agricultural Research, New Delhi and The World Vegetable Centre (AVRDC), Taiwan. The MoU was signed by Dr Trilochan Mohapatra, Secretary, DARE & Director General, ICAR and Dr Marco Wopereis, Director General, The World Vegetable Centre.

About 34 cases of foreign deputation including short term and long term deputations were approved during 2019-2020.

About 33 cases for grant of approval/NOC to various organizations for organizing International Conferences/Workshops, etc. in India were approved during 2019-2020.

Approval for 3 cases of international consultancy projects at various ICAR Institutes was granted during 2019-20.

A number of cases related to grant of permission to foreign nationals for undergoing research work under various Post-Doctoral and Doctoral Fellowships were processed and approved.

Grant-in-Aid to the tune of ₹ 1.36 crore was released to National Academy of Agricultural Sciences, New Delhi.

Admission process of students from Africa under IAFS-III of MEA was processed and a total of about 16 African Students joined in various SAU/ICAR Institutes under various courses during 2019-20.

A total amount of ₹ 4,92,61,597 received from MEA was released to various SAUs/ICAR Institutes as fellowship under IAFS-III during 2019-20.

12 Short Term Training Programmes were conducted for African nationals at various ICAR Institutes under IAFS-III and a total of about 179 candidates were nominated for the training during 2019-20.

Admission process of students from Afghanistan under India Afghanistan Fellowship Programme of MEA was processed and a total of 74 students (approx) from Afghanistan joined in various SAU/ICAR Institutes under various courses during 2019-20.

A total amount of ₹ 3,66,99,020 received from MEA was released to various SAUs/ICAR Institutes as fellowship under India Afghanistan Fellowship Programme during 2019-20.

National Academy of Agricultural Sciences (NAAS)

The National Academy of Agricultural Sciences (NAAS), established in 1990, owes its origin to the vision of the late Dr B P Pal, FRS. The academy focuses on the broad field of agricultural sciences including crop husbandry, animal husbandry, fisheries, agro-forestry and interface between agriculture and agro-industry. The academy's role is to provide a forum to agricultural scientists to deliberate on important issues of agricultural research, education and extension and present views of the scientific community as policy inputs to planners, decision/opinion makers at various levels. To achieve this, the academy organizes and supports national and international congresses, conferences, seminars, symposia, workshops and brainstorming sessions on critical issues in the field of agricultural sciences. The academy accords recognition to scientists at various levels, and encourages cutting edge research in different fields of agricultural sciences.

The Fellows of the Academy, recognized for their contributions to science, include distinguished personalities in the field of agriculture and allied sciences, both from India and abroad. The academy has also established "Corporate Membership", "Corporate Fellowship" and "Institutional Membership" to attract involvement of Industry and Institutions in supporting the activities of the academy.

Objectives

The major objectives of the Academy, inter-alia, are to:

- promote ecologically sustainable agriculture,
- recognize and promote excellence of individual scientists in the field of agriculture,
- promote interaction among research workers in different institutions and organizations within the country and with the world scientific community,
- organize inter-disciplinary analysis of issues of importance to farmers and farming, and prepare further policies designed to advance agricultural research, education and development,
- carry out such activities as are relevant to the accomplishment of the above goals.

Management bodies

- The General Body of the Academy is constituted by its Fellows.
- The Executive Council is the main policy and decision making body.
- Statutory Committees have been constituted to deal with various aspects of governance of the Academy.

Indian Agricultural Universities Association, (IAUA)

Indian Agricultural Universities Association, (IAUA) was established on 10th November, 1967 (Registration no. 3489). There were only 9 founder member agricultural universities and their VC's were: founder president Dr P N Thaper, VC, PAU, Chandigarh (now Ludhiana); and members Shri V Pulla Reddy, VC, APAU (now ANGRAU), Hyderabad; Dr J S Patel, VC, JNKVV, Jabalpur; Shri D P Singh, VC, UPAU (now GBPUAT), Pantnagar; Dr K C Nair, VC, UAS, Bangaluru; Dr S N Das Gupta, VC, KU, Kalyani (now BCKV, Mohanpur); Dr K. Ramaiya, VC, OUAT, Bhubaneswar; Dr G S Mahajani, VC, UU (now MPUAT), Udaipur; and Dr M S Swaminathan, Director, IARI, New Delhi.

Objective

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, co-ordination and mutual consultation among agricultural universities. The Association also acts as a liaison between member universities and government departments to facilitate communication and expedite the needed action in matters of importance.

All the SAUs and institutions (deemed-to-be universities and Central Agricultural Universities) in India, which provide an integrated programme of teaching, research and extension education in agricultural sciences are qualified to become regular members of the Association.

Management bodies

Vice-Chancellors of member universities constitute the Association's General Body. The General Body meets once a year to decide the agenda for the next convention and other events and also for adoption of its audited accounts of the year and approval of budget estimates for the next financial year, besides the election of the office-bearers for the following calendar year. The Executive Committee of the Association consists of President, Vice-President, Secretary-General, Treasurer and three members. The Executive Committee meets quarterly.

The office of the Association is manned by Executive Secretary, who implements the decisions of General Body and Executive Committee on behalf of the Association. A quarterly newsletter is also being published by the Association since 2000, giving important news, events and achievements by member universities for the information of all the members and others interested. An Annual report is also published documenting all the activities of the year.

The information on events and proceedings are published through the host universities and the recommendations are also included in website (www.iauaindia.org) and circulated to all the VCs of member universities and other main stakeholders. Other than grant from ICAR/DARE, the main source of revenue of the Association is the annual subscription from member universities.

IC-II Section

Major activities undertaken

Processing of 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 / PhD/ 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, Work Bank, Commonwealth Secretariat, UN, etc.

v. NOC was granted to 10 ICAR scientists to apply in different training/ fellowship in international organizations.

vi. Permission was granted to 02 ICAR scientists for applying for position in different international organizations.

vii. Permission was granted to 03 scientist for extension of fellowship/ training in international organizations.

viii. A list of ICAR scientists (total 23 scientists) who were granted permission by this department for various fellowships/ training/foreign visits at foreign organizations/ institutes:

- Dr Ganesh Vasudeo Chaudhari, Scientist, VPKAS, Almora to attend 38th International Vegetable Training Course (Vegetable Breeding for the Tropics) organized by World Vegetable Center, East and Southeast Asia, Bangkok, Thailand during 18/11/2019 to 29/11/2019.
- Dr J K Saha, Head of Division/Regional Station, ICAR-Indian Institute of Soil Sciences for training "Exchange Training and Learning on Innovations and Options for Soil Protection and Rehabilitation" in Benin from 04/11/2020 to 09/11/2020.
- Mr Mohammed Koya K, Scientist, ICAR-Central Marine Fisheries Research Institute, Kochi to attend Leadership Training Course on Fisheries Resources Management (LTCFRM) 2019 organised by Overseas Fishery Cooperation Foundation of Japan, Tokyo during 06/11/2019 to 09/12/2019.
- Dr Anil Rai, ADG(ICT), ICAR Headquarters, New Delhi to attend the Chief Information Officer e-Governance Leadership Programme at Victoria University Wellington, New Zealand from 11/11/2019 to 15/11/2019.
- Dr Vartika Srivastava, Scientist, ICAR-NBPGR, New Delhi to attend Cryopreservation of Tropical Crop Species organized by Laboratory of Tropical Crop Improvement, Katholieke Universiteit (KU), Belgium from 25/11/2019 to 23/12/2019.
- Dr R A K Aggarwal, Principal Scientist, ICAR-NBAGR, Karnal to attend training on "Using Genebank Material for Livestock Populations, case studies and Optimisation using MoBPS Software organized by Agro Paris Tech & Image Consortium" at Paris Tech., France from 20/11/2019 to 22/11/2019.
- Dr Kanchan Kumar Singh, Assistant Director General (FE), ICAR to attend 15th Session of the governing council of the centre for sustainable agricultural mechanization on Asia and Pacific from 27/11/2019 to 29/11/2019 Organised by UNESCAP- Centre for Sustainable Agricultural Mechanisation (CSAM), Jeonju, Republic of Korea.
- Dr Shaik N Meena, Principal Scientist, ICAR-IIRI to participate in the stakeholders workshop on "Digital Extension" organised by International Fund for Agricultural Development (IFAD) at United Nation Body for 4 days from 06/12/2019 to 09/12/2019 in Egypt.
- Dr Pawan Kumar, Scientist, ICAR- IVRI, Izatnagar for attending "Long Term CMR-DHR International fellowship of Indian Council Of Medical Research for young Bio-Medical Scientist" at Wake Forest School of Medicine, Winston-salem, North Carolina from 01/02/2020 to 31/01/2021.
- Dr Soumen Naskar, Senior Scientist, ICAR-IIAB, Ranchi for INSA fellowship under Bilateral Exchange Programme organized by National Animal Science Research Institute, Nepal Agricultural Research Council, Khumaltar, Lalitpur, Nepal from 17/12/2019 to 03/01/2020.
- Dr S K Mangrauthia, Senior Scientist, ICAR-IIRR, Hyderabad for 2019 Borlaug International Agricultural Science & Technology Fellowship Programme

Borloug Fellowship at The Louisiana State University in Baton Rouge, USA from 13/12/2019 to 08/03/2020.

- Ms. Usha Rani Pedireddi, Scientist, ICAR-IARI, New Delhi for pursuing Ph D under ICAR International Fellowship at Texas A&M University, USA for period of 3 years from 16/12/2019 to 16/12/2022.
- Dr Ajay Kumar, Scientist, ICAR-IVRI, Izatnagar for availing Long Term ICMR-DHR (Indian Council of Medical Research Department of Health Research, New Delhi International Fellowship for young-Bio-medical Scientists 2019-20 at Auburn University, USA from 15/01/2020 to 14/01/2021.
- Dr K Lakshmi, Senior Scientist, ICAR-SBI, Coimbatore for attending Indo-US visiting fellowship organized by University of Florida, Department of Microbiology & Cell Science, Florida, USA from 26/1/2020 to 26/08/2020.
- Dr Veeresh Kumar, Scientist, ICAR-NBAIR, Bengaluru for attending Full Bright Nehru Fellowship at North Carolina State University, Raleigh, USA for a period of 24 months from 01/03/2020 to 28/02/2022.
- Dr Balvinder Kumar, Principal Scientist, ICAR-NRCE, Hisar for attending International Veterinary Vaccinology Network Laboratory Exchange Award, Roslin Institute, University of Edinburgh at Animal Health Trust, New Market, UK from 01/03/2020 to 30/04/2020.
- Mr Pushpendra Koli, Scientist, ICAR-Indian Grassland and Fodder Research Institute (IGFRI), Jhansi for attending ICAR International Fellowship at Murdoch University, Australia for a period of three years from 16/03/2020 to 15/03/2023
- Dr Bappa Das, Scientist, ICAR-Central Coastal Agricultural Research Institute, Goa for attending Agriculture Research Organization Israel Postdoctoral Fellowship 2020-21 at Institute of Soils, Water and Environmental Sciences, Israel from 01/04/2020 to 31/03/2021.
- Dr Shaik N Meera, Principal Scientist, ICAR-IIRR, Hyderabad for attending Technical Session on "Realizing the Potential of Digital Extension Strategies" in the International Forum on Innovation in Agriculture and Food Systems for achieving SDGs at Riyadh, Saudi Arabia from 15/03/2020 to 17/03/2020.
- Dr Shashank P R, Scientist, ICAR-IARI, New Delhi for attending visit and training on Sphingidae Museum management sample's DNA analyses and collection treatments organised by Ekologicke Centrum Orlov-Sphingidae Museum, Czech Republic from 15/03/2020 to 21/03/2020.
- Mr T Lakshmi Pathy, Scientist, ICAR-SBI, Coimbatore for pursuing PhD Under ICAR International Fellowship at Commonwealth Scientific and Industrial Research Organization (CSIRO) in collaboration with University of Queensland, Brisbane, Australia for 3 years from 01/04/2020 to 31/03/2023.
- Ms Divya Parisa, Scientist, ICAR-ATARI, Zone-VII, Umian for attending ICAR International Fellowship organized by University of Kiel, Germany for 3 years from 01/05/2020 to 30/04/2023.
- Mr Hemant Balasaheb Kardile, Scientist, ICAR-Central Potato Research Institute, Shimla for pursuing PhD under Graduate School Oregon State University Heckart Lodge 2900 SW Jefferson Way Corvallis, Oregon 97331 USA from 14/12/2020 to 13/12/2023.

Germplasm exchange

i. The cases of export of germplasm are processed in IC-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.

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

- NBPGR- for exchange of plant germplasm.
- NBAGR- for exchange of animal germplasm.
- NBFGR- for exchange of fish germplasm.
- NBAIR- for exchange of germplasm of agriculturally important insects.
- NBAIM- for exchange of germplasm of agriculturally important micro-organism.

- IARI- for exchange of germplasm of algae fungal.

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

iv. 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. Approvals of competent authority in respect of 02 cases were conveyed.

- Export of seeds of released varieties and advance lines of wheat (350x2) through CIMMYT, India to Bangladesh and Bolivia for screening against Wheat Blast in hot spot areas.
- Export of seeds dolichos/lablab bean, mung bean, moth bean, horsegram and cowpea to Senegal Tolerant Orpha Legumes for use in Dryland Farming System across Sub-Saharan Africa and India.

Annual Membership Contribution

i. Contribution for Annual Membership were released to International Seed Testing Association (ISTA), Switzerland and Centre for Sustainable Agricultural Mechanization (CSAM) (Regional Institution of UN ESCAP), Beijing, China.

- Annual Contribution to International Seed Testing Laboratory (ISTA), Switzerland on behalf of Seed Testing Laboratory, IARI, New Delhi amounting to ₹ 38,0613 was released on 18.01.2019 for the year 2019.
- Annual Contribution to Centre for Sustainable Agricultural Mechanization, CSAM (Regional Institution of UN ESCAP) Beijing, China amounting to US $ 15,000 released for the year 2019-2020 on 07.01.2020 and for the year 2020-2021 on 15.09.2020.

Brazil, Russia, India, China and South Africa (BRICS)

i. The Governments of the BRICS Member States comprising of Federative Republic of Brazil, Russian Federation, Republic of India, People's Republic of China and Republic of South Africa.

ii. The Memorandum of Understanding of BRICS Agricultural Research Platform was signed on 16th October, 2016. The ex-post facto cabinet approval has been obtained on 2nd August, 2017.

iii. The participants agreed to establish a virtual network to be known as the BRICS Agricultural Research Platform (hereinafter referred to as the BRICS-ARP) which will be a non-profit, international research platform under management and supervision of the participants for the purposes set forth in this Memorandum and will have full academic flexibility for the attainment of its objectives.

iv. ADG(IR) has been nominated as the Nodal Officer for implementing the MoU. Logistics for setting up the website, as well as BRICS Platform are under Consideration within BRICS member countries/MEA.

- Domain Name preference for BRICS Agricultural Research platform website agreed by Russia, South Africa and Brazil as www.bricsag.org.in. Information from China in this regard is still awaited.
- Focal points for BRICS ARP- Russia, Brazil and South Africa have provided the details as given below:
- Focal point for Russia: Mr Valery Sizov, Head of Desk, Department of International Cooperation, Ministry of Agriculture, Russian side.
- Focal point for Brazil: Ms. Adriana Mesquita Correa Bueno, Multilateral Relations Supervisor, Secretariat of Intelligence and Strategic Affairs of the Brazilian Agricultural Research Corporation (EMBRAPA).
- Focal point for South Africa: South Africa's Agricultural Research Council.
- Focal point for China: Information from China for focal point is still awaited.

v. The agriculture research platform is under process in consultation with MEA.

Memorandum of Understanding (MoU) between State Agriculture Universities in India and Foreign Institutes

i. Approval to seven (07) Memorandum of Understanding (MoU) were granted permission to sign between State Agriculture Universities in India and foreign Institutes.

- MoU between Guru Angad Dev Veterinary & Animal Sciences University, Ludhiana and University of Calgary, Canada on 11-09-2019.
- MoU between Rajasthan University of Veterinary and Animal Science, Bikaner with the International Livestock Research Institute (ILRI), Kenya on 01-01-2020.
- MoU between Chaudhry Charan Singh Haryana Agricultural University, Hissar, Haryana, and Tokyo University of Agriculture Japan on 04-03-2020.
- MoU between Acharya N.G Ranga Agricultural University, Guntur and Jigjiga University Ethopia, North East Africa on 17-03-2020.
- MoU between Punjab Agricultural University, Ludhiana and Jiangsu Academy of Agricultural Science, China Approved on 22-04-2020.
- MoU between Acharya N.G Ranga Agricultural University, Guntur with New Mexico State University, USA on 15-06-2020.
- MoU between Sri Venkateswara Veterinary University (SVVU), Tirupati and Royal Veterinary College/Royal College Street, London on 07-08-2020.

International Collaborations and Linkages

1. Agrinnovate India Limited facilitated the tech transfer and establishing an International linkage with Ms. Accrued Gains Pvt. Ltd., Republic of Botswana, by licensing 'Banana Pseudostem sap for use as biofertiliser for crop productivity enhancement. The technology developed by Navsari Agricultural University (NAU), Gujarat was transferred through a commercial non-exclusive license for a period of five years (December 2019).

Banana pseudostem sap, a by-product of extraction of banana fibre, is a rich source of plant nutrients and growth regulators. When enriched with organic inputs through anaerobic incubation, the sap acts as a rich source of nutrients replacing the use of chemical fertilizers and is also suitable for use in organic farming system.

2. Agrinnovate India Limited (AgIn) collaborated with BIRAC in licensing out the *Brucella* Vaccine technology *(Brucella abortus* S19Δper)for the control of bovine brucellosis developed by ICAR-IVRI, Bareilly, to Hester Biosciences Limited, Gujarat for a 'global market access for 15 years (September 2020).

Brucellosis, one of the most important zoonotic diseases worldwide, is endemic in India. *Brucella abortus* S19 strain, modified by deletion mutation helps overcome the drawbacks of earlier used live attenuated *B. abortus* S19 in terms of safety and interference with sero-diagnosis of clinical infection.

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 Agri innovation through startup support.

Banana Pseudostem sap tech transfer at Navsari Agricultural University, Gujarat

IC-III Section

Major activities undertaken

MoUs signed

i. MoU between Indian Council of Agricultural Research, New Delhi, India and Hawassa University, Ethiopia

A Memorandum of Understanding has been signed on 23rd December, 2019 between Indian Council of Agricultural Research (ICAR), New Delhi, India and Hawassa University, Hawassa, Ethiopia for Cooperation in Agricultural Research and Education.

Under this MoU, both the Organisations agreed to promote cooperation in the field of education and research through:

- Exchange of research students and scientists for educational and research programs of mutual interest.
- Exchange of academic materials and publications in the field of education and research.
- Collaborative research programs, seminars and workshops.
- Faculty development program of mutual interest.
- Joint consultancies.
- Other academic/research activities as deemed appropriate and mutually agreed by both parties.

ii. MoU between Indian Council of Agricultural Research (ICAR), New Delhi, India and Heinrich Heine University (HHU), Dusseldorf, Germany

A Memorandum of Understanding has been signed on 24th January, 2020 between Indian Council of Agricultural Research (ICAR), New Delhi, India and Heinrich Heine University (HHU), Dusseldorf, Germany for Introducing Genome Edited Traits for Bacterial Blight Resistance into Indian Rice varieties.

Under this MoU, both the Organisations agreed to promote cooperation in the following areas:

- 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.
- Development and implementation of collaborative research projects, the areas and methodology to be as mutually agreed upon and subject to IPR clause of the MoU.

Brucella Vaccine technology transfer consent between various stakeholders.

iii. MoU between Indian Council of Agricultural Research (ICAR), New Delhi, India and the Donald Danforth Plant Science Center (DDPSC), Saint Louis, USA

A Memorandum of Understanding has been signed on 13th May, 2020 between Indian Council of Agricultural Research (ICAR), New Delhi, India and Donald Danforth Plant Science Center (DDPSC), Saint Louis, USA for cooperation in Agricultural Research and Product Development.

Under this MoU, both the organisations will foster a collaborative research relationship by undertaking the following:

- To jointly develop and implement strategies and plans, including research, regulatory, and product development activities, to achieve delivery of crop varieties improved through modern biotechnology for Indian agriculture;
- To jointly propose and engage in the development and implementation of collaborative research projects, the areas and methodology to be as mutually agreed upon and subject to Intellectual Property Rights clause of the MoU;
- To organize activities of mutual interest, including expert consultations, conferences, workshops, and training programs in fulfilment of common objectives; and
- To explore and promote opportunities for bilateral scientific exchanges, including temporary staff or research fellowships.

iv. MoU between Indian Council of Agricultural Research (ICAR), New Delhi, India and Asia-Pacific Association of Agricultural Research Institutions (APAARI), Bangkok, Thailand

A Memorandum of Understanding has been signed on 23rd October, 2020 between Indian Council of Agricultural Research (ICAR), New Delhi, India and Asia-Pacific Association of Agricultural Research Institution (APAARI), Bangkok, Thailand for cooperation in Agricultural Research and Education.

Under this MoU, both the Parties agreed to promote cooperation in the following fields to:

- Promote exchange of experts in agriculture between the Council and APAARI member countries;
- Designate Council's institutes as 'Centers of Excellence' in different areas such as agri-biotechnology, conservation of genetic resources, agricultural innovations, etc as per mutual agreement and jointly organize capacity development training modules/programmes for APAARI member countries, subject APAARI's approval of its strategy for establishing a Centre of Excellence by its Executive Committee;
- Jointly scope for regional projects on agricultural matters related to research, policy, innovation, development and capacity development and develop and implement new collaborative programmes as mutually agreed upon, and subject to IPR clause of this MoU;
- Document Success Stories of innovations/ technologies developed by the Council to be published by APAARI for the benefits of countries in Asia Pacific;
- Co-organize capacity development and policy development/advocacy events as required in agriculture innovation and technologies of common interest as per mutual agreement;
- Enhance the visibility of both the organizations through an innovative knowledge dissemination mechanism.
- Participate in apex committees of the other party on reciprocal basis.

Workplans signed

i. A Work Plan for the period 2020-2021 has been signed on 04.12.2019 between Indian Council of Agricultural Research (ICAR), New Delhi, India an autonomous body under the aegis of DARE and The International Fertilizer Development Center (IFDC), Alabama, USA. This work plan has been signed under the provision of Memorandum of Understanding (MoU) for Cooperation in Agricultural Research & Education signed on 16th May, 1994 between the Indian Council of Agricultural Research (ICAR), New Delhi, India and International Fertilizer Development Centre (IFDC), Alabama,U.S.A.

ii. A Work Plan for the period 2020-2021 has been signed on 13.02.2020 between Indian Council of Agricultural Research (ICAR), New Delhi, India an autonomous body under the aegis of DARE and The Agricultural Research Council, Pretoria, South Africa. This work plan has been signed under the Memorandum of Understanding (MoU) for Cooperation in Agricultural Research and Education signed on 26 July, 2018 between the Indian Council of Agricultural Research (ICAR), New Delhi, India and The Agricultural Research Council, Pretoria, South Africa.

iii. A Work Plan for the period 2017- 2019 signed on 3rd October, 2017 between Indian Council of Agricultural Research (ICAR), New Delhi, India an autonomous body under the aegis of DARE and The Sri Lanka Council of Agricultural Research Policy (SLCARP), Sri Lanka has been extended upto December, 2020. This work plan has been signed under the Memorandum of understanding between Indian Council of Agricultural Research (ICAR), New Delhi and Sri Lanka Council of Agricultural Research Policy (SLCARP), Sri Lanka of Scientific and Technical Cooperation concluded on 2nd July, 1998.

Joint Working Group (JWG) Meetings:

The 1st India-Vietnam Joint Working Group on Agriculture between Ministry of Agriculture and Rural Development of Vietnam and Ministry of Agriculture and Farmers Welfare of India, held at Ha Noi, Vietnam from 18th – 21st November, 2019 in coordination with DARE and MEA. The following officers from Indian side participated in the said JWG:

i. Dr J K Jena, Deputy Director General (Fisheries Science), ICAR

ii. Dr J P Mishra, Assistant Director General (PI&M), ICAR

iii. Sh Manash Chodhury, Joint Adviser (Agriculture), NITI Aayog

iv. Dr S S Tomar, Additional Commissioner (Crops), Department of Agriculture Cooperation & Farmers Welfare

v. Sh R K Gupta, Deputy Commissioner, Department of Animal Husbandry & Dairying, Ministry of Fisheries, Animal Husbandry & Dairying

Representative of Embassy of India in Vietnam, Ha Noi

vi. Sh Rajesh Uike, Deputy Chief of Mission, Embassy of India, Vietnam, Hanoi

vii. Sh Aman Bansal, Second Secretary, Embassy of India, Vietnam, Hanoi

viii. Mr Pham Quyet Thang, Embassy of India, Vietnam, Hanoi.

The Indian representatives on the said JWG had detailed discussion and interaction with Indian Ambassador at Embassy of India at Hanoi; Representatives of Ministry of Agriculture & Rural Development (MARD), Government of Vietnam; Scientists and Experts at Vietnam Academy of Agriculture Sciences, Hanoi; Field Crop Research Institute (FCRI); International Centre for Genetic Engineering & Bio-technology, Vietnam Institute of Agriculture Engineering and Post Harvest Technology, Research Institute for Aquaculture-1 (RIA-1); Department of Science and International Cooperation, Government of Vietnam. The important issues of discussions and likely collaboration are summarized as under:

Organizational structure of Vietnam India JWG on Agriculture

I. Cooperation in Science and Technology, viz.
   - Cooperation in Crop Science and Technology
   - Cooperation in Aquaculture & Livestock
   - Cooperation in Forestry and ICT in Agriculture
   - Cooperation in exchange of germplasm and information.

II. Management of Plant Phytosanitary and Animal Veterinary, viz.
   - Cooperation on Phyto-sanitary issues
   - Plant Disease Management
   - Animal Disease Management

III. Trade and Investment

IV. Building Capacity and Training

Comprehensive Review of MoUs:

A Comprehensive Review of Memorandum of Understanding (MoU) signed between DARE/ ICAR and foreign Government/Organizations/ Institutions has been undertaken in DARE. This department has sought the consent/ comments of Foreign Government/Organizations/Institutions for continuation/ dis-continuation on those MoUs which have remained dormant or no activity has taken place since considerable period of time. The responses from some foreign organizations have been received and are under consideration of this Department in consultation with ICAR. A final decision on discontinuation/ termination of these MoUs shall be taken after due consultation with MEA.

Foreign Deputations:

- Dr Kuldeep Kumar Lal, Director, National Bureau of Fish Genetic Resources (NBFGR), Lucknow visited Bangkok, Thailand from 5-7th November, 2019 to attend the regional consultative workshop on strengthening governance of Aquaculture for sustainable development in Asia and related country review studies and Demographic change in Fishing communities in Asia organized by NACA and FAO-RAP.
- A delegation led by Dr Joy Krushna Jena, DDG (Fy. Sci), ICAR and Dr J.P. Mishra, ADG (PIM) being one of the members from ICAR visited Hanoi, Vietnam for attending India-Vietnam Joint Working Group on Agriculture meeting held from 18th November to 21st November, 2019.

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.

IISS Bhopal confirmed that Government to Government and Institution to Institution MoUs have been signed by the concerned parties for establishment of Soil, Water & Tissue Testing laboratory (SWTTL) in Tunisia. The draft project document (DPR) and the draft tender document have also been submitted to MEA. The modifications suggested by Ministry of External Affairs in the draft agreement are under consideration of this Department.

India's annual Contribution to APAARI and NACA

- **India's Annual Contribution to Asia-Pacific Association of Agricultural Research Institutions (APAARI), Bangkok, Thailand:-**

  APAARI is a Food and Agricultural Organization (FAO) led initiative and is an apolitical, neutral, non-profit forum of National Agricultural Research Systems (NARS) and Agricultural Research institutions in the Asia- Pacific Region, in the pursuit of common objectives. The mission of APAARI is to promote and development of National Agricultural Research Systems (NARS) in the Asia- Pacific Region through facilitation of intra-regional, inter-institutional and international cooperation/ partnership. The overall objective of the association is to foster agricultural research for development in the Asia- Pacific Region so as to help address the concerns of hunger, poverty, environmental degradation and sustainability of agricultural production.

  Indian Council of Agricultural research (ICAR) is a founder member of APAARI since its establishment in 1990 at Bangkok, Thailand under the auspices of FAO. DARE/ICAR is being benefitted tremendously by joining APAARI as a regular member through increased participation in the workshops, conferences, expert consultations, policy dialogues and meetings organized by APAARI.

  Secretary (DARE) & Director General, ICAR who is also the Vice-Chair of the Executive Committee of APAARI has participated in Online Executive Committee Meeting (ECM) of Asia-Pacific Association of Agricultural Research Institutions (APAARI) held from July 8-10, 2020 through digital video conferencing.

  India's Annual Contribution of US $ 10,000 has been paid to Asia-Pacific Association of Agricultural Research Institutions (APAARI), Bangkok, Thailand for the years 2019-20 in February, 2020.

- **India's Annual Contribution to Network of Aquaculture Centres in Asia-Pacific (NACA), Bangkok, Thailand:**

  The Network of Aquaculture Centres in Asia-Pacific (NACA) is an Inter-Governmental organisation formed in 1988 is based at Bangkok, Thailand, which has been greatly involved in aquaculture development in the Asia-Pacific region. The current member Governments of NACA are: Australia, Bangladesh, Cambodia, China, Hong Kong SAR (China), India, Indonesia, Iran, Lao PDR, Malaysia, Maldives, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam.

  The objectives of NACA are to promote development of aquaculture through increase in fish production as a food security, poverty alleviation by improving rural income, employment & socio-economic conditions of

fish farmers, diversify farm production and the environment and resource management.

The Core activities of NACA are: Capacity building through education and training, collaborative research and development through networking among centres; development of information and communication networks; policy guidelines and support to policies and institutional capacities; aquatic animal health and disease management and genetics and biodiversity.

NACA has been playing a leadership role in the overall aquaculture development in the region through the active participation of its member countries. The programmes operated by NACA have been able to connect the countries, and the lessons learned by one country is easily transferred to others through the network. Besides aquaculture development, its role in aquatic animal health & disease management, and genetics & biodiversity studies has been found substantial.

During the last seven years, the support received by India, especially in developing programmes on fish disease surveillance its execution through the expertise of NACA has been acclaimed and acknowledged. During 2019, the collaborative effort of NACA and ICAR in organising a major event on Fish Genetics in ICAR-NBFGR, Lucknow with the participation of several international experts has been quite fruitful and this would guide us in formulating future programmes.

NACA has been providing all possible support through the participation of its experts in different programmes organised in the country and the platform of NACA has been providing scope to highlight the intellectual capacity of India and work programmes of ICAR institutes before the member countries, thereby building a huge image of ICAR/DARE and the country. Besides, the support received on the human resource development of our researchers from time to time in different subject areas is also quite substantial. The recognition of ICAR-Central Institute of Freshwater Aquaculture (CIFA), Bhubaneswar as one of the four NACA Lead Centres and the scope of presenting the work of the institute before the Network members itself has also elevated the image of the country.

India's Annual Contribution has been paid to Network of Aquaculture Centres in Asia-Pacific (NACA), Bangkok, Thailand for the years 2019-20 in the month of March, 2020. Annual contribution payable to NACA is US $ 60,000 per annum.

IC-IV Section

Major activities undertaken

Major Foreign Visits during the year 2019-20

- The cases of Foreign visits of Scientists of ICAR are processed in online Foreign Visit Management System (FVMS) of ICAR and a total no. of 76 cases were processed by this section during 1st November, 2019 to 10th October, 2020.

Indo-ASEAN Research Collaboration

- The 7th ASEAN India Working Group meeting on Agriculture and Forestry was held on 14th October, 2019 in Brunei Darussalam. Dr A K Nayak, Principal Scientist and Shri A R Sengupta, Deputy Secretary, DARE attended the meeting.
- The 5th ASEAN India Ministerial Meeting on Agriculture and forestry (AIMMAF) was held during 16th–17th October, 2019 at Brunei Darussalam Shri Kailash Choudhary, the Hon'ble Minister of State (Agriculture & Farmers Welfare) attended the meeting. The Ministerial Meeting reaffirmed the commitment to contribute towards the vision and priorities of the ASEAN-India Partnership for Peace, Progress and Shared Prosperity (2016-2020), post-2015 Sustainable Development Goals and related goals of the UN Zero Hunger Challenge.
- 6th ASEAN-India Ministerial Meeting on Agriculture and Forestry (AIMMAF) was held virtually during 20-21 October, 2020, at Cambodia. Shri Kailash Choudhary, Hon'ble Minister of State for Ministry of Agriculture Cooperations and Farmers' Welfare participated in the said meeting and Dr. A. Arunachalam, ADG (IR) was nominated as Focal point and SOM leader for the aforesaid meeting.

Indo-BIMSTEC Collaboration

- International Seminar on Climate Smart Farming Systems for BIMSTEC member states was held during 11-13 December, 2019 in New Delhi wherein thirteen delegates from BIMSTEC countries and BIMSTEC Secretariat attended the Seminar.

  During the seminar the delegates visited ICAR-Indian Agricultural Research Institute (IARI), the premiere Agricultural Research Institute of ICAR and interacted with Dr A. K. Singh, Director, ICAR-IARI and scientist colleagues. During the interaction, the BIMSTEC delegates were delighted to witness the role of IARI and also the agri-tech progress in India and expressed their interest to take it to their country. The delegates visited the IARI museum and Nanaji Deshmkuh Phenomics facility followed by field visit to Integrated Farming System Model.

  On 13 December, 2019, the delegates visited the ICAR-Indian Institute of Farming Systems Research (IIFSR), Modipuram, the premiere Research Institute working on Integrated Farming Systems and visited the farmers' field and different IFS models developed and interacted with different stakeholders. They were exposed to parallel production system of Integrated Organic Farming system and towards Organic Agriculture promoted by the institute at village Sardhana of Meerut district. Later on they visited the ICAR-IIFSR institute campus where in IFS model for marginal (0.72 ha) and small (1.5 ha) have been shown. They were explained about the design of cropping systems for family nutrition with biofortified wheat varieties, soil health and income generation besides horti-pasture (Kinnow+fodder) and horticulture-based farming systems. The delegates were also given first hand/practical information on preparation of liquid/solid manures for organic farming besides interaction with participants of Certified Farm Advisor on Organic Farming. BIMSTEC delegates have also visited ICAR-Central Potato Research Institute campus (CPRI), Modipuram and ICAR-Central Institute for Research on Cattle (CIRC), Meerut and interacted with the scientists about climate resilient technologies and food systems.

- Overall, the International Seminar on Climate Smart Farming Systems brought new insights and enriched the very process the cooperation amongst BIMSTEC countries.

Indo Afghanistan Research Collaboration

Indian Agricultural Research Institute (IARI) is playing important role in developing trained human resource for agricultural research in Afghanistan and in establishing Afghan National Agricultural Sciences and Technology University (ANASTU) at Kandahar in Afghanistan, with the support of the Ministry of External Affairs (MEA), Government of India under the bilateral cooperation programme between Afghanistan and India. IARI conducted various activities during the year.

Indo-SAARC Collaboration

India has been collaborating in promoting Agricultural Sectoral Research and Developmental activities in the SAARC Region. Participation of DARE/ICAR was confirmed in the various SAARC programmes. A number of training proposals have been received from SAARC Secretariat/SAARC Agriculture Centre (SAC) and the same have been conducted successfully by obtaining necessary clearances and coordinating between SAARC Sectt., ICAR Institutes and other organizations. Institutional Charges have been waived off for the SAARC Programmes held at ICAR Institutes.

On the basis of the vacancies announcement by the SAARC Secretariat, Dr A.K. Samanta, Pr. Scientist, ICAR- NIANP, Bengaluru has been deputed at the position of Senior Programme Specialist (Livestock) at SAARC Agriculture Centre, Dhaka, Bangladesh for the period of three years. Further, Dr Grinson George, Pr. Scientist, ICAR- CMFRI, Kochi has also been posted for the post of Senior Programme Specialist (Fisheries) recently.

Recently, Dr A Arunachalam, ADG (IR) has been nominated as SAARC Governing Board Member for the SAARC Agriculture Centre (SAC) from India by this department.

Sh. Prem Prakash Maurya, US (IC-IV) has been nominated as focal point/ member of the Technical Committee on Agriculture and Rural Development (TCARD).

Advance Centre for Agricultural Research & Education (ACARE)

- A Memorandum of Agreement for setting up of an "Advance Centre for Agricultural Research & Education" (ACARE) at Yezin, Myanmar to assist Government of Myanmar's efforts in capacity building of Myanmar's scientific and technical staff with support of equipment, training, research and participatory knowledge management, was signed between the Ministry of External Affairs (MEA), Govt. of India and Department of Agricultural Research & Education (DARE), Govt. of India on 21st September, 2015.
- The total financial outlay of the project funded by the Ministry of External Affairs, Government of India is US $ 83,15,822 which was equivalent to ₹ 50,84,29,357 (calculated @ 1 US$ = 61.14 during the time of approval in the financial year 2014 – 2015).
- Extension of ACARE Project has been approved till March 31st, 2022 without any additional financial grant.

International Collaborative Projects

- During 1st November, 2019 to 10th October, 2020, a total of Seven International Collaborative projects have been sanctioned by this department and are being implemented in various ICAR Institutes in Collaboration with Foreign Partners.

The following collaborative projects have been sanctioned by this department:

- Collaborative project entitled "Evaluation of Sunflower pre-bred lines for stress resistance and associated trade-offs with yield".
- Foreign collaborative project entitled: "Impact of emerging nanomaterials and environmental contaminants on human and livestock reproductive health and identification of biomarkers".
- Foreign collaborative project entitled "The mechanism behind formation of cookable milk gels (GELCOOK)".
- Foreign collaborative project entitled "Transfer of mitigation technologies for heat stress in farm animals".
- Foreign collaborative project entitled "Assessing the productiveness and adaptiveness of two different goat breeds to heat stress based on differences in the phenotype and genotype traits".
- Collaborative research project entitled: "Dialogues in Gender and Coastal Aquaculture Gender and the seaweed farming value chain".
- Collaborative research project entitled "Global Challenges Research Fund (GCRF) south Asian Nitrogen Hub".

04

PROGRESSIVE USE OF HINDI

During financial year 2020-21 up to 30.09.2020 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 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:

i. **Policy Implementation:** The Official Language Division of the Department, manned by an officer of the level of Assistant Director (OL) and one supportive staff 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.

ii. **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 140 offices and attached stations with regional offices of ICAR have been notified till date.

iii. **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) & Secretay, ICAR, who is the nodal officer for implementation of the Official Language Policy in DARE. Two meetings have been organized upto 30.09.2020 and follow up action has been taken in compliance with the decisions taken in these meetings.

iv. **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.

v. **Inspections w.r.t. Official Language Policy:** During the year, upto 30.09.2020, two 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. Parliamentary Committee on Official Language has also conducted inspection of Rani Laxmi Bai Central Agricultural University, Jhansi, an autonomous body under DARE, on 20.08.2020 to review the progressive use of Hindi in the University.

vi. **Translation Work:** Translation of documents falling under section 3(3) of Official Language Act,1963 has been done by Official Language wing of this Depatment. 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 on their priority.

vii. **Hindi Fortnight (Pakhwada):** Hindi pakhawada was observed form 14th September, 2020 to 29th September, 2020 in the Department in association with ICAR. On the occasion of "Hindi Diwas", messages of Hon'ble Agriculture Minister and Addtional Secretary (DARE) & Secretary (ICAR) regarding progressive use of Hindi were circulated. In addition, various Hindi competitions were also organized during Hindi Fortnight .

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 relate to food and agriculture including animal husbandry, dairying and fisheries. Development of Human Resources in Agricultural Research/Extensions and Education.
4. Cess 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.

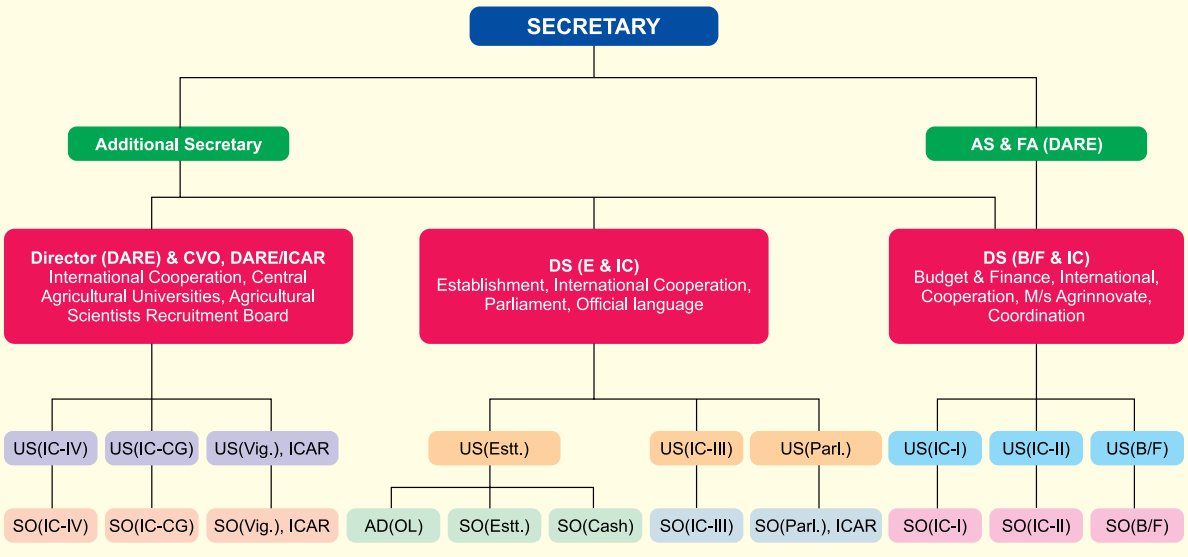
Part III

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 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

DEPARTMENT OF AGRICULTURAL RESEARCH AND EDUCATION



Total Strength

(as on 02.11.2020)

Group	Designation	Sanctioned Strength	Filled up	Vacant
A	Secretary	1	1	0
A	Additional Secretary	1	1	0
A	Additional Secretary & Financial Advisor	1	0	1
A	Director	1	1	0
A	Deputy Secretary	2	2	0
A	Senior PPS/ Principal Staff Officer	1	1	0
A	Joint Director	1	0	1
A	Under Secretary	7	6	1
A	Principal Private Secretary	3	0	3
A	Assistant Director (Official Language)	1	1	0
B	Private Secretary	3	2	1
B	Section Officer	8	3	5
B	Assistant Section Officer	5	4	1
B	Personal Assistant	4	0	4
B	Senior Translation Officer	1	1	0
C	UDC-cum-Cashier	1	0	1
C	Senior Secretariat Assistant (UDC)	1	0	1
C	Stenographer Grade D	3	5	-2
C	UDC-Hindi Typist	1	0	1
C	Staff Car Driver	1	0	1
C	Junior Secretariat Assistant (LDC)	1	0	1
C	Daftry	1	0	1
C	MTS	5	1	4
	Total	**54**	**29**	**25**

NAMES OF THE IMPORTANT FUNCTIONARIES

S. No.	Name	Designation
1.	Dr. Trilochan Mohapatra	Secretary (DARE) and DG (ICAR)
2.	Vacant	Additional Secretary and Financial Advisor
3.	Shri Sanjay Kumar Singh	Additional Secy. (DARE) and Secretary (ICAR)
4.	Shri Shaleen Agrawal	Director
5.	Shri Mohinder Kumar	Principal Staff Officer
6.	Shri P. Ramamoorthy	Deputy Secretary
7.	Shri Uday Shanker Pandey	Deputy Secretary
8.	Vacant	Under Secretary
9.	Shri Rajesh Kumar	Under Secretary
10.	Shri Jitendra Misra	Under Secretary
11.	Shri Prem Prakash Maurya	Under Secretary
12.	Shri A. G. Subramanian	Under Secretary
13.	Shri Shailendra Kumar Upadhyay	Under Secretary
14.	Shri Surajit Saha	Under Secretary

Budget Allocation

Details of Budget allocation of DARE (Proper)
(₹ In lakh)

Sl No.	Budget Head	Accounting Head	BE-2019-20	RE-2019-20	BE-2020-21
I	**DARE-Secretariat**				
	Salaries	345100090090001	590.00	500.00	540.00
	OTA	345100090090003	0.25	0.00	0.00
	Medical Treatment	345100090090006	14.75	8.00	15.00
	DTE	345100090090011	50.00	40.00	60.00
	FTE	345100090090012	50.00	20.00	40.00
	Office Expenses	345100090090013	50.00	70.00	60.00
	OAE	345100090090020	40.00	40.00	40.00
		Total: Secretariat	**795.00**	**673.00**	**755.00**
II	**Membership Contributions**				
	CABI	241580798010032	25.35	25.35	25.35
	CCGIAR	241582798020032	590.00	545.00	545.00
	APAARI	241582798040032	9.00	9.00	9.00
	NACA	241580798050032	46.00	46.00	46.00
	CGPRT	241580798060032	0.00	0.00	0.00
	ISTA	241580798070032	4.25	4.25	4.25
	ISHS	241580798080032	0.40	0.40	0.40
		Total: Contribution	**675.00**	**630.00**	**630.00**
III	**DARE-Payment of Net Proceed of Cess Under AP Cess Act, 1940**	**241501150050031**	**10.00**	**10.00**	**10.00**
IV	**Central Agricultural Universities:**				
00.259 General (Agricultural Research & Education Schemes) (Minor Head)					
01 GIA to Central Agricultural University, Imphal					
01.00.31Grants-in-Aid General			2393	2240	2400
01.00.35 Grants for creation of Capital Assets			6700	6700	9000
01.00.36 Grants-in-Aid Salaries			9500	9522	8990
Total-GIA General to Central Agricultural University, Imphal			**18593**	**18462**	**20390**
2415- Agricultural Research & Education (Major Head)					
80.120 Assistance to other Institutions (Minor Head)					
02 GIA to RLB Central Agricultural University, Bundelkhand (Jhansi)					
02.00.31 Grants-in-Aid General			405	405	500
02.00.35 Grant for creation of Capital Assets			6992	7671	10000

02.00.36 Grant-in-Aid Salaries	500	425	500
Total-GIA to CAU, Bundelkhand, Jhansi	**7897**	**8501**	**11000**
03 GIA to RP Central Agricultural University, (Pusa) Bihar			
03.00.31. Grants-in Aid General	1010	955	1100
03.00.35 Grants for creation of Capital Assets	10000	10000	6000
03.00.36 Grant-in-Aid Salaries	8000	8000	7490
Total- GIA to Central Agricultural University, Bihar	19010	18955	14590
Total Budget : All three Central Agricultural Universities	**45500**	**45918**	**45980**
V. National Academy of Agriculutral Sciences (NAAS) & Indian Agricultural University Association (IAUA):			
05.00.31 Grant-in-Aid general	156	156	160
Total-GIA to NAAS & IAUA	**156**	**156**	**160**
06.00.31 Grant-in-Aid general	1570	892	900
06.00.35 Grant for creation of Capital Assets	1490	021	500
06.00.36 Grants-in-Aid Salaries	900	571	658
Total: GIA to ASRB	**3960**	**1484**	**2058**

Summary

RE 2019-20 (In lakh)

DARE (Sectt.)	:	₹ 678.00
Contributions	:	₹ 630.00
AP Cess	:	₹ 10.00
CAUs	:	₹ 45918
NAAS	:	₹ 156
ASRB	:	₹ 1484
Total	**:**	**₹ 48876**

BE 2020-21 (In lakh)

DARE (Sectt)	:	₹ 755.00
Contributions	:	₹ 630.00
AP Cess	:	₹ 0.00
CAUs	:	₹ 45980
NAAS	:	₹ 160
ASRB	:	₹ 2058
Total	**:**	**₹ 49583**

सत्यमेव जयते

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