NAHEP CAAST: Bringing excellence through fostering linkages between Frontier Sciences and Industry

NAHEP-AN ICAR WB PROJECT

KNOWLEDGE BROCHURE

NAHEP

Centres for Advanced Agricultural Sciences and Technology

P.K. Ghosh | Prabhat Kumar

NATIONAL AGRICULTURAL HIGHER EDUCATION PROJECT
INDIAN COUNCIL OF AGRICULTURAL RESEARCH
Krishi Anusandhan Bhawan II, Pusa Campus, New Delhi (India)
https://nahep.icar.gov.in

NAHEP CAAST: Bringing excellence through fostering linkages between Frontier Sciences and Industry

NAHEP: AN ICAR-WB PROJECT

KNOWLEDGE BROCHURE

NAHEP

Centres for Advanced Agricultural Sciences and Technology

P.K. Ghosh | Prabhat Kumar

NATIONAL AGRICULTURAL HIGHER EDUCATION PROJECT
INDIAN COUNCIL OF AGRICULTURAL RESEARCH
Krishi Anusandhan Bhawan II, Pusa Campus, New Delhi (India)
https://nahep.icar.gov.in

Citation	:	P.K. Ghosh and Prabhat Kumar, 2019. NAHEP CAAST: Bringing excellance through fostering linkages between frontier sciences and inudstry. National Agricultural Higher Education Project, ICAR, New Delhi-110012 PP-128
Printed	:	August, 2019
Editors	:	P.K. Ghosh Prabhat Kumar
Design	:	Mr. Arvind Jha, Consultant (M&E), NAHEP
Copyright	:	Indian Council of Agricultural Research, New Delhi
Disclaimer	:	The information collated and edited in this volume is mainly based on the input provided by Principal Investigators (PIs) of the sub-projects funded by NAHEP
Published by	:	National Director National Agricultural Higher Education Project Indian Council of Agricultural Research (ICAR) Krishi Anusandhan Bhawan-II, Pusa, New Delhi -110 012
Phone	:	+ 91-11-2584 8772
Email	:	nd.nahep@icar.gov.in
Website	:	https://nahep.icar.gov.in

Designed & Printed at:
M/s Royal Offset Printers, A-89/1, Naraina Industrial Area, Phase-I, New Delhi-110 028 Mobile: 9811622258

TABLE OF CONTENTS

CAAST Component of NAHEP would enable AUs to establish multidisciplinary centers for teaching, research and extension on critical and emerging agricultural topics.

-Project Appraisal Document - NAHEP, World Bank

त्रिलोचन महापात्र, पीएच.डी.
सचिव एवं महानिदेशक

TRILOCHAN MOHAPATRA, Ph.D.
SECRETARY & DIRECTOR GENERAL

भारत सरकार
कृषि अनुसंधान और शिक्षा विभाग एवं
भारतीय कृषि अनुसंधान परिषद
कृषि एवं किसान कल्याण मंत्रालय, कृषि भवन, नई दिल्ली 110 001

GOVERNMENT OF INDIA
DEPARTMENT OF AGRICULTURAL RESEARCH & EDUCATION
AND
INDIAN COUNCIL OF AGRICULTURAL RESEARCH
MINISTRY OF AGRICULTURE AND FARMERS WELFARE
KRISHI BHAVAN, NEW DELHI 110 001
Tel.: 23382629; 23386711 Fax: 91-11-23384773
E-mail: dg.icar@nic.in

MESSAGE

The National Agricultural Higher Education Project (NAHEP) is an innovative project supporting agricultural universities for relevant and quality education. The project has completed one and a half years duration and took many initiatives including student activities like training, exposure visit, delivering lectures and conducting workshops / brain storming, etc. as per the World Bank guidelines.

I am happy to note that ICAR NAHEP unit is bringing out a **knowledge brochure** on *"NAHEP CAAST: Bringing excellence through fostering linkage between frontier sciences and industry"* which is very timely. I compliment National Coordinators and National Director for their efforts in bringing out this publication.

(T. MOHAPATRA)

Dated the 1st August, 2019
New Delhi

राष्ट्रीय कृषि उच्च शिक्षा परियोजना (राकृउशिप)
National Agricultural Higher Education Project (NAHEP)
कृषि अनुसंधान भवन–II, भारतीय कृषि अनुसंधान परिषद, पूसा, नई दिल्ली–110 012, भारत
K.A.B.–II, Indian Council of Agricultural Research, Pusa, New Delhi-110 012, India

डा. राकेश चन्द्र अग्रवाल
Dr. Rakesh Chandra Agrawal
राष्ट्रीय निदेशक, (राकृउशिप) / National Director (NAHEP)

FOREWORD

The Indian Council of Agricultural Research (ICAR) in collaboration with World Bank has conceived a National Agricultural Higher Education Project (NAHEP) to enable the agricultural education system, catch up nationally and internationally with the Peers. The project has three well defined components, Centre of Advanced Agricultural Science and Technology (CAAST) is one of the three sub-components of Component–1. The CAAST sub-component is primarily to support agricultural universities to establish multi-disciplinary centre for teaching, research and extension on critical and emerging topic of importance and also integrating agricultural education with employment and entrepreneurship. The CAAST sub-component facilitates Masters and Ph.D. students sandwiched programme, Modern research facilities, Development of short courses for skill development, Capacity building programme for student, faculty and research scholars, Faculty upgradation through national and international training, Collaboration with national and international centres of excellence, Distinguished lecture series, collaboration with industries, etc. At present the CAAST sub-projects are being implemented in 14 agricultural universities, of which 5 sub-projects have been awarded to agricultural universities very recently. ICAR NAHEP has taken a lead to document various activities carried out under 9 on-going sub-projects during the last one and a half years under CAAST in the form of **Knowledge Brochure** on *"NAHEP CAAST: Bringing excellence through fostering linkage between frontier sciences and industry"*. The initiative for bringing this document by Dr. P.K. Ghosh, NC, CAAST and Dr. Prabhat Kumar, NC, M&E is highly appreciated. The information in Knowledge Brochure is very informative, precise and will serve as an example for other components in the development of such document.

(R.C. Agrawal)

Phone : +91-11-25848772 (O), Fax : +91-11-25843403, Email : nd-nahep@icar.gov.in, Website: https://nahep.icar.gov.in

ACKNOWLEDGMENT

With higher education emerging as an international service, there is a growing concern world over about quality, standard and relevance. A number of strategic funding programmes have been implemented to promote higher education, however, the implementation of National Agricultural Higher Education Project is unique to deal with standard of education for under-graduate and post-graduate students, faculty upgradation, strengthening universities to get accreditation and leadership development in agricultural universities. The Centre of Advanced Agricultural Science and Technology (CAAST), an important sub-component of the project, is being implemented in 14 ready reforms agricultural universities.

The author profusely thanked Dr. N.S. Rathore, the then National Director and DDG (Education) and Dr. R.C. Agrawal, National Director for their constant encouragement and support for bringing out the publication. Special thanks are due to Secretary (DARE) and DG (ICAR), Additional Secretary (DARE) and Secretary (ICAR), FA (DARE), Director (Finance) and other members of finance team for their encouragement and constant support. We are thankful to all the PIs of 9 agricultural universities for timely providing required information from their university.

Finally, thanks are due to PIU unit, TTL and World Bank officials, Mr. Arvind Jha and CAAST team (Yash, Dalit, Dayashankar) for their help in compiling and designing the material.

Editors

INTRODUCTION

About NAHEP

NAHEP is designed to strengthen the national agricultural education system in India with overall objective to provide more relevant and high quality education to agricultural university students. This programme has been promoting efficiency and competiveness through changes in working mechanism of agricultural universities, raising the teaching and research standards through improved research and teaching infrastructure and enhanced faculty competency and commitments, and making agricultural education more attractive to talented students. There are four key components under NAHEP, namely; **Institutional Development Plan (IDP), Centres for Advanced Agricultural Sciences and Technology (CAAST), ICAR to support excellence in agricultural universities (AUs), and ICAR Innovation Grants to AUs.** It is envisaged that improved AU performance through quality enhancement, better employment and entrepreneurship opportunities created for agriculture graduates, non-accredited AUs attaining ICAR accreditation, and institutional reforms implemented in education division of ICAR and AUs under these components together shall contribute to the achievement of the overall program objective.

About Centres for Advanced Agricultural Science and Technology

Under this component, select accredited AUs have been awarded projects for the establishment of Centres for Advance Agricultural Science and Technology (CAAST). These Centres would be multidisciplinary and interdisciplinary in nature for teaching, research and extension on critical and emerging issues of agriculture. Like other components of NAHEP, the selection process of CAAST projects has been made on the basis of competition and performance. The key provisions for funding under CAAST include research and teaching equipment, faculty and scientist development fellowships, postgraduate student scholarships, and the costs associated with twinning arrangements with similar centers both nationally and internationally.

The investments under CAAST component contribute more towards enhancing the relevance of the teaching and research. The focus of CAAST hinges upon development of multidisciplinary faculty, innovative approaches to teaching and research, technology development and commercialization. The holistic approach to teaching and research for agriculture and rural development would be building capacities in a specialized thematic area and cutting-edge agricultural science and make AUs globally

competitive and locally relevant. High emphasis on industry orientation of agricultural science and technology generation system through strengthened association and partnership will be laid under this component. It is envisaged that the support and efforts under CAAST would strengthen agricultural higher education with better employment and entrepreneurship opportunities for agriculture graduates.

The activities and research achievements of the AUs under CAAST are spread over a number of thematic areas such as Conservation Agriculture, Precision farming / Farm Mechanization, Secondary Agriculture, Specialty agriculture, Renewable Energy Sources, Integrated Farming System (IFS), Agriculture Market Intelligence, Good Agricultural Practices, Hitech/Protected Cultivation, Climate Resilient Agriculture, Food Safety, Big Data Analysis and Genomics-assisted Breeding.

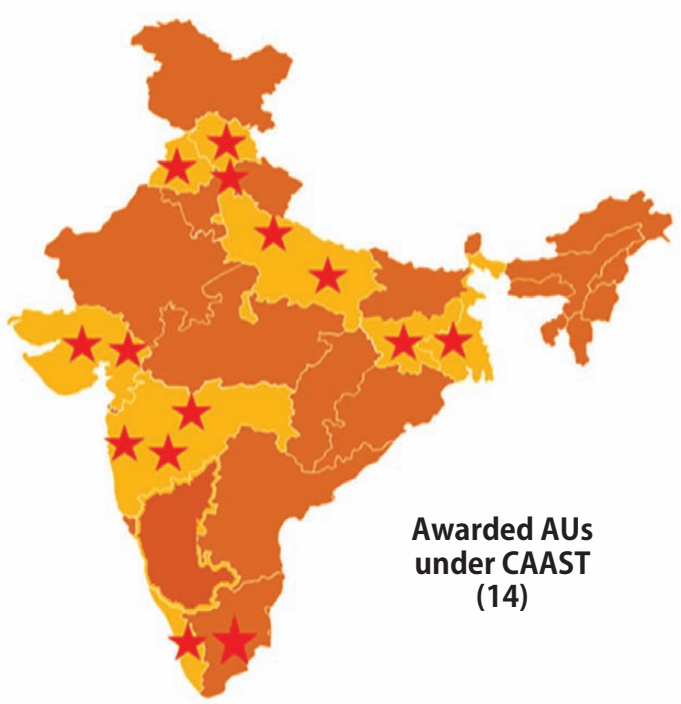
Scope of activities for CAAST component

The Centres of Advance Agricultural Sciences & Technology (CAAST) is to support interdisciplinary advanced centers for innovative approaches to teaching, research, extension and capacity building in the specialized area for holistic development. The emphasis is on participation of industries in these centres for skill development for enhanced employability and entrepreneurship. There is provision to undertake following activities under CAAST component:

- New PG course development and existing PG course revision, with emphasis on applied problem solving and entrepreneurship.
- Development of certificate courses for skill development in areas such as high-tech horticulture, food processing and precision farm technology.
- Master and Ph.D. students sandwich program to facilitate student exposure to national and international universities.
- Modern research facilities to conduct high-quality advanced research by faculty and students.
- Faculty upgradation through international and national training with mentor universities.
- Targeted research collaboration with national and international centres of excellence to increase both faculty/student productivity and research quality and relevance.
- Adjunct/Visiting Professorship opportunities to stimulate innovation in ongoing PG research and to mentor PG students.
- Distinguished Lecture Series/ Special lectures to bring about much needed vibrancy in the academic atmosphere and inspire students and faculty to perform better.
- Collaboration with private sector, industry and civil society organizations related to the specialized areas to develop market-oriented programs and produce industry-ready graduates.
- Conducting capacity building programmes for students, faculty and research scholars across the country

GEOGRAPHICAL DISTRIBUTION OF CAAST PROJECTS

Exhibit: Geographical distribution of awarded AUs under CAAST till date



The CAAST sub-component is being implemented in nine participating universities, details of university along with thematic area is finished below:

S. No.	Name of University	Thematic area
1.	Bidhan Chandra Krishi Vishwavidyalaya, West Bengal	Conservation Agriculture
2.	Central Institute of Fisheries Education, Mumbai	Development of Energy Efficient and Environment Protective Aquaculture Technologies for Degraded Soils
3.	Chandra Shekhar Azad University of Agriculture and Technology, Kanpur	Nutritional Crops
4.	Mahatma Phule Krishi Vidyapeeth, Rahuri	Climate Smart Agriculture and Water Management

S. No.	Name of University	Thematic area
5.	Indian Veterinary Research Institute, Izatnagar	Advanced Centre for Livestock Health
6.	Navsari Agricultural University, Navsari	Establishment of Secondary Agriculture Unit for skill development in students and farmers
7.	Indian Agricultural Research Institute, New Delhi	Genomics Assisted Crop Improvement and Management
8.	University of Agricultural Sciences, Bangalore	Centre for Next Generation Technologies in Adaptive Agriculture
9.	Punjab Agricultural University, Ludhiana	School of Natural Resources Management for Sustainable Agriculture

Recently, another five CAAST sub-projects have been awarded to AAU, Anand, BAU, Ranchi, CSKHPKV, Palampur, KAU, Kerala& VNMKVV, Parbhani.

The current brochure depicts the insights, knowledge and innovations generated by 9 awarded AUs (Call – I) under CAAST component through multitudes of initiatives encompassing Trainings (for both students and faculties), workshops, Brainstorming sessions, Lecture series etc., conducted during last one and half year (2018-19).

KEY EVENTS CONDUCTED UNDER CAAST SUB-PROJECTS

A. NATIONAL AND INTERNATIONAL EVENTS (TRAININGS / EXPOSURE VISITS / FACULTY UPGRADATION PROGRAM / CONSULTANCY PROGRAM)

Central Institute of Fisheries Education, Mumbai: National and International Events (Trainings)

S. No.	Participation in National and International Events	No. of participants	Duration	Activity
1.	International Conference on "Challenges and Opportunities for Sustainable Fisheries and Aquaculture Development (COSFAD)", College of Fisheries, Ratnagiri, Maharashtra	10 students & 10 faculty	17-20 January, 2019	
2.	Brackish water Aquaculture Conference (BRAQCON)- 2019, International Conference, ICAR-CIBA, Chennai	2 students & 5 faculty	22-25 January, 2019	
3.	International Fisheries & Aquaculture Expo (AQUAEX 2019), Hyderabad	3 students	31 January - 2 February, 2019	

S. No.	Participation in National and International Events	No. of participants	Duration	Activity
4.	XIV Agricultural Science Congress, NAAS, Complex, New Delhi	1 student	20-23 February, 2019	
5.	12th Asian Fisheries and Aquaculture Forum, Iloilo, Philippines	7 students	8-12 April, 2019	
6.	Asian Pacific Aquaculture (APA'2019) Conference, Chennai	50 students & 12 faculty	19-21 June, 2019	 
7	Students' Convention on "Next Generation Aquaculture: Panacea to Employment Challenges", ICAR-CIFE Mumbai	350	25-26 March, 2019	

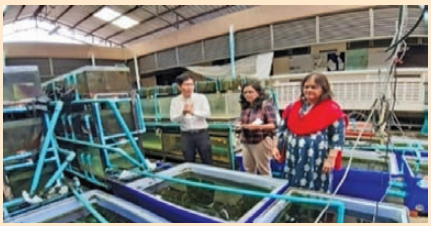
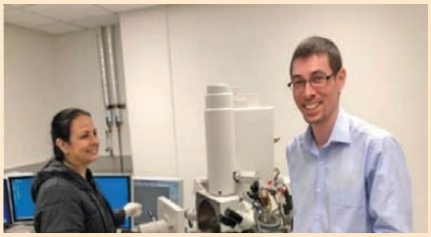
Consultancy program

Two Consultancy Programmes were organized in association with industry consultants for students at ICAR-CIFE, Mumbai on Packaging, labelling, branding and marketing strategies for value-added fish products and entrepreneurship opportunities in ornamental fish trading.

S. No.	Title	No. of students	Duration	Activity
1.	Consultancy training programme on "Packaging, labelling, branding and marketing strategies for value added fish products".	11 students	18-24 March, 2019	
2.	Consultancy training programme on "Entrepreneurship opportunities in ornamental fish trading".	12 students	18-24 March, 2019	

Faculty upgradation program

S. No.	Faculty name	Country/ University	Duration	Activity
1.	Dr. Paramita Banerjee, Senior Scientist	Asian Institute of Technology, Pathumthani, Thailand	18-22 March, 2019	

S. No.	Faculty name	Country/ University	Duration	Activity
2.	Dr. Babitha Rani, Senior Scientist	Asian Institute of Technology, Pathumthani, Thailand	18-22 March, 2019	
3.	Dr. Shamna N, Scientist	University of Las Palmas, Canary Islands, Spain	30 March -15 May, 2019	
4.	Dr. Gayatri Tripathi, Principal Scientist	Centre for Environmental Contaminants Research, CSIRO, Glen Osmond, Adelaide, Australia	1-15 April, 2019	

UAS, Bangalore: National and International events

S. No.	Exposure visit/training and participation of students/ faculty in National and International Events	No. of participants	Duration	Activity
1.	Post-graduate students were trained under a five day training program on "Emerging Innovative Trends in Food Processing". Students at UAS, Bangalore were trained on extrusion cooking, nano-encapsulation and value addition in millets.	35	21-25 January, 2019	

S. No.	Exposure visit/training and participation of students/ faculty in National and International Events	No. of participants	Duration	Activity
2.	Post-graduate students were trained and exposed to rainwater harvesting and its effective utilisation in crop production (Aquaponics) at Madhavi Farms, Bannerghatta Road, Bangalore.	56	2-4 April, 2019	 
3.	Post-graduate students from the Department of Agricultural Engineering, Horticulture and Food Science were trained at CSIR-CFTRI, Mysore for 5 days on "Post-harvest technologies of fresh fruits and vegetables for commercial trade".	19	10-14 June, 2019	 

S. No.	Exposure visit/training and participation of students/ faculty in National and International Events	No. of participants	Duration	Activity
4.	A training program was conducted for 24 Post-Graduate students on "Climate Change: Concern for Food Security and Processing in India". Students were exposed to processing of grapes at KADU Winery, Channapatna, recent advances in food packaging for defense use at DRDO-DFRL and Coffee Processing at Harley Coffee Estate Ltd., Sakaleshpur, Hassan.	24	25-29 June, 2019	 
5.	Hands on training on Nanopore sequencing was conducted on 16th April 2019, at Department of plant pathology, UAS, GKVK, Bengaluru.	14	16 April, 2019	
6.	Hands on training on Next Generation Plant Disease Diagnostics was conducted for 10 days with the objectives to train young students and research scholars on diagnosis of major diseases of crops caused by fungi, bacteria and viruses using advanced tools.	25	20-29 June, 2019	 

S. No.	Exposure visit/training and participation of students/ faculty in National and International Events	No. of participants	Duration	Activity
7.	Post-graduate students and young faculty from three departments of University of Agricultural Sciences Bengaluru and students from State Agricultural Universities of south India were trained under three different capacity building programs on phenotypic and DNA marker data analysis and applications of plant genome editing for crop improvement.	124 Student and faculty	6-8 March, 2019	  Participants of training programme
8.	Training programme on endophytes plant interactions was organised with faculty and scientist from different institute participated.	26 34	17-22 December, 2018 27-28 March, 2019	 

S. No.	Exposure visit/training and participation of students/ faculty in National and International Events	No. of participants	Duration	Activity
Exposure Visit				
9.	Internship for post-graduate students at Monsanto India Ltd.	30	September, 2018	
10.	Field visit of PG students of the Department of Genetics and Plant Breeding to East-West Seed Com.	50	21 November, 2018	
11.	Hands on Training on Molecular Biology and Scientific Writing, organised at VC Farm Manyda	30	17-26 July, 2019	

Faculty Upgradation Programme

S. No.	Faculty name	Country/ University	Duration	Activity	Photo
1.	Dr. Nataraja Karaba N,	Department of Plant Physiology, Friedrich-Schiller-University Jena, Matthias-Schleiden-Institute Durenberger Str. 159 07743 Jena, Germany	15 days 10 - 24 May 2019	Training on plant-endophyte interactions, scientific discussions and interaction meetings on endophyte enrichment technology	
2.	Dr. S. Ramesh	CIMMYT, Mexico	12 days 15 – 26 July, 2019	International Training on "Statistical analysis of genetic and phenotypic data for breeders"	
3.	Dr. Anil Kumar C., Research Associate	CIMMYT, Mexico	12 days 15 – 26 July, 2019	International Training on "Statistical analysis of genetic and phenotypic data for breeders"	

CSAU&T, Kanpur: National and international events

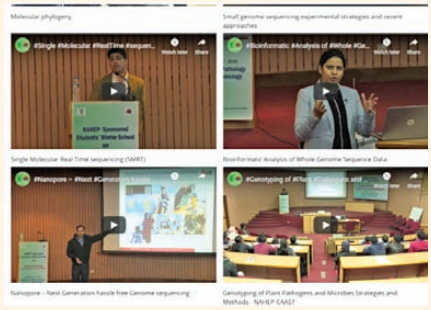
S. No.	Participation in National and International Events	No. of participants	Duration	Activity
Exposure Visit				
1.	Visit to Indian Agricultural Research Institute (IARI), New Delhi	Students & Faculty Participated-34	28-29 January, 2019	
2.	Visit to Central Institute for Subtropical Horticulture (CISH), Lucknow.	Students & Faculty Participated-185	16 February, 2019	
3	Visit to Indian Institute of Sugarcane Research (IISR), Lucknow	Students & Faculty Participated-57	16 February, 2019	
4.	Visit to Central Institute for Subtropical Horticulture (CISH), Lucknow	Students & Faculty Participated-55	19 February, 2019	

S. No.	Participation in National and International Events	No. of participants	Duration	Activity
5.	Visit to Indian Institute of Sugarcane Research (IISR), Lucknow	Students & Faculty Participated-55	19 February, 2019	
6.	Visit to Central Seed Testing Laboratory, Varanasi	Students & Faculty Participated-27	18 March, 2019	
7.	Visit to Indian Institute of Vegetable Research (IIVR), Varanasi	Students & Faculty Participated-27	19 March, 2019	
National Training				
8.	National training on Advances in seed production and seed quality management of nutritional crops	Lecture delivered-8, Students & Faculty Participated-98	18-19 February, 2019	

S. No.	Participation in National and International Events	No. of participants	Duration	Activity
9.	National training on Recent Advances in Protected Cultivation of Vegetables	Lecture delivered-10, Students & Faculty Participated-95	20-21 February, 2019	
10.	National training on Recent Trends In Value Addition of Vegetables	Lecture delivered-06, Students & Faculty Participated-54	5-6 March, 2019	
11.	National training on Innovations in Seed Production & Seed Quality	Lecture delivered-8, Students & Faculty Participated-164	9-10 March, 2019	
12.	National Training on recent Advances in Post-harvest processing of pulses &Vegetables	Lecture delivered-5, Students & Faculty Participated-68	13-14 March, 2019	

S. No.	Participation in National and International Events	No. of participants	Duration	Activity
13.	National Training on Advance Technology of food processing	Lecture delivered-6, Students & Faculty Participated-57	16-17 March, 2019	
14.	Students Mentoring Program-8	Lectures delivered-30, Faculty & students participated 185, Department involved-7	28-30 March, 2019	

IARI, New Delhi: National and International events

S. No.	Participation in National and International Events	No. of participants	Duration	Activity
National training				
1.	For enhancing knowledge and skills of PG students, a training programme on *"Genomics of Plant Pathogens and Agriculturally Important Microbes"* was conducted for 26 M.Sc. and Ph.D. students.	26	19-31 December, 2018	 
2.	Eighteen lectures and 15 practicals were also webcasted for the benefit of students and faculty for enhancing their knowledge and skills in the area of genomics.	-	e-Resources facilitating 24x7 online access to all researchers	http://www.nahep-caast.iari.res.in/  

S. No.	Participation in National and International Events	No. of participants	Duration	Activity
3.	A practical manual was brought out and Dr. T. Mohapatra, Secretary, DARE and DG, ICAR released the Brochure & training manual	26	31 December, 2018	
4.	Certificates are distributed to participatory students by DG, ICAR	26	31 December, 2018	
International training				
5.	Dr. Mahesh Rao undergone two months training on "Advanced Cytogenetic Tools" at Plant Breeding Department, IFS Research Centre for Bio systems, Justus Liebig Univ., Giessen, Germany	1	2 months (15 April – 14 June 2019)	 

S. No.	Participation in National and International Events	No. of participants	Duration	Activity
6.	Ms. Arfa Anjum, Ph.D. Student, Bioinformatics, IARI (4th from the left, 1st row) undergone three month training on "Statistical Genomics "at Washington State University, Pullman, USA	1	3 months (1 April – 30 June 2019)	
7.	Students participated 4th International Plant Physiology Congress (IPPC-2018) at Lucknow, India	5	2-5 December, 2018	
8.	Ms. Padmavati G. Gore, Ph.D. Student, Discipline of Plant Genetic Resources attended *"3rd Jack R. Harlan International Symposium" at Montpellier, France.* Around 163 researchers from 38 countries were participated in this event.	1	3-7 June, 2019	

NAU, Navsari: National and International events

S. No.	Exposure visit/training and participation of students/ faculty in National and International Events	No. of participants	Duration	Activity
Exposure visit				
1.	Visit to Center of Excellence for Bamboo Products, Waghai	24 P.G. Students + 3 SRFs + 2 Co-PIs	1 day (13 February, 2019)	
2.	Visit and hands on training in preparation of Bamboo Artisans at Ambapada-Waghai	24 P.G. Students + 3 SRFs + 2 Co-PI	1 day (13 February, 2019)	
3.	Visit to VANIL Udyog-Navtad, Waghai	24 P.G. Students + 3 SRFs + 2 Co-PI	1 day (13 February, 2019)	

S. No.	Exposure visit/training and participation of students/ faculty in National and International Events	No. of participants	Duration	Activity
4.	Visit to NABL accredited Pesticide Residue Laboratory at AAU, Anand	25 P.G. students	1 day (1 April, 2019)	
5.	Visit to Vidya Dairy, Anand	25 P.G. students	1 day (1 April, 2019)	
6.	Visit to Directorate of Medicinal & Aromatic Plants Research, Boriavi, Anand	25 P.G. students	1 day (2 April, 2019)	
7.	Dairy Technology for Non-dairy Technologist	11 (SRFs-3, Ph.D. Students-3, M.Sc. Students-5)	6 days (26 June to 1 July, 2019)	

S. No.	Exposure visit/training and participation of students/ faculty in National and International Events	No. of participants	Duration	Activity
8.	NABL accredidated Training at Pesticide Residue Laboratory, Anand Agricultural University, Anand (Gujarat)	5 (SRFs-2, Ph.D. Students-1, M.Sc. Students-2)	7 Days (2-8 July, 2019)	

Faculty Upgradation Programme

S. No.	Faculty name	Country/ University/ Institute /Place	Duration	Activity
1.	Dr. Susheel Singh, Co-PI (CAAST) and Asst. Prof., FQTL, NAU, Navsari & Dr. Vipulkumar Parekh, Co-PI (CAAST) and Asst. Prof., FQTL, NAU, Navsari	Pollucon Laboratory, Surat, Gujarat	1 Day (5 March, 2019)	
2.	Dr. Susheel Singh, Co-PI (CAAST) and Asst. Prof., FQTL, NAU, Navsari & Dr. Vipul Kumar Parekh, Co-PI (CAAST) and Asst. Prof., FQTL, NAU, Navsari	Thermo Fisher Scientific, Bharuch, Gujarat	1 Day (12 June, 2019)	

S. No.	Faculty name	Country/ University/ Institute /Place	Duration	Activity
3.	Dr. M. S. Sankanur, Co-PI (CAAST) and Asst. Prof., CoF, NAU, Navsari	Ambapada-Waghai	1 day 2 November, 2019	
4.	Dr. R. P. Gunaga, Co-PI (CAAST project) and Assoc. Prof., CoF, NAU, Navsari & Dr. S.K. Sinha, Co-PI (CAAST) and Asst. Prof., CoF, NAU, Navsari	IWST, Bengaluru, Karnataka	2 days (1-2 July, 2019)	
5.	Dr. R. P. Gunaga, Co-PI (CAAST project) and Assoc. Prof., CoF, NAU, Navsari & Dr. M. S. Sankanur, Co-PI (CAAST) and Asst. Prof., CoF, NAU, Navsari	Indian Institute of Natural Resins & Gums, Ranchi, Chhattisgarh	2 days (9-10 July, 2019)	 

BCKV, W.B: National and International events

S. No.	Participation in National and International Events	No. of participants	Duration	Activity
1.	Visit of associated scientists at ICAR-Indian Agricultural Research Institute, New Delhi	06	28 March, 2019	
2.	Visit of associated scientists at ICAR-Central Soil Salinity Research Institute, Karnal	06	29 March, 2019	 

S. No.	Participation in National and International Events	No. of participants	Duration	Activity
3.	Visit of associated scientists at Borlaug Institute for South Asia, Ludhiana	06	30 March, 2019	
4.	83rd Annual Convention and Seminar on "Development in soil science-2018" of the Indian Society of Soil Science held at Anand, Gujrat	04	27-30 November, 2018	
5.	National seminar on "Use of agrochemicals for a sustainable agriculture and environment" at Bidhan Chandra Krishi Viswavidyalaya, Kalyani	20	27 March, 2019	
6.	Work shop on Data analytics at Inter disciplinary Statistical Research Unit, Indian Statistical Institute, Kolkata	01	10-15 March, 2019	

S. No.	Participation in National and International Events	No. of participants	Duration	Activity
7.	IFCAM winter school 2018 on "Stochastic methods for uncertainty quantification and sensitivity analysis of complex models" at IISER, Kolkata.	01	3-14 December, 2018	

MPKV, Rahuri: National and International events

S. No.	Participation in National and International Events	No. of participants	Duration	Activity
National Training				
1.	Python Programming in CSA MPKV, Rahuri,	35 students 4 faculty	4-5 May, 2019	
2.	Application of Precision Farm Machinery MPKV, Rahuri,	19 students 10 faculty	22- 27 May, 2019	

S. No.	Participation in National and International Events	No. of participants	Duration	Activity
3.	ICT for Effective Knowledge and Extension Delivery for CSAWM MPKV, Rahuri	98 students 8 faculty	11-12 June, 2019	
4.	Hyperspectral Remote Sensing and Spectroradiometry in CSA MPKV, Rahuri,	108 students 12 faculty	14-15 June, 2019	
5.	Linux Programming, MPKV, Rahuri	35 students 7 faculty	1-3 July, 2019	
6.	Protected Cultivation Technology College of Agriculture, Pune,	28 students 5 faculty	15-19 July, 2019	

Exposure Visit

S. No.	Exposure visit and participation of students/faculty in National and International Events	No. of participants	Duration	Activity
1.	Scientific Visit to KVK, Baramati and National Institute for Abiotic Stress Management, (NIASM), Malegoan	14 faculty	12 March, 2019	
2.	Study - cum - Exposure visit at Gujarat and Rajasthan (Dept. of Agril. Botany) NAU, AAU, Gujarat and MPUAT, Rajasthan under CAAST-CSAWM, MPKV, Rahuri	34 students 4 faculty	25-28 March, 2019	
3.	Study - cum - Exposure visit at AAU, Gujarat, under CAAST-CSAWM, MPKV, Rahuri	37 students 5 faculty	28-30 March, 2019	
4.	A visit on Agro-climatic networking at Vaishnavdham (Bhuchakewadi) village, Tal. Junner, Dist. Pune CAAST-CSAWM, MPKV, Rahuri	17 faculty	6 May, 2019	

S. No.	Exposure visit and participation of students/faculty in National and International Events	No. of participants	Duration	Activity
5.	Field visit at Demonstration plot of Shenit Village, Block Akole, Dist-Ahemadnagar under CAAST-CSAWM, MPKV, Rahuri	12 faculty	20 May, 2019	

Exposure Visit

S. No.	Demonstration and participation of students/faculty in National and International Events	No. of participants	Duration	Activity
1.	Field Demonstration under Techno week on horticultural and wheat crops through drone-mounted sprayer, CAAST-CSAWM, Sub campus College of Agriculture Pune.	35 students 11 faculty	8 February, 2019	
2.	Demonstration on bio fertilizer seed treatment at Buchkewadi, Ta.Junnar, Dist. Pune under CAAST-CSAWM, MPKV, Rahuri	5 faculty 25 farmers	16 July, 2019	

S. No.	Demonstration and participation of students/faculty in National and International Events	No. of participants	Duration	Activity
3.	Demonstration on drone spraying technology in MPKV, Joint Agresco, Exhibition under CAAST-CSAWM, MPKV, Rahuri	55 faculty 27 students	29 May, 2019	

IVRI, Izatnagar : National and International Events

Faculty Upgradation Programme

S. No.	Faculty name	Country/ University	Duration	Activity
1.	Dr. Bina Mishra, Principal Scientist	Pirbright Institute, UK	One Month	Training in the area of new generation vaccine
2.	Dr. Dr Madhu Hosamani Principal Scientist	Wageningen biodiversity Research University, Lelystad, The Nether land	One Month	Training in the area of advanced diagnostics and vaccinology
3.	Dr Chandrashekhar Scientist	University of Maryland, USA	One Month	Training in the area of reverse genetics

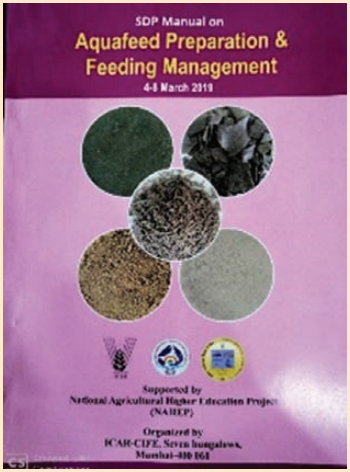
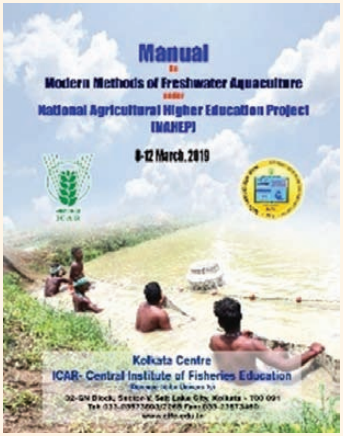
Short Visit Faculty

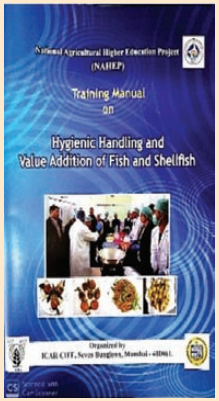
S. No.	Faculty name	Country/ University	Duration	Activity
1.	Dr. Aniket Sanyal Principal Scientist & Joint Director, IVRI, Bengaluru	Pirbright Institute, & University of Reading	One week	Exposure visit in the area of advanced Diagnostics and for developing liaison for future collaboration
2.	Dr. Pallab Chaudhury Head, Bacteriology and Mycology Division, IVRI, Izatnagar	Pirbright Institute, & University of Reading	One week	Exposure visit in the area of advanced areas of vaccinology and for developing liaison for future collaboration
3.	Dr. Samiran Bandopadhyay Principal Scientist, ERS-Kolkata	Pirbright Institute, & University of Reading	One week	Exposure visit in the area of antimicrobial and for developing liaison for future collaboration

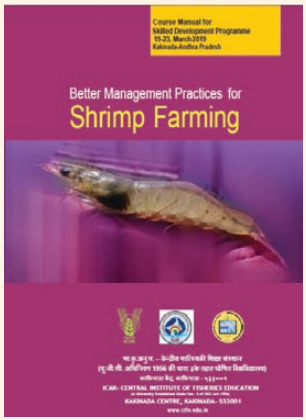
B. SENSITIZATION WORKSHOPS / INDUSTRY MEETS / SKILL DEVELOPMENT PROGRAMMES

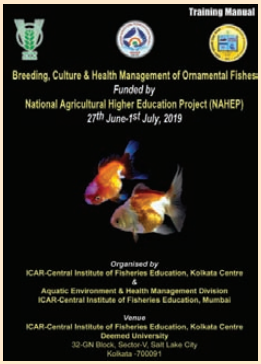
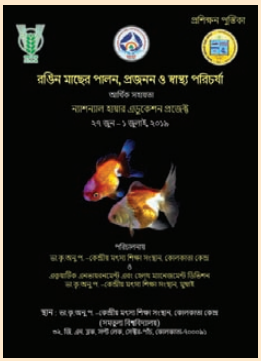
CIFE, Mumbai

S. No.	Events	No. of participants	Duration	Activity
1.	Farmer-cum-Industry Meet, ICAR-CIFE, Mumbai, Maharashtra	225	28 February, 2019	
2.	Farmer-cum-Industry Meet, ICAR-CIFE Kakinada Centre, Andhra Pradesh	16	15 March, 2019	
3.	National Fish Farmers' Day, ICAR-CIFE, Mumbai	210	10 July, 2019	

S. No.	Events	No. of participants	Duration	Activity
4.	"Aquafeed preparation and feeding management", ICAR-CIFE, Mumbai	22	4-8 March, 2019	
5.	"Modern Method of Freshwater Aquaculture", ICAR-CIFE Kolkata Centre, West Bengal	25	8-12 March, 2019	

S. No.	Events	No. of participants	Duration	Activity
6.	"Carp Culture Practices and Recent Advances", ICAR-CIFE Powarkheda Centre, Hoshangabad, Madhya Pradesh	25	11-15 March, 2019	
7.	''बिहार में मछली पालन के उन्नत तकनीक एवं प्रबंधन'' at ICAR-CIFE Regional Centre, Motipur, Bihar	100	11-15 March, 2019	
8.	"Hygienic handling and value addition of fish and shellfish" at ICAR-CIFE, Mumbai	24	11-15 March, 2019	

S. No.	Events	No. of participants	Duration	Activity
9.	"Inland Saline Aquaculture Management Practices", ICAR-CIFE, Rohtak Centre, Haryana	23	11-15 March, 2019	
10.	"Communicating Science" was organized, ICAR-CIFE, Mumbai	27	14-20 March, 2019	
11.	"Better Management Practices for Shrimp farming", ICAR-CIFE, Kakinada Centre, Andhra Pradesh	22	19-23 March, 2019	

S. No.	Events	No. of participants	Duration	Activity
12.	Women Skill Training Development Programme on "Breeding culture and health management of ornamental fishes", ICAR-CIFE, Kolkata Centre, West Bengal	28	26 June - 1 July, 2019	 
13.	Workshop on "Syllabus Revision and Academic Reformation in Higher Fisheries Education" at ICAR-CIFE, Mumbai	116	18-19 February, 2019	 

S. No.	Events	No. of participants	Duration	Activity
14.	Sensitization Workshop on "Inland Saline Aquaculture" at ICAR-CIFE, Rohtak Centre, Haryana	370	8 December, 2018	
15.	Workshop on "Genomic Selection in Aquaculture" at ICAR-CIFE, Mumbai	31	16-18 January, 2019	 
16.	Seminar on "Genomic Tools and Genetic Selection in Aquaculture" at ICAR-CIFE, Mumbai	89	17 January, 2019	

S. No.	Events	No. of participants	Duration	Activity
17.	POSH Workshop on "Discrimination and Harassment at Workplace" at ICAR-CIFE, Mumbai	154	17 November, 2018	
18.	Seminar on "Efficient Value Chain in Fisheries and Aquaculture"	101	15 June, 2019	
19.	Write shop for making illustrations and sketches for inclusion in the BMP manual on shrimp farming	15	18-22 June, 2019	

UAS, Bangalore

S. No.	Events	No. of Participants	Duration	Activity
1.	Three workshops on endophytes plant interaction and forecasting of pest and diseases with total of 204 students, faculty and scientist from private industry participated and gained knowledge on these topics.	204	17-22 December, 2018, 27-28 March, 2019 11-12 February, 2019	 
2.	Workshops on endophytes plant interactions were organised and faculty and scientist from different institute participated.	34	27-28 March, 2019	 

S. No.	Events	No. of Participants	Duration	Activity
3.	A total of 95 students participated in exposure visits to Zonal Agricultural Research Station, Mandya, East-West Seed Company and internship at Monsanto India limited, Kallinayakanahalli. In these programs students learnt emasculation techniques in different crops at commercial level.	95	3 September to 1 October, 2018	 
4.	Workshop on Principles and applications of genome editing for crop improvement	30	9-13 May, 2019	
5.	A workshop was conducted on "Modeling and ICT Applications in Forecasting Pest and Diseases: Current Status and Emerging Needs" with the objective to review state-of-art in coupling pest and disease models to crop models (144 participants from all over India participated). Resource person from North Carolina University, USA	144	12-13 February, 2019	 

CSAU&T, Kanpur

S. No.	Events	No. of participants	Duration	Activity
1.	One short course of seven days on protected cultivation of vegetable crops was organized in which 39 students from different universities participated.	Lecture delivered-30, Students Participated-39	12-18 March, 2019	
2.	Brainstorming Session - "Bio-fortification Towards Food Security-2019"	Lecture delivered-2, Students & Faculty Participated-87	21 February, 2019	
3.	Brainstorming Session:Advances in Organic Farming of Vegetables Under Protected Conditions	Lecture delivered-2, Students & Faculty Participated-51	25 February, 2019	

MPKV, Rahuri

S. No.	Events	No. of participants	Duration	Activity
1.	Inception workshop, Central Campus, MPKV, Rahuri,	76 faculty	15-17 July, 2018	
2.	One day workshop on social science course contents for PG Diploma, College of Agriculture, Pune	49 faculty	28 August, 2018	
3.	Student- Industry Interface on Application of Drone technology in Agriculture. College of Agriculture Pune	150 students 17 faculty	28 February, 2019	
4.	Student- Industry Interface on Application of Drone technology in Agriculture MPKV, Rahuri,	375 students 17 faculty	27 March, 2019	

S. No.	Events	No. of participants	Duration	Activity
5.	Student- Industry Interface on Robotics and Automation for Climate Smart Agriculture, MPKV, Rahuri,	250 students 11 faculty	28 March, 2019	
6.	Stakeholder workshop Agrio-climatic Networking at Shenit, Ta. Akole, Dist. Ahemadnagar under CAAST, MPKV, Rahuri,	100 farmers 7 faculty	9 April, 2019	
7.	Developing Village Level Contingency Crop Plan for Akole Block MPKV, Rahuri	10 farmers 50 faculty	20-21 June, 2019	
8.	Soil Health and Land Use Planning MPKV, Rahuri	3 farmers 45 faculty 56 students	4-5 July, 2019	

S. No.	Events	No. of participants	Duration	Activity
9.	A workshop on village level crop contingency plan organized at village Shenit, Tal: Akole was organized by CAAST-CSAWM, MPKV, Rahuri.	63 farmers 8 faculty	9 July, 2019	

IVRI, Izatnagar

S. No.	Events	No. of participants	Duration	Activity
1.	Participants of Interface-B2B meet with Industry, Academia, State AH Department and Milk Cooperative at TEC, Pune	70	17 December, 2018	
2.	Industry-Academia Interface Meet at ICAR-IVRI, ERS, Kolkata	50	7 December, 2018	

PAU, Ludhiana

S. No.	Events	No. of participants	Duration	Activity
1.	A Sensitization Workshop for all Co-PIs, associated scientists and faculty from the associated departments.	60	22 March, 2019	

BCKV, Mohanpur

S. No.	Events	Duration	Activity
1.	Arranged a large number (13) of interaction sessions with experts on conservation agriculture from across the country including ICAR institutes and other institutes (e.g., IIT, Kharagpur, CFRI, Dhanbad) as well as from abroad (Murdoch University, Australia) for empowering the appointed students and associated scientists of the centre on conservation agriculture.	22 June, 2019	

NAU, Navsari

S. No.	Events	No. of Participants	Duration	Activity
1.	Organized National Workshop on Pesticide Residue: Management and Techniques for Food Safety and Security at NAU, Navsari	250 delegates at	25-26 February, 2019	

S. No.	Events	No. of Participants	Duration	Activity
2.	Organized Skill Development Course on "Secondary Agriculture" About 32 Special Lectures were organized on different aspects of Skill Development in Secondary Agriculture during the period of 15 days training programme at NAU, Navsari.	25 PG students	20 March to 3 April, 2019	

C. LECTURE SERIES

CIFE, Mumbai

S. No.	Title	Name of Speaker	No. of participants	Date	Activity
1.	Inland Saline Aquaculture: A possible way to reclaim degraded soil	Dr. A. K. Reddy, Emeritus Scientist, ICAR-CIFE Mumbai	116	21 December, 2018	
2.	Resource utilisation efficiency: a key factor for sustainable aquaculture development	Dr. S. J. Kaushik, European Research Area Chair, Eco-Aqua France	86	15 January, 2019	
3.	Genomic tools and Genetic selection in Aquaculture	Dr. Rama Bangera, Senior Geneticist, Akvaforsk Genetics, Norway	15	17 January, 2019	

S. No.	Title	Name of Speaker	No. of participants	Date	Activity
4.	Energy efficient & innovative feed technology for sustainable aquaculture	Dr. Amararatne Yakupitiyage, Adjunct Faculty, Asian Institute of Technology, Thailand	49	21 January, 2019	
5.	Innovative and eco-friendly approaches in post-harvest management of fish	Dr. Soottawat Benjakul, Faculty of Agro-industry, Prince of Songkla University, Hat Yai, Songkhla, Thailand	46	21 January, 2019	
6.	Ecological function of aquatic ecosystem	Dr. R. S Srivastava Sr. Scientist & Officer-in-Charge ICAR-CIFRI, Regional Centre, Allahabad	60	14 March, 2019	
7.	Data visualization using Power BI	Mr. Anand Sinha Reporting Analyst, Maersk, GSC, Pune	26	16 March, 2019	

S. No.	Title	Name of Speaker	No. of participants	Date	Activity
8.	Status & Advancement in Shrimp Disease in Asia: It's Corporate Perspective	Dr. Rajeev Kumar Jha, Deputy Head CP Prima, Indonesia	51	8 June, 2019	
9.	Professional Fisheries Education: A focus on para fisheries professionals	Dr. Dilip Kumar, Ex-Director ICAR-CIFE, Mumbai	50	21 June, 2019	
10.	India's journey from food security to nutritional security	Prof. (Dr.) A.K. Srivastava, Member (Animal Science) ICAR-ASRB	210	10 July, 2019	

UAS, Bangalore

S. No.	Title	Name of Speaker	No. of participants	Date	Activity
1.	Tutorial on Scientific writing	Dr. Kiran Mysore, Adjunct Faculty, Nobel Research Institute, USA	90	6 July, 2019	

S. No.	Title	Name of Speaker	No. of participants	Date	Activity
2.	Molecular Approaches to manage Biotic and Abiotic Stresses	Dr. Kiran Mysore, Adjunct Faculty, Nobel Research Institute, USA	60	12 July, 2019	

PAU, Ludhiana

S. No.	Title	Name of Speaker	No. of participants	Date	Activity
1.	NAHEP CAAST PAU team with Honourable Vice Chancellor, Dr B.S. Dhillon (Padam Shri Awardee) and Nodal Officer Dr G.K. Sangha, Dean, Post Graduate Studies, PAU, Ludhiana in a planning meeting	Dr. B.S. Dhillon		4 April, 2019	
2.	Lecture on "Role of Soil Science Research in Natural Resource Conversation"	Dr. S. M. Virmani, Soil Scientist & Climatologist of International Fame & presently Honorary Adjunct Professor, PAU, Ludhiana	50	25 March, 2019	

S. No.	Title	Name of Speaker	No. of participants	Date	Activity
3.	Lecture on "Environmental pollution & Climate Change: Challenges and possible solutions"	Dr. M.S. Aulakh, Founder Vice-Chancellor, Banda University of Agriculture & technology, Banda (U.P.)	45	27 March, 2019	
4.	Lecture on "On-farm management of crop residues for improving soil health and environment quality"	Dr. Yadvinder Singh, FNA and INSA Honorary Scientist, PAU, Ludhiana	53	28 March, 2019	
5.	A lecture on "Matlab based Modeling, Simulation and Control of Robotic Manipulators"	Dr. Ashish Singla, Associate Professor, Department of Mechanical Engineering, Thapar Institute of Engineering and Technology	47	29 March, 2019	

IVRI, Izatnagar

S. No.	Title	Name of Speaker	No. of participants	Date	Activity
1.	"Advances and Challenges in recent drug discovery approaches"	Dr Rituraj Konwar Scientist-F, CDRI, Lucknow	75	23 March, 2019	
2.	"Avian paramyxo virus, friend or foe"	Dr Sachin Kumar, Associate Prof, IIT-Guwahati	75	23 March, 2019	

CSAUA&T, Kanpur

S. No.	Title	Name of Speaker	Participants	Activity
1.	Six student mentoring lectures series were organized in which eminent scientists/ scholar from different institutions delivered mentoring lectures	Padma Shri Prof. Brahma Singh, Ex Director DRDO, Dr Kaushlendra Singh, RSAC, Lucknow, Dr Dushwant Mishra, IIFSR, Meerut, Dr Ghanshyam Pandey, CISH, Lucknow	185	

MPKV, Rahuri

S. No.	Title	No. of participants	Date	Activity
1.	Guest lecture on Management of Export Oriented Protected Cultivation, College of Agriculture, Pune	50 students 8 faculty	26 February, 2019	
2.	Guest lecture on Application of Micro-Irrigation Technology in Crop Water Management, College of Agriculture, Pune	75 students 5 faculty	27 February, 2019	

NAU, Navsari

S. No.	Title	Name of Speaker	No. of participants	Date	Activity
1.	"TBOs: Significance, Status of Processing and Product Diversification in India"	Prof. Balakrishna Gowda Former Professor, UAS, GKVK, and Consultant-Agroforestry and Biofuels, Bengaluru	50	3 July, 2019	

S. No.	Title	Name of Speaker	No. of participants	Date	Activity
2.	"Next generation technologies in processing and value addition of MAPs"	Dr. Minoo Prabia Retd. Professor & Head, Dept. of Biosciences, Veer Narmad South Gujarat University, Surat	50	3 July, 2019	
3.	MAPs: Importance, Processing, Value Addition and Product Diversification	Dr. M. Vasundhara Former Professor & HoD, Dept of Horticulture, UAS, Bengaluru	68	16 July, 2019	
4.	Value Addition, Processing of Non-Timber Forest Products (NTFPs)	Dr. D. Nuthan, Former Associate Director of Research, UAS, GKVK Campus, Bengaluru	65	16 July, 2019	

BCKV, Mohanpur

S. No.	Title	Name of Speaker	No. of participants	Date	Activity
1.	Conservation agriculture	Dr. Himanshu Pathak	35	1 October, 2018	
2.	About the project on conservation agriculture	Dr. P.K. Ghosh	38	5 October, 2018	
3.	Soil and water resources in coastal region of India and its management for higher agricultural productivity.	Dr. Dhiman Barman	36	2 January, 2019	

S. No.	Title	Name of Speaker	No. of participants	Date	Activity
4.	Field visit and inputs for improvement	Dr. P.K. Chakrabarty	32	11 January, 2019	
5.	Soil and water management in India: issues, challenges, strategies and way forward	Dr. S.K. Chaudhuri	35	15 January, 2019	
6.	Prioritising areas for soil carbon sequestration: a step for conservation agriculture	Dr. Tapas Bhattacharya	38	13 March, 2019	

S. No.	Title	Name of Speaker	No. of participants	Date	Activity
7.	Microorganisms in conservation agriculture	Dr. T.K. Adhya	30	25 March, 2019	
8.	Scope of conservation agriculture	Dr. A. K. Singh	38	26 March, 2019	
9.	Conservation agriculture	Dr. C. L. Acharya	33	28 March, 2019	

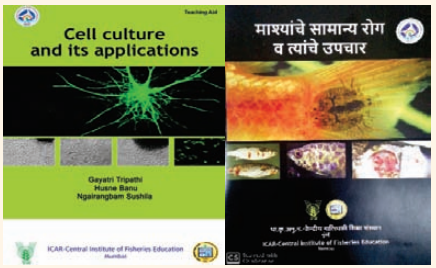
S. No.	Title	Name of Speaker	No. of participants	Date	Activity
10.	Soil carbon sequestration for sustainable agriculture	Dr. D. K. Benbi	36	29 March, 2019	
11.	Soil quality, carbon sequestration and human health studies in coal mining ecosystem	Dr. R. Masto	38	29 March, 2019	
12.	Conservation horticulture practices and carbon sequestration under mango based cropping system	Dr. A. Ganeshamurthy	35	9 April, 2019	

S. No.	Title	Name of Speaker	No. of participants	Date	Activity
13.	Sustainable agriculture	Dr. Richard W. Bell	40	21 June, 2019	
14.	*Trichoderma* for plant disease management- a gift of God to humankind	Prof. A. N. Mukhopadhyay	37	18 July, 2019	

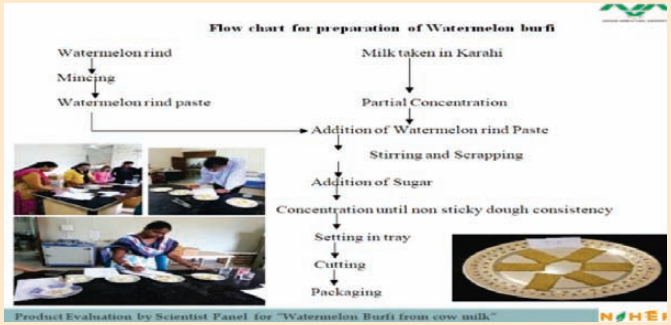
D. INNOVATIONS / OUT OF BOX INITIATIVES

I. Scientific Educational Material Generated in Laboratory/Classroom

CIFE, Mumbai

S. No.	Innovation	Date	Activity
1.	A Mobile Application **'mJhinga',** on Inland Saline Shrimp Aquaculture launched on ICAR-CIFEs' Annual Day programme. **Available on** Google Play Store @ http://bit.ly/cifeapp	6 June, 2019	
2.	Innovative value-added products using Inland saline reared shrimps and fish have been prepared at Post-harvest laboratory of ICAR-CIFE Prawn Pickle Fish Pickle Fish Chakli Fish Papad Fish Sev Fish Wafers	6 June, 2019	
3.	A Teaching aid on "Cell Culture and its Applications" and a Technical Bulletin in Marathi on "Ornamental fish diseases and their control measures" were released	27 April, 2019	

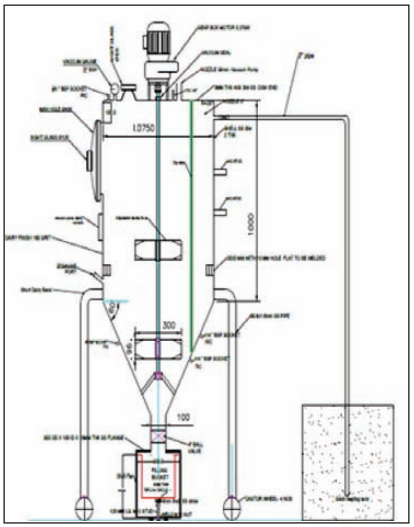
NAU, Navsari

S. No.	Innovation Product	Date/Period	Activity
1.	Sapota Fruit base Ice-cream	February, 2019	
2.	Watermelon Burfi from cow milk	September, 2018	
3.	Fancy Wooden Decorates	February, 2018 -July, 2019	

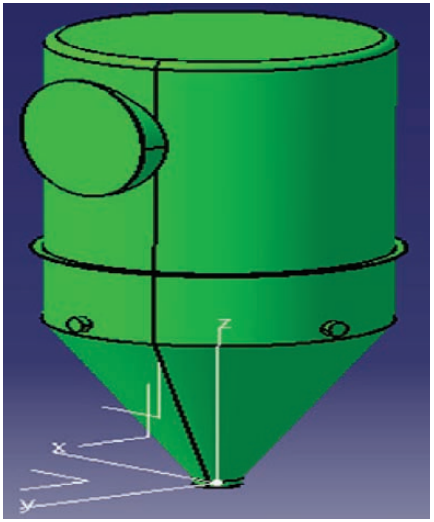
UAS, Bangalore

Sub-Baric Food Grain Storage Bin

Sub-baric storage method involves (manually or automatically) placing food grains in a storage structure, removing air from inside and sealing. The intent of vacuum storage is usually to remove oxygen from the container to extend the shelf-life of food grains. Vacuum storage reduces atmospheric oxygen, limiting the growth of aerobic bacteria or fungi, and preventing the evaporation of volatile components. The sub-baric storage bin can be used for storage of cereals, pulses and oil seeds for extension of shelf-life of food grains.



P&I Drawing

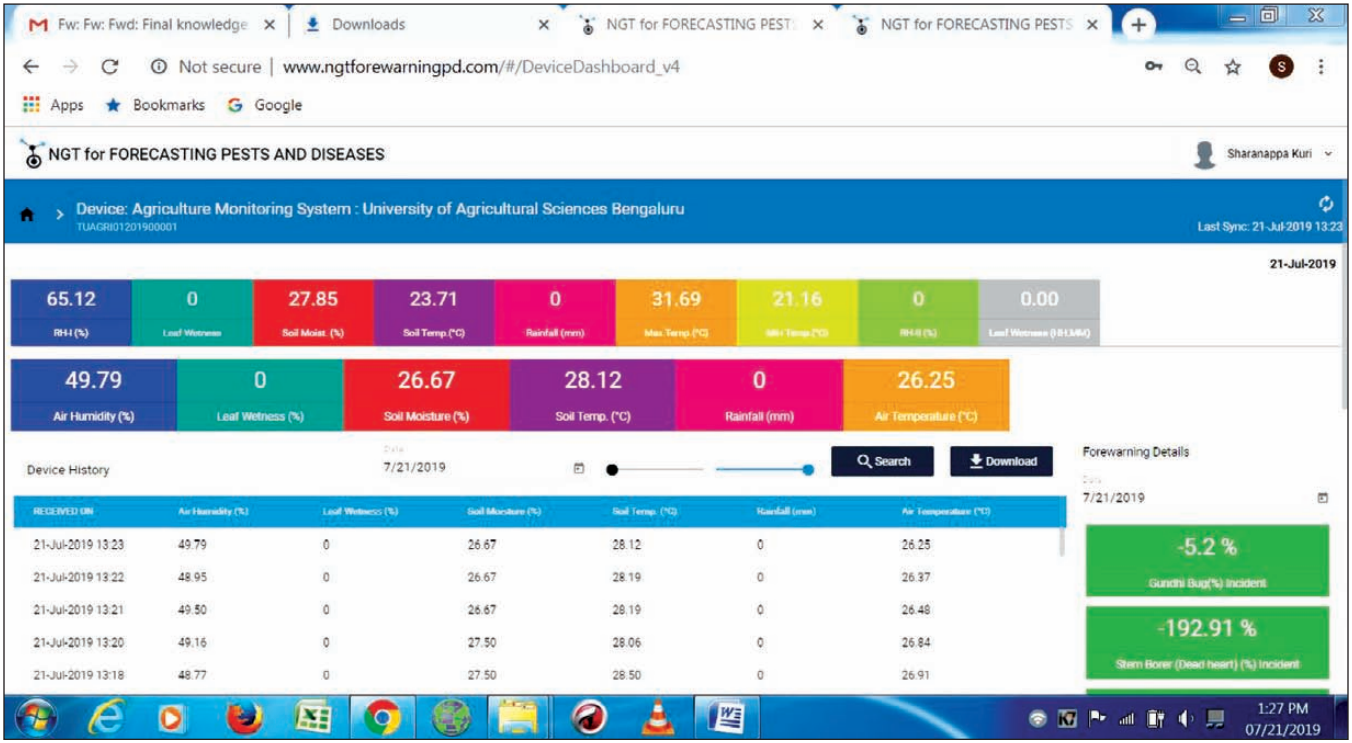


3D Model

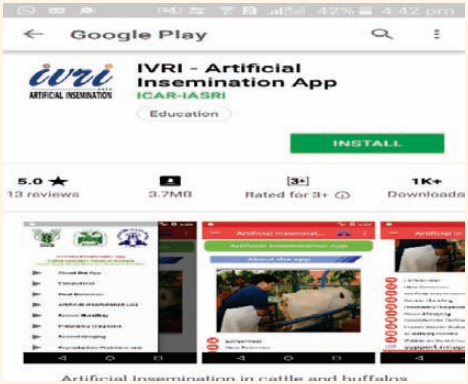
Sub-Boric Grain Storage Bin

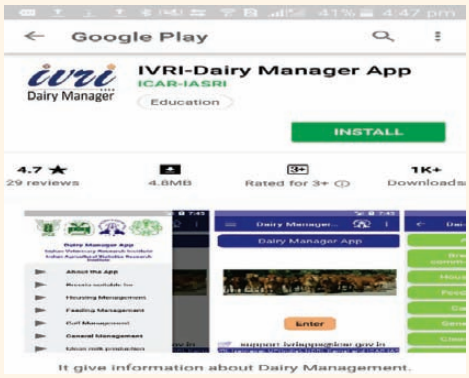
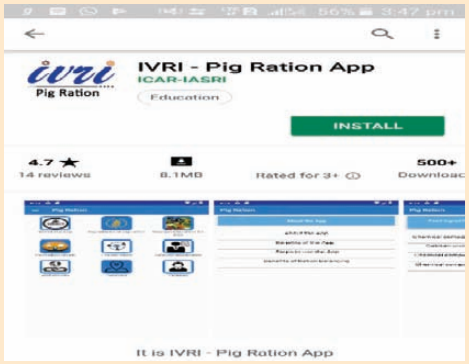
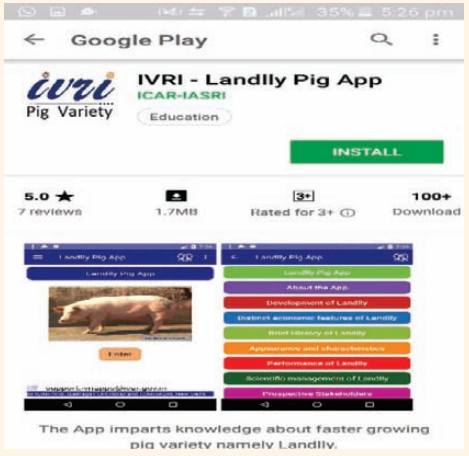
Forewarning Web portal

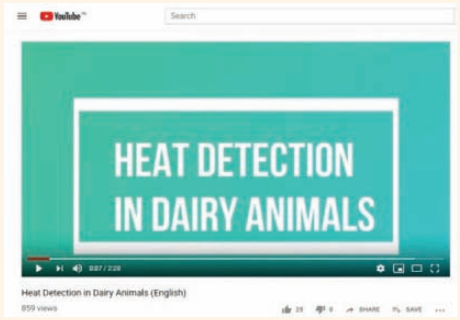
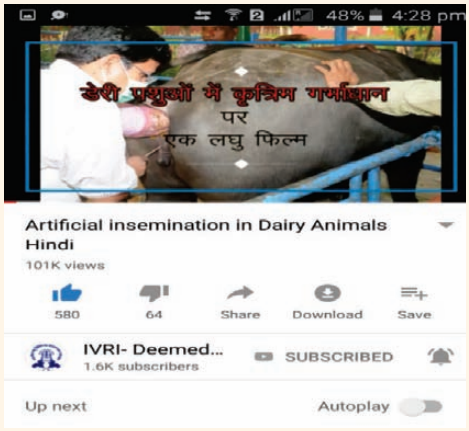
Web portal has been developed to obtain weather data from the field and rule based forecasting model has been made online for rice blast disease and stem borer.

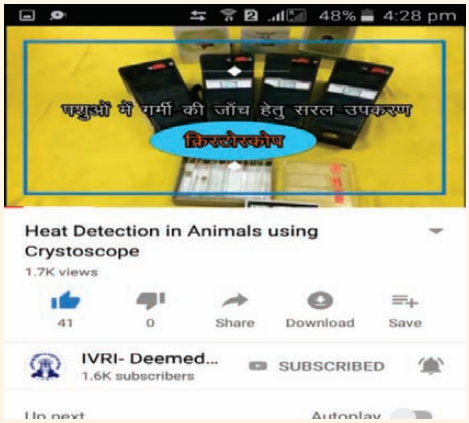


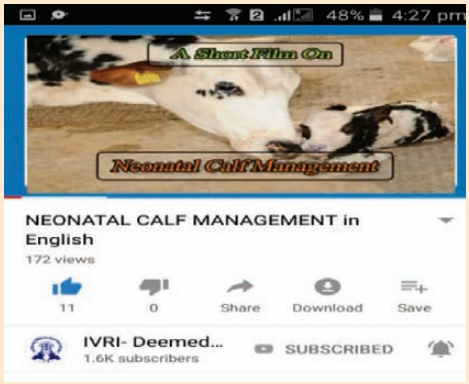
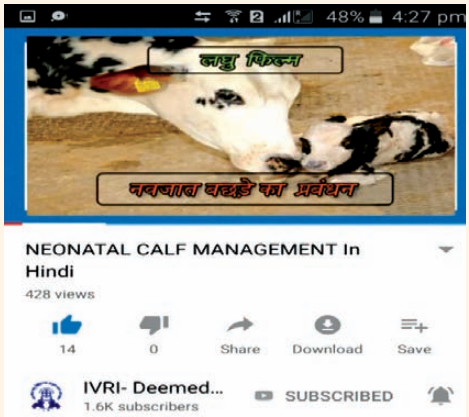
IVRI, Izatnagar

S. No.	Innovation	Date	Activity
Mobile App			
1.	IVRI-Shukar Palan (Pig Farming) App https://play.google.com/store/apps/details?id=com.icar.ivri.pig_app&hl=en_IN	22 January, 2018	
2.	IVRI –Artificial Insemination App https://play.google.com/store/apps/details?id=com.ivri.iasri.aiapp	6 March, 2018	
3.	IVRI-Vaccination Guide app https://play.google.com/store/apps/details?id=com.icar.ivri.iasri.vcguideapp	22 November, 2018	

S. No.	Innovation	Date	Activity
4.	IVRI Dairy Manager https://play.google.com/store/apps/details?id=com.ivri.iasri.dmapp	31 May, 2018	
5.	IVRI Pig ration https://play.google.com/store/apps/details?id=icar.iasri.ivri.pigration	27 September, 2018	
6.	IVRI-Landlly pig https://play.google.com/store/apps/details?id=com.ivri.iasri.landlypig	10 April, 2018	

S. No.	Innovation	Date	Activity
Educational Video			
7.	Heat Detection in Dairy Animals (English) Various techniques of Detecting heat in dairy animals (cattle and buffaloes) are shown in this video having https://youtu.be/UDaT0i4JjpI	1 November, 2018	
8.	Artificial Insemination in Dairy Animals (English) This video shows the various steps involved in performing an accurate and effective Artificial Insemination in dairy animals having 2829 views. https://youtu.be/f2YTB1UYvZ4	21 March, 2018	
9.	Artificial Insemination in Dairy Animals (Hindi) This video shows the various steps involved in performing an accurate and effective Artificial Insemination in dairy animals which is in Hindi language having 127741 views https://youtu.be/flCHtw1xMDg	21 March, 2018	

S. No.	Innovation	Date	Activity
10.	Heat Detection in animals Using Crystoscope (English) This video gives the information and operation of Crystoscope (developed by IVRI) which can be used for effective heat detection in animals by checking the fern pattern of cervical mucus having 831 views https://youtu.be/iR6WIYEXvYg	21 March, 2018	
11.	Heat Detection in animals Using Crystoscope (Hindi) This video gives the information and operation of Crystoscope (developed by IVRI) in Hindi which can be used for effective heat detection in animals by checking the fern pattern of cervical mucus and tells about operating procedure of the instrument having 1957 views https://youtu.be/9bgsuPrWQ_Y	21 March, 2018	
12.	Clean milk production (English) This video demonstrate steps to be undertaken in clean milk product 1393views https://youtu.be/dl9dag5VUcA	1 June, 2018	

S. No.	Innovation	Date	Activity
13.	Clean milk production (Hindi) This video demonstrate steps to be undertaken in clean milk production in hindi 2101 views https://youtu.be/oKfymBSvUQ4	1 June, 2018	
14.	Neonatal calf Management (English) This video shows the scientific recommended practices for neonatal calf management 191views https://youtu.be/wXSHzzz9RpI	2 July, 2018	
15.	Neonatal Calf Management (Hindi) This video shows the scientific recommended practices for neonatal calf management (in Hindi language) 507 views https://youtu.be/OmgnEGyZNg8	26 July, 2018	

The new PG course curriculum "Epidemiology of AMR and its mitigation strategies" Principles of Biosafety and Biosecurity – Theory, Advances in Synthetic Peptide Technology – Theory have been designed for PG students.

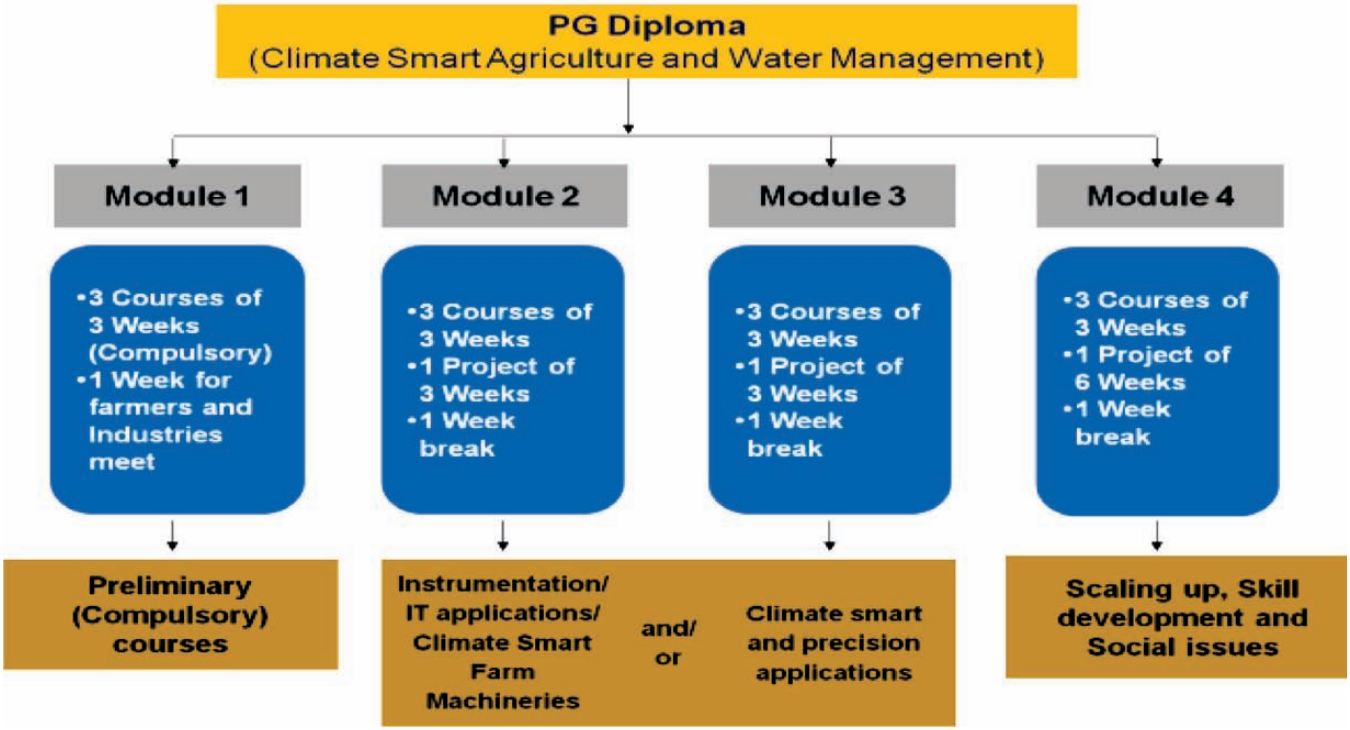
Development of E-content of PG courses

S. No.	Name of course	Discipline	MVSc/PhD	Course Content Developed
1.	Advances in Protein Engineering	Animal Biotechnology	MVSc/PhD	Lecture-wise PPTs of these course contents are being developed in progress
2.	Epidemiology of AMR and its mitigation strategies	Veterinary Public Health & Epidemiology	MVSc/PhD	
3.	Important reproductive facets of livestock	Veterianry Gynaecology	MVSc/PhD	

MPKV, Rahuri

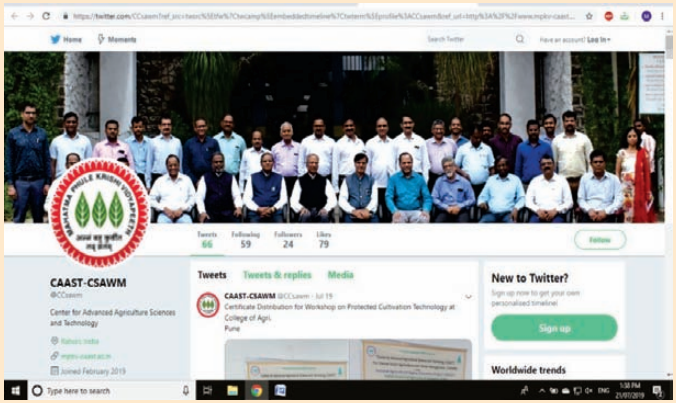
Diploma and Certificate courses on Climate Smart Agriculture and Water Management

The Diploma course in Climate Smart Agriculture and Water Management is designed for one-year (52 weeks) period and will start from august 2019. This is composed of a series of lectures, subsequent practicals, field and industry visits, case studies, group projects and individual projects. The Diploma program includes four modules of 3 months duration each and having different courses of 3 weeks duration each in relation to agricultural sciences, engineering, and social sciences. There are plenty of options to the students to choose from total 54 courses developed in agriculture, engineering, and social science fields. The developed diploma and certificate programs will provide student participants and practitioners up-to-date knowledge about CSA and WM, demonstrate the opportunities, challenges, and trade-offs.

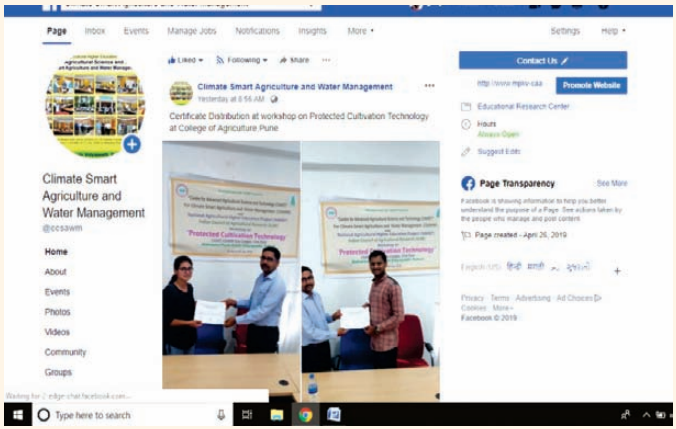


Web designing

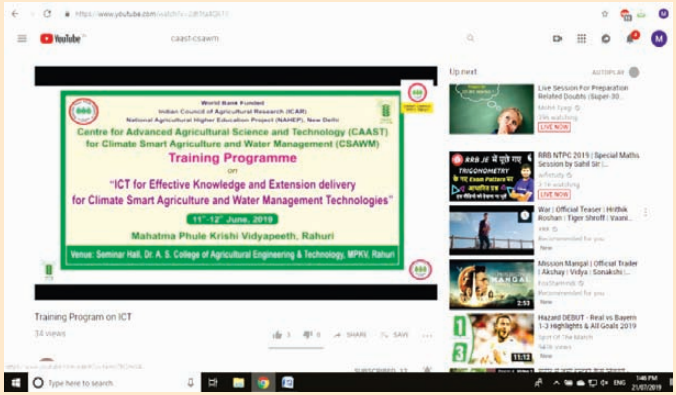
Development of Web based content management system using MVC, HTML 5, CSS, and JQuery.
www.mpkv-caast.ac.in



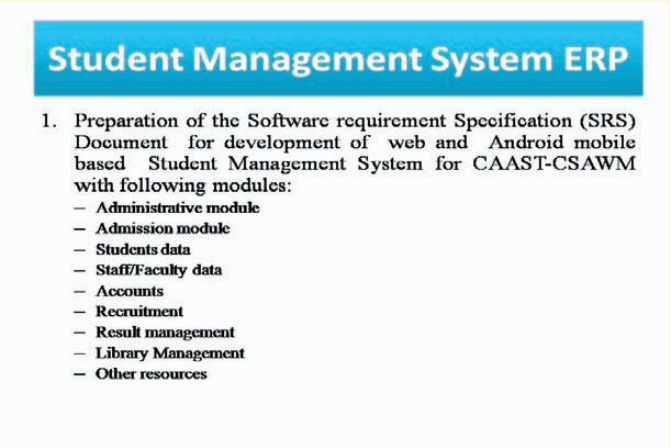
Creation of official Twitter page to disseminate the useful information about the CAAST-CSAWM activities.



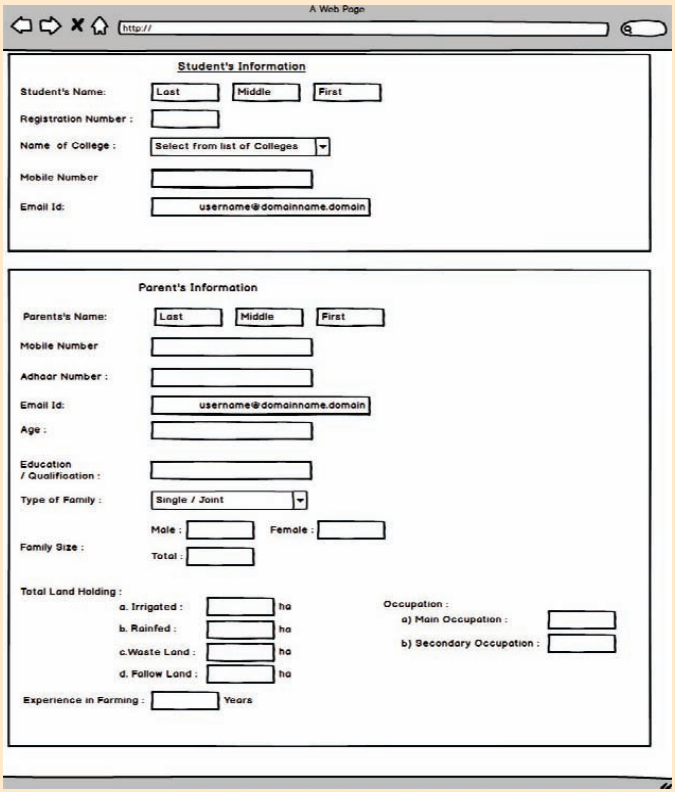
Creation of official Facebook page to disseminate the useful information about the CAAST-CSAWM activities.



Creation of official Youtube Channel page to disseminate the useful information about the CAAST-CSAWM activities.



Development of "Web and Android Mobile based Student Management System ERP" for the management of different activities from admission to result declaration of the courses under CAAST-CSAWM.



Design and development of Android and Web based platform for data collection and advisory to parents of MPKV students under doubling farmer's income theme under CAAST-CSAWM

BCKV, Mohanpur

Formulated and offered three specialized courses on conservation agriculture for the Ph.D. and M.Sc./M. Tech. students working on different thematic areas of the centre.

- Natural Resource Management through Conservation Agriculture (Credit : 2L+2P)
- Crop Sciences in Conservation Agriculture (Credit : 2L + 1P)
- Participatory Methods for Analyzing Social Ecology, Status and Trend of Conservation Agriculture Technology, Evaluation and Transfer (Credit : 2L + 1P)

II. Scientific Educational Material Generated in Field

MPKV, Rahuri

A Phule Soil Moisture Sensor Based Irrigation Scheduler

Soil moisture sensors are good source for monitoring spatial and temporal variation of soil moisture and hence can be an effective tool for precise irrigation scheduling. Under CAAST activity at rahuri has been developed the sensors to remotely monitor in-situ soil moisture in the root zone by using the technologies like internet of things (IoT) and data loggers. The developed soil moisture sensors have been further integrated with Web Application which calculates the water requirement according to sensed soil moisture from the sensors. This scheduler is designed in such a way that it is beinged used by the farmers and practioners for the real time irrigation scheduling and by the students as an education tool to know how the soil moisture varies as per soil, crop conditions and irrigation event; and how the irrigation schedule depend on the soil, crop and other related conditions.

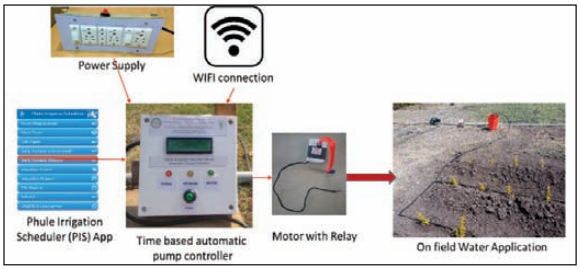
The prototypes of these tools are provided to the Dr. A. S. College of Agril. Engineering and Technology, Rahuri; Post Graduate Institute, Rahuri; College of Agriculture, Pune/Dhule and Kolahpur for use by the students.

Application of Phule Soil Moisture Sensor in the field

Spraying demonstration on horticultural and wheat crops through drone-mounted sprayer

Phule Irrigation Scheduler based Automatic Pump Controller (IoT)

Phule Irrigation scheduler based automatic pump controller in context of farmer's perspective. For the farmers use, farmer has to download the Phule Irrigation Scheduler (PIS) android mobile app from google play store. Then register the farm and provide other details. PIS app will estimate the amount of water to be applied and specified duration of time for which the pump is to be operated. If farmer triggers from the mobile app PIS to start the pump, this estimated time duration will be fed automatically to the Pump Controller and motor will start for this specified duration. Once the time duration elapsed, the motor will automatically stop. Thus the working operation of Phule Irrigation Scheduler Based Automatic Pump Controller is simple and convenient for farmers



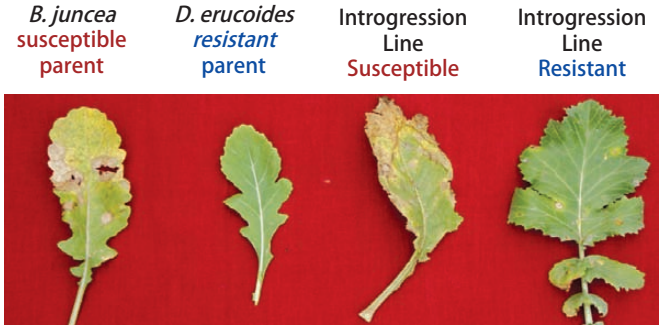
Field Demonstration under Techno-week

IARI, New Delhi

Research output of Ph.D. Students

Introgression of Alternaria blight resistance in to mustard from B. rapa x D. erucoides

Introgression lines of mustard (*Brassica juncea*) were developed from a cross between mustad and *B. rapa* x *D. erucoides*. Real-time RT-PCR expression study showed that defense related genes (PR3 & 5) are highly induced in the resistant introgression lines mustard upon Alternaria inoculation. These ILs will be useful in breeding for mustard cultivars resistant to Alternaria blight.



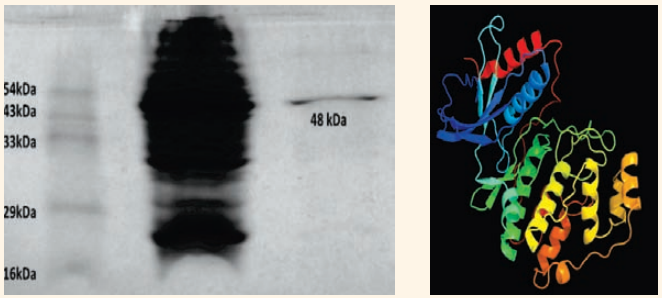
B. juncea introgression lines resistant to Alternaria were identified

Microbial Genomics

Whole genome sequencing of *B. paralicheniformis* strain KMS 80 was accomplished. The total size of the assembly was 4.5MB and assembled in to 83 scafolds. Genome annoatation led to the identification of about 4557 genes. Twenty one genes involved in nitrogen metabolism pathway were identified. Two transcription factors from the whole genome of *B. paralicheniformis* strain KMS 80 identified as CDS_3675 (glnR) in the scaffold-3 and CDS_507 (tnrA) in the scaffold-1, which regulates the expression of N-fixation genes in response to changes in nitrogen availability.

Cloning and characterization of genes involved in stress signalling

Mitogen-activated protein kinase (MAPK) signalling plays key role in tolerance of plants to biotic and abiotic In wheat, 64 transcripts coding for MAPKs were identified using *de novo* transcriptomic approach. Developmental stage specific expression analysis under heat stress showed that higher levels of MAPK expression at mealy-ripe stage as compared to milky-ripe stage. Higher levels of expression were observed maximum in thermo tolerant cvs. HD3059 and Halna as compared with thermo sensitive cv. HD2329 and PBW550under differential heat stress.



Cloning and Characterization of MAPK from bread wheat. A) Expression and purification of recombinant TaMAPK in E.coli. B) 3D structure of TaMAPK

IVRI, Izatnagar

Research output of PG Students

DIVA-compatible negative marker vaccine for FMD

FMDVA 40/2000: RT-PCR amplificawas carried-out and amplicon was cloned to make (complete genome length clone. The recombinant clone was characterized by sequence analysis and the sequence identity with the parent virus by nucleotide sequencing was carried-out. Infectious RNA from the linearised clone was generated through in vitro transcription.

FMDV Asia1 63/72: A deletion mutant of FMDV Asia1 63/72 vaccine strain infectious cDNA was generated by deleting C-terminal NSP3A gene by site directed mutagenesis PCR. The plasmid constructs were confirmed by sequencing. In vitro transcribed RNA of the partial 3A deleted constructs was transfected in T-7BSR cells.

DIVA enabled Brucella vaccine for cattle/buffalo

Brucellaabortus Strain 19 was modified by deletion of perosaminesynthetase gene and named as S19 Δ per strain. S19 Δ per was found to be attenuated in miceand conferred protection in immunized mice against challenge with virulent *B. abortus* 544. Further,The preclinical toxicity testing of S19 Δ peris under way for which in 12 guinea pigs have been procured from LAR section, IVRI and screened for for reactivity to RBPT antigen. None of the animal sera showed agglutination reaction and were found negative for *Brucella* infection. Bacterial culture S19 Δ per has been revived and tested for Brucella specific primers. After confirmation of identity of the bacteria, S19 Δ per was grown in Brucella broth with supplementation of antibiotics – CITA and kanamycin. Enumeration of bacterial culture was done by 10-fold serial dilution. Dose for preclinical toxicity analysis has been optimised.

CSAUA&T, Kanpur

Modernization of poly houses for strengthening capacity building and research programmes of students & faculty under NAHEP- CAAST

BCKV, Mohanpur

Research output of PG Students

S. No.	Initiative undertaken	Activity	
1.	Established a demonstration unit on CA in the University Farm.		
2.	Student analysing samples of their research materials		
3.	Included of horticultural crops under conservation agriculture		

S. No.	Initiative undertaken	Activity
4.	Installed of solar energy driven micro irrigation system and operation of 10 HP pump using solar energy	

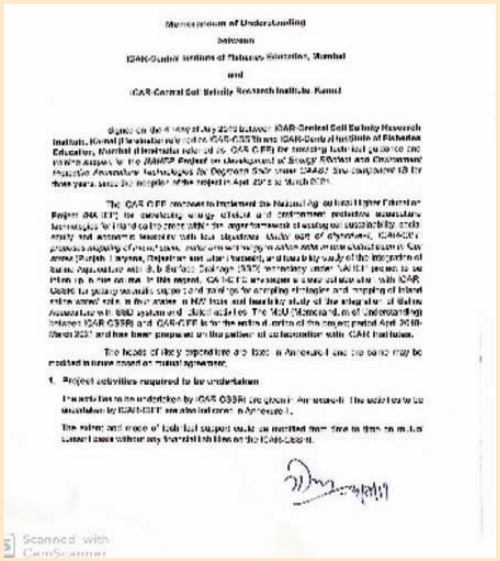
E. COLLABORATIONS / MOUs WITH INDUSTRY / HIGHER EDUCATIONAL INSTITUTIONS

CIFE, Mumbai

MOU signed with Industry and Other Organisation

An MOU was signed with West-Coast Frozen Foods Pvt. Ltd. regarding possibilities of technology transfer in the field. Forty-Eight Foreign Universities and 14 National Universities were identified to initiate a formal collaboration.

S. No.	Institute	Purpose	Activity
1.	The Commonwealth Scientific and Industrial Research Organization (CSIRO), Australia	International training for capacity building of students and faculties for research and education	 Letter of Intent between Central Institute of Fisheries Education (CIFE) – Indian Council of Agricultural Research (ICAR) of Panch Marg, Off. Yari Road, Versova, Andheri (West), Mumbai 400 061 and The Commonwealth Scientific and Industrial Research Organisation, of Black Mountain Science and Innovation Park, Clunies Ross Street, Acton ACT, 2601, Australia for Furthering Scientific Cooperation 1. The Central Institute of Fisheries Education (CIFE - ICAR) and the Commonwealth Scientific and Industrial Research Organisation, Australia (hereinafter referred to as "the Sides") enter into this Letter of Intent (LOI) to encourage collaboration in areas of mutual interest and benefit to both Sides. Based on the principles of equality and reciprocity, this LOI serves as a general framework for cooperation between the two Sides and is intended to facilitate discussions for more specific
2.	The Energy and Resources Institute (TERI), New Delhi	Collaboration in energy efficient systems for inland saline areas being used for aquaculture	

S. No.	Institute	Purpose	Activity
3.	West-Coast Frozen Foods Pvt. Ltd, Surat, Gujarat	Technology transfer possibilities in the field of Fisheries	
4.	ICAR- Central Soil Salinity Research Institute, Karnal, Haryana	Training and capacity building for students and faculty	
5.	Asian Institute of Technology, Bangkok, Thailand	International training for capacity building of students and faculties for research, education and development	-
6.	French National Institute for Agricultural Research (INRA), France	International training for capacity building of students and faculties for research and education	-

MPKV, Rahuri

MOU signed with Educational institutes at final stage

S. No.	Institute	Purpose
1.	Washington State University, Pullman, WA, USA	International training for capacity building of MPKV faculties; research and education
2.	Mississippi State University, Starkville, MS, USA	International training for capacity building of MPKV faculties; research and education
3.	Asian Institute of Technology, Bangkok, Thailand	International training for capacity building of MPKV faculties; research and education
4.	International Water Management Institutes (IWMI), Colombo, Sri Lanka	Collaborative research related to water management techniques in climate smart agriculture, trainings on capacity building
5.	Indian Institute of Technology (IITB), Powai, Mumbai	Collaborative research on Micrometeorology, Data sharing of Eddy Covariance Tower,

MOU signed with Research Organisations/NGOs/Banks in progress

S. No.	Organisation	Purpose
1.	BIAF Development Research Foundation, Warje, Pune 411058	Village level contingency crop planning, data-exchange and trainings on capacity building
2.	Indian Institute of Remote Sensing (IIRS), Dehradun	Trainings on capacity building for faculties, collaborative research work on RS- GIS, teaching and learning
3.	National Institute of Abiotic Stress Management (NIASM), Malegaon (Kh), Baramati	Trainings on capacity building for students and collaborative research related to climate smart agriculture, teaching and learning
4.	Central Research Institute for Dryland Agriculture (CRIDA), Hyderabad	District, Block and Village level contingency crop planning, compilation and incorporation, suggestions, modifications and trainings on capacity building, teaching and learning
5.	National Bureau of Soil Science and Land Use Planning (NBSS and LUP), Nagpur	Trainings on capacity building for students, collaborative research related to Natural Resource Management, Data sharing, teaching and learning
6.	Indian Meteorological Department (IMD), Pune	Weather based agro advisory documentation, Agrometeorological data sharing, Forecasting for preparation of advisory

S. No.	Organisation	Purpose
7.	Maharashtra Remote Sensing Application Centre (MRSAC), Nagpur	Trainings on capacity building for students, collaborative research work on RS- GIS
8.	Water and Land Management Institute, Aurangabad	Capacity building for water management in climate smart agriculture
9.	Watershed Organisation Trust (WOTR), Pune	Collaborative research on climate smart agriculture, documentation of weather based agro advisory for management of major field crop
10.	Grass Roots Action for Social Participation (GRASP), Aurangabad	Trainings on capacity building for students and farmers, Collaborative work on development of climate smart villages
11.	Lupin, Pune	Collaborative work on development of climate smart villages with IoT
12.	National Bank For Agriculture And Rural Development (NABARD), Pune	Capacity building and partnership in need based research

MOU signed with Industries initiated

S. No.	Organisation	Purpose
1.	KisanHub, St John's Innovation Centre, Cambridge, United Kingdom.	Digital Assets Mapping of MPKV, Rahuri and course content developments
2.	In-tech Harness Pvt. Ltd., A-6, Rane Classic, Someshwarwadi, PUNE Pune MH 411008 IN	To do collaborative research work in IoTs (e.g. Pump controller)
3.	AECOM, USA based multinational (industry partner)	Trainings on capacity building for students
4.	Climate Change Agriculture and Food Security, CCAFS (CGAIR Organization)	Collaborative research on weather modification and climate change
5.	Sahyadri –Agro, Nashik	Trainings to students and farmers based on Processing of agro products
6.	Netafim Irrigation, Pune	To do collaborative research work in water management, training for students
7.	Jain Irrigation Systems Limited, Jalgaon	Trainings on capacity building for students and farmers, collaborative research related to micro irrigation.
8.	Innosapien Agro. Technologies Pvt. Ltd.	Trainings on capacity building for students related to IOT application in agriculture, to do collaborative research related to IOT
9.	Quantela, Banglore	Trainings on capacity building for students

UAS, Bangalore

MOU signed with Institutions at final stage

S. No.	Institute	Purpose
1.	ICRISAT, Patencheru, Hyderabad	Student research and collaboration
2.	Monsanto India Ltd. Bengaluru	Student research and internship training
3.	CortevaAgriscience,Kallinayakanahalli, Gowribidanur, Karnataka	Student research and internship training
4.	AVRDC (WVC), Thaiwan	Research collaboration
5.	IARI New Delhi	Staff and student training
6.	North Caroline State University, North Caroline, USA	Student and faculty exchange; exposure visits; ;, Short and midterm trainings for students and faculty; Collaborative research on the topics of mutual interest
7.	Friedrich-Schiller-University Jena, Durenberger Str. 159 07743 Jena, Germany	Student and faculty exchange; exposure visits; ;, Short and midterm trainings for students and faculty; Collaborative research on the topics of mutual interest
8.	Chandra Shekar Azad University of Agriculture & Technology, Kanpur	Student and faculty exchange programme
9.	Jain Irrigation Jain Plastic Park Jalgaon, Maharashtra	Technology transfer and training

CSAUA&T, Kanpur

MOU signed with International Institutions

S. No.	Institute	Purpose
1.	Kasetsart University Bangkhen, Bangkok, Thailand	International training for Capacity building of CSAUA&T, Kanpur Faculties & M.Sc. Ag. /Ph.D. students, research and innovation and faculty exchange programme
2.	World Vegetable Centre Shanhua, Tainan, Taiwan	International training for Capacity building of CSAUA&T, Kanpur Faculties & M.Sc. Ag. /Ph.D. students, research and innovation and faculty exchange programme

S. No.	Institute	Purpose
3.	Hebrew University of Jerusalem, Israel	International training for Capacity building of CSAUA&T, Kanpur Faculties & M.Sc. Ag. /Ph.D. students, research and innovation and faculty exchange programme
4.	Wageningen University & Research, Wageningen Netherland	International training for Capacity building of CSAUA&T, Kanpur Faculties & M.Sc. Ag. /Ph.D. students, research and innovation and faculty exchange programme

MoU signing ceremony at Kasetsart University Bangkhen, Bangkok, Thailand

MoU signing ceremony at National Institute of Food Technology Entrepreneurship and Management, Sonepat, Haryana

MOU signed with National Institutions

S. No.	Institute	Purpose
1.	National Institute of Food Technology Entrepreneurship and Management, Sonepat, Haryana	Capacity building of CSAUA&T, Kanpur Faculties & M.Sc. Ag. /Ph.D. students, research and innovation and faculty exchange programme
2.	CSIR-Central Food Technology Research Institute Mysuru	Capacity building of CSAUA&T, Kanpur Faculties & M.Sc. Ag. /Ph.D. students, research and innovation and faculty exchange programme
3.	University of Agricultural Science, GKVK, Bangalore-Karnataka	Capacity building of CSAUA&T, Kanpur Faculties & M.Sc. Ag. /Ph.D. students, research and innovation and faculty exchange programme
4.	ICAR-Indian Institute of Seed Science, Mau	Capacity building of CSAUA&T, Kanpur Faculties & M.Sc. Ag. /Ph.D. students, research and innovation and faculty exchange programme

S. No.	Institute	Purpose
5.	ICAR-Central Institute of Post Harvest Engineering & Technology, Ludhiana -Panjab	Capacity building of CSAUA&T, Kanpur Faculties & M.Sc. Ag. /Ph.D. students, research and innovation and faculty exchange programme
6.	Indian Agricultural ResearchInstitute, Pusa Campus, New Delhi	Capacity building of CSAUA&T, Kanpur Faculties & M.Sc. Ag. /Ph.D. students, research and innovation and faculty exchange programme
7.	ICAR-Indian Institute of Vegetable Research Varanasi	Capacity building of CSAUA&T, Kanpur Faculties & M.Sc. Ag. /Ph.D. students, research and innovation and faculty exchange programme
8.	ICAR-Indian Institute of Vegetable Research Varanasi	Capacity building of CSAUA&T, Kanpur Faculties & M.Sc. Ag. /Ph.D. students, research and innovation and faculty exchange programme
9.	ICAR-Indian Institute of Millets Research, Rajendranagar, Hyderabad	Capacity building of CSAUA&T, Kanpur Faculties & M.Sc. Ag. /Ph.D. students, research and innovation and faculty exchange programme

MOU signed with Research Organization's/NGOs/Banks

S. No.	Organization	Purpose
1.	Sun Agro Biotech Research Centre Chennai-Tamil Nadu	R&D activity for faculty and M.Sc. Ag/Ph.D. Students
		
2.	MoU signing ceremony with Sun Agro Biotech Research Centre Chennai-Tamil Nadu at CSAUA&T, Kanpur	

BCKV, Mohanpur

MOU signed with International Institutions

S. No.	Institute	Purpose
1.	University of Florida, USA	Training of faculty and students through visiting scientist and sandwich Ph.D. programme
2.	Murdoch University, Australia	Training of faculty and students through visiting scientist and sandwich Ph.D. programme
3.	University of Natural Resources and Life Sciences, Vienna, Austria	Training of faculty and students through visiting scientist and sandwich Ph.D. programme
4	University of Milan, Italy	Training of faculty and students through visiting scientist and sandwich Ph.D. programme
5.	Texas A&M University, USA	Training of faculty and students through visiting scientist and sandwich Ph.D. programme
6.	University of Kentucky, USA	Training of faculty and students through visiting scientist and sandwich Ph.D. programme
7.	Kansas State University, USA	Training of faculty and students through visiting scientist and sandwich Ph.D. programme
8.	University of Wisconsin, USA	Training of faculty and students through visiting scientist and sandwich Ph.D. programme
9.	The Ohio State University, USA	Training of faculty and students through visiting scientist and sandwich Ph.D. programme
10.	Wageningen University, Netherland	Training of faculty and students through visiting scientist and sandwich Ph.D. programme
11.	UC Davis, Cornell, USA	Training of faculty and students through visiting scientist and sandwich Ph.D. programme

MOU signed with National Institutions

S. No.	Institute	Purpose
1.	ICAR-Central Soil Salinity Research Institute, Karnal, Haryana	Training of faculty and M.Sc./M.Tech. students through short visits.
2.	ICAR-Indian Agricultural Research Institute, Pusa, New Delhi	Training of faculty and M.Sc./M.Tech. students through short visits.

S. No.	Institute	Purpose
3.	ICAR- Indian Institute of Soil Science, Bhopal, Madhya Pradesh	Training of faculty and M.Sc./M.Tech. students through short visits.
4.	ICAR-Central Research Institute for Dryland Agriculture, Santoshnagar, Hyderabad	Training of faculty and M.Sc./M.Tech. students through short visits.
5.	ICAR Research Complex for NEH Region, Umroi Road, Umiam, Meghalaya	Training of faculty and M.Sc./M.Tech. students through short visits.
6.	ICAR Research Complex for Eastern Region, Patna, Bihar	Training of faculty and M.Sc./M.Tech. students through short visits.
7.	International Rice Research Institute (India Programme), Pusa Campus, New Delhi	Training of faculty and M.Sc./M.Tech. students through short visits.
8.	ICAR-Indian Institute of Maize Research, Pau Campus, Ludhiana, Punjab	Training of faculty and M.Sc./M.Tech. students through short visits.
9.	ICAR-Indian Institute of Farming Systems Research, Modipuram, Uttar Pradesh	Training of faculty and M.Sc./M.Tech. students through short visits.

IVRI, Izatnagar

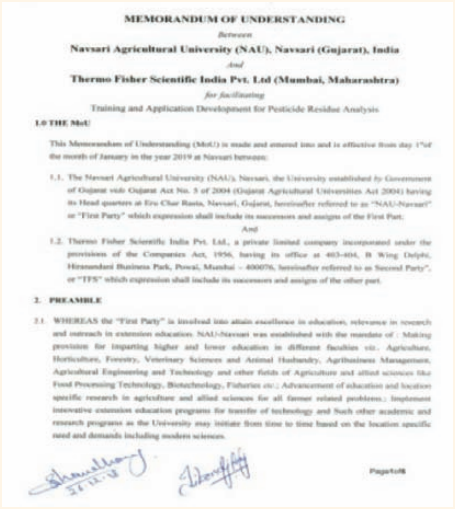
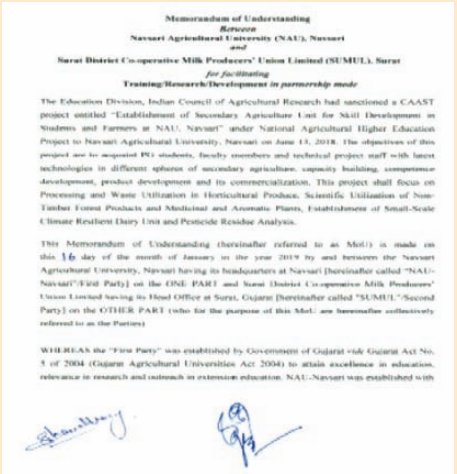
MOU signed with universities

S. No.	Institute	Purpose
1.	MJP Rohilkhand University, Bareilly	Capacity building of Faculties and students
2.	Sri Venkateswara Veterinary University, Tirupati (AP)	Capacity building of Faculties and students
3.	Nanaji Deshmukh Veterinary Science University	Capacity building of Faculties and students
4.	BanarasHinduUniversity	Capacity building of Faculties and students
5.	Guru AngadDev Veterinary and AnimalScienceUniversity, Ludhiana, Punjab	Capacity building of Faculties and students
6.	Karnataka Veterinary, Animal and FisheriesSciencesUniversity, Nandinagar, Bidar	Capacity building of Faculties and students
7.	Sher-e-KashmirUniversity of Agricultural Sciences and Technology, Jammu	Capacity building of Faculties and students
8.	Indian Institute of Technology, Roorkee	Capacity building of Faculties and students
9.	CCS NIAH, Bagpat	Capacity building of Faculties and students
10.	FAO through, NAHEP	Capacity building of Faculties and students

NAU, Navsari

MOUs signed with Industry and Other Organisation

MOUs were signed with four private partners regarding possibilities of Training, research and development under NAHEP-CAAST sub-project.

S. No.	Institute	Purpose	Activity
1.	Thermo Fischer Scientific, India	Training and development of Pesticide Analysis	 MEMORANDUM OF UNDERSTANDING Between Navsari Agricultural University (NAU), Navsari (Gujarat), India And Thermo Fisher Scientific India Pvt. Ltd (Mumbai, Maharashtra) for facilitating Training and Application Development for Pesticide Residue Analysis 1.0 THE MoU This Memorandum of Understanding (MoU) is made and entered into and is effective from day 1st of the month of January in the year 2019 at Navsari between: 1.1. The Navsari Agricultural University (NAU), Navsari, the University established by Government of Gujarat vide Gujarat Act No. 5 of 2004 (Gujarat Agricultural Universities Act 2004) having its Head quarters at Eru Char Rasta, Navsari, Gujarat, hereinafter referred to as "NAU-Navsari" or "First Party" which expression shall include its successors and assigns of the First Part; And 1.2. Thermo Fisher Scientific India Pvt. Ltd., a private limited company incorporated under the provisions of the Companies Act, 1956, having its office at 403-404, B Wing Delphi, Hiranandani Business Park, Powai, Mumbai – 400076, hereinafter referred to as Second Party"; or "TFS" which expression shall include its successors and assigns of the other part. 2. PREAMBLE 2.1. WHEREAS the "First Party" is involved into attain excellence in education, relevance in research and outreach in extension education. NAU-Navsari was established with the mandate of : Making provision for imparting higher and lower education in different faculties viz.: Agriculture, Horticulture, Forestry, Veterinary Sciences and Animal Husbandry, Agribusiness Management, Agricultural Engineering and Technology and other fields of Agriculture and allied sciences like Food Processing Technology, Biotechnology, Fisheries etc.; Advancement of education and location specific research in agriculture and allied sciences for all farmer related problems.; Implement innovative extension education programs for transfer of technology and Such other academic and research programs as the University may initiate from time to time based on the location specific need and demands including modern sciences.
2.	SUMUL Surat	Training, research and development	 Memorandum of Understanding Between Navsari Agricultural University (NAU), Navsari and Surat District Co-operative Milk Producers' Union Limited (SUMUL), Surat for facilitating Training/Research/Development in partnership mode The Education Division, Indian Council of Agricultural Research had sanctioned a CAAST project entitled "Establishment of Secondary Agriculture Unit for Skill Development in Students and Farmers at NAU, Navsari" under National Agricultural Higher Education Project to Navsari Agricultural University, Navsari on June 13, 2018. The objectives of this project are to acquaint PG students, faculty members and technical project staff with latest technologies in different spheres of secondary agriculture, capacity building, competence development, product development and its commercialization. This project shall focus on Processing and Waste Utilization in Horticultural Produce, Scientific Utilization of Non-Timber Forest Products and Medicinal and Aromatic Plants, Establishment of Small-Scale Climate Resilient Dairy Unit and Pesticide Residue Analysis. This Memorandum of Understanding (hereinafter referred to as MoU) is made on this 16 day of the month of January in the year 2019 by and between the Navsari Agricultural University, Navsari having its headquarters at Navsari [hereinafter called "NAU-Navsari"/First Party] on the ONE PART and Surat District Co-operative Milk Producers' Union Limited having its Head Office at Surat, Gujarat [hereinafter called "SUMUL"/Second Party] on the OTHER PART (who for the purpose of this MoU are hereinafter collectively referred to as the Parties) WHEREAS the "First Party" was established by Government of Gujarat vide Gujarat Act No. 5 of 2004 (Gujarat Agricultural Universities Act 2004) to attain excellence in education, relevance in research and outreach in extension education. NAU-Navsari was established with

S. No.	Institute	Purpose	Activity
3.	Paperdom Surat	Training, research and development	
4.	Unifeb India Solution, Nashik	Training, research and development	 MoU signing ceremony at NAU with Unifeb India, Nashik

F. STUDENT PG/ Ph.D. PROGRAMME

CIFE, Mumbai

S. No.	Name of Student	Research Area	Name of the Mentor	Country and lab	Duration and date	Photo
1.	Mr. Chittranjan Raul	Enriching elemental deficiency, carbon storage and enhancing productivity of the soil	Dr. Maria Teresa Borges	CIIMAR, University of Porto, Rua dos Bragas 289, 4050-123 Porto, Portugal	One month (October-November 2019)	
2.	Ms. Tejaswini	Biofloc technology for sustainable effluent management in Aquafarming	Dr. Salin Krishna	Asian Institute of Technology (AIT), Bangkok salinkr@ait.asia	One month (December 2019 to January 2020)	
3.	Mr. Pranab Dihngia	Biofloc technology for sustainable effluent management in Aquafarming	Dr. Salin Krishna	Asian Institute of Technology (AIT), Bangkok salinkr@ait.asia	One month (December 2019 to January 2020)	
4.	Mr. Prasanta Jana	Nutraceuticals for stress mitigation and growth enhancement in ISW	Dr. Genevieve Corraze	INRA, Nutrition Metabolism and Aquaculture (NuMeA) St-Pee, France	One month (January-February 2020)	

S. No.	Name of Student	Research Area	Name of the Mentor	Country and lab	Duration and date	Photo
5.	Mr. Mritunjoy Paul	Nutraceuticals for stress mitigation and growth enhancement in ISW	Dr. Stephanie Montagne	INRA, Nutrition Metabolism and Aquaculture (NuMeA) St-Pee, France	One month (January-February 2020)	
6.	Mr. Vijay Kumar Mannur	Nutraceuticals for stress mitigation and growth enhancement in ISW	Dr. P. Antony Jesu Prabhu	Institute of Marine Research, Bergen, Norway antony.prabhu@nifes.no	One month (October-November 2019)	
7.	Ms. Nisha Chaupal	Nutraceuticals for stress mitigation and growth enhancement in ISW	Dr. P. Antony Jesu Prabhu	Institute of Marine Research, Bergen, Norway antony.prabhu@nifes.no	One month (November-December 2019)	
8.	Mr. Manas Kumar Meiti	Nutraceuticals for stress mitigation and growth enhancement in ISW	Dr. Vikas Kumar	University of Idaho, Moscow, Idaho, USA	One month (December 2019 to January 2020)	

S. No.	Name of Student	Research Area	Name of the Mentor	Country and lab	Duration and date	Photo
9.	Mr. Chetan Kumar Garg	Nutraceuticals for stress mitigation and growth enhancement in ISW	Dr. Vikas Kumar	University of Idaho, Moscow, Idaho, USA	One month (February-March 2020)	
10.	Ms.Hougaina Panmei	Nutraceuticals for stress mitigation and growth enhancement in ISW	Dr. Brian Small,	University of Idaho, Hagerman, Idaho, USA bcsmall@uidaho.edu	One month (February-March 2020)	
11.	Ms. Garima	Sustainable fish and shellfish production systems through stocking, harvesting and bioremediation strategies	Dr. Maria Teresa Borges	CIIMAR, University of Porto, Rua dos Bragas 289, 4050-123 Porto, Portugal	One month (November-December 2019)	
12.	Mr. Manmohan Kumar	Sustainable fish and shellfish production systems through stocking, harvesting and bioremediation strategies	Dr. Salin Krishna	Asian Institute of Technology (AIT), Bangkok salinkr@ait.asia	One month (January-February 2020)	

S. No.	Name of Student	Research Area	Name of the Mentor	Country and lab	Duration and date	Photo
13.	Mr. Arul Murugan	Microbial composition of ISW and interaction with host and environment	Dr. Gulsen Ulukoy	Department of Aquaculture Division Fish Diseases Muğla, Turkey Telphone: +90 252 211 1000 Fax: +90- 252 223 9280 Webpage: http://www.mu.edu.tr/tr/personel/gulukoy	One month (February-March 2020)	
14.	Mr. Sambit Kishore Das	Microbial composition of ISW and interaction with host and environment	Dr. Manuel F. Varela	Biology Department, Eastern New Mexico University, Portales New Mexico, 88130, USA	One month (January-February 2020)	
15.	Ms. Monalisha Kumar	Microbial composition of ISW and interaction with host and environment	Rohinee N. Paranjpy	Northwest Fisheries Science Centre 2725 Montlake Blvd. East Seattle, WA 98112 , USA	One month (December 2019 to January 2020)	
16.	Mr. Angom Lenin Singh	Genetic evaluation of common carp in multi-stocks, multi-inland saline environments	Prof. Jorge Fernandes,	Faculty of Biosciences & Aquaculture, Nordland University, Bodo, Norway	One month (February-March 2020)	

S. No.	Name of Student	Research Area	Name of the Mentor	Country and lab	Duration and date	Photo
17.	Mr. Mohammed Akram Javith	Economically feasible technology for producing value-added fish products from fish grown in ISW	Dr.Soottawat Benjakul	Department of Food Technology, Faculty of Agro-Industry, Prince of Songkla University, Hat Yai, Songkhla 90112 Thailand	One month (December 2019 to January 2020)	
18.	Ms. V. Gomathy	Developing ICT based support system for Inland saline aquaculture	Dr. Saleem Sheikh	Agribusiness and Applied Economics, Director of Centre for Agricultural Policy and Trade Studies (CAPTS), North Dakota State University, USA.	One month (January-February 2020)	
19	Mr. Velumani. T	Developing ICT based support system for Inland saline aquaculture	Dr. Edward Allison	Marine and Environmental Affairs, College of Environment, University of Washington, 1492 NE Boat St., Seattle, WA, USA	One month (February-March 2020)	

IVRI, Izatnagar

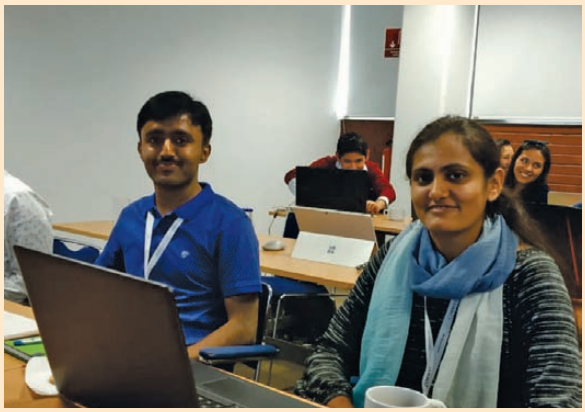
S. No.	Name of Student	Ph.D./M.Sc.	Research area	International training and host Institute	Duration of training	Photo
1.	Akansha Singh, P-2051	Ph.D	Genome wide association (GWAS)	Michigan State University, USA	3 months	
2.	Richa Arora, P-2078	Ph.D	Bioinformatics, big-data analyses, new-generaton sequencing and sequence data analysis	Michigan State University, USA	3 months	
3.	Waseem Akram Malla, P-2031	Ph.D	Bioinformatics, big-data analyses, new-generaton sequencing and sequence data analysis	Michigan State University, USA	3 months	
4.	Anil Gattani, P-2021	Ph.D	Host-pathogen interaction	University of Missouri, Columbia, USA	3 months	

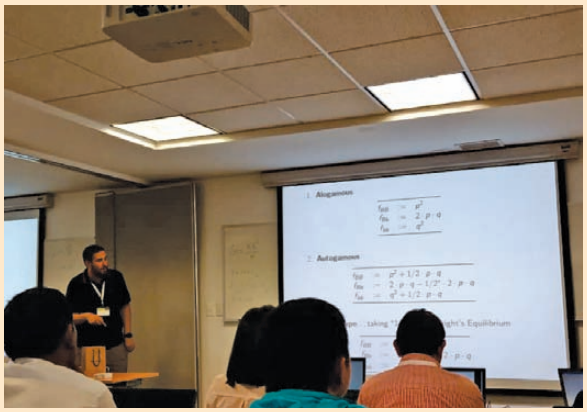
S. No.	Name of Student	Ph.D./M.Sc.	Research area	International training and host Institute	Duration of training	Photo
5.	Mageswary. R, P-1869	Ph.D	Genetically engineered vaccine/reverse genetics	University of Maryland, USA	2 months	
6.	Arnav Mehrotra, P-2116	Ph.D	Bioinformatics, big-data analyses, new-generaton sequencing and sequence data analysis	ETH, Zurich, Switzerland	3 months	
7.	Ranjitha H.B., P-2082	Ph.D	Genetically engineered vaccine/reverse genetics	CSIC, Madrid, Spain	3 months	
8.	Dharanesha N.K, P-2091	Ph.D	Advanced diagnostics	Vetmed Uni Vienna, Switerzerland	3 months	

S. No.	Name of Student	Ph.D./M.Sc.	Research area	International training and host Institute	Duration of training	Photo
9.	MahvashHira Khan, M-5869	MVSc	Advanced diagnostics	Kyushu University, Fukuoka, Japan	2 months	

UAS, Bangalore

S. No.	Name of Student	Ph.D./M.Sc.	Research area	International training undertaken with duration	Host institute	Photo
1.	Ms. N. C. Sunitha	Ph.D. in Genetics & Plant Breeding	Discovery and validation of late wilt disease resistance conferring QTL and their effect on grain yield and its components in maize (Zea mays L.)	International Training on "Statistical analysis of genetic and phenotypic data for breeders" during 15 – 26 July, 2019.	CIMMYT, Mexico	





S. No.	Name of Student	Ph.D./M.Sc.	Research area	International training undertaken with duration	Host institute	Photo
2.	Mr. Santosh Nagappa Ningoji	Ph. D in Agronomy	Reduced runoff farming practices for soil moisture distress in Eastern Dry Zone of Karnataka	Galilee International Management Institute	Nahalal, Israel	

CSAUA&T, Kanpur

S. No.	Name of Student	Ph.D./ M.Sc.	Area of Research	International training & Host institute	Duration	Photo
1.	Hanuman Prasad Pandey	Ph.D.	Study the different Pools of Various nutrients	The Hebrew University of Jerusalem, Israel	One Month	
2.	Ashok Kumar	Ph.D	Study About different Pools of Various nutrients	The Hebrew university of Jerusalem, Israel	One Month	

S. No.	Name of Student	Ph.D./ M.Sc.	Area of Research	International training & Host institute	Duration	Photo
3.	Nitesh S.D.	Ph.D	Speed breeding in chickpea using tissue culture	University of Queensland, Brisbane, Australia	One Month	
4.	Nageshwar	Ph.D	DArTseq and sequencing technology	CIMMYT, Mexico	One Month	
5.	Ram Naresh	Ph.D.	Study on bio-fertilizer	Wageningen University & Research, Netherland	One Month	
6.	Harshita	Ph.D	The Augmenting of plant disease resistance using CRISPR-Cas9 Technology	Wageningen University & Research, Netherland	One Month	

S. No.	Name of Student	Ph.D./ M.Sc.	Area of Research	International training & Host institute	Duration	Photo
7.	Vipul Pratap Singh	Ph.D.	Vegetable breading for the Tropics	World Vegetable centre, Taiwan	One Month	
8.	Harshita Sharma	Ph.D	Seaweed extract as a bio-stimulant for legume crop	Wageningen University & Research, Netherland	One Month	

BCKV, Mohanpur

S. No.	Name of Student	Ph.D./ M.Sc.	Research area	International training	Host institute	Duration	Photo
1.	Biswabara Sahu	Ph.D.	Carbon budgeting in soil under conservation agriculture	Sandwich Ph.D. programme	Murdoch University, Australia	3 months	

S. No.	Name of Student	Ph.D./ M.Sc.	Research area	International training	Host institute	Duration	Photo
2.	Jaison. M	Ph.D.	Phosphorus availability in soils and its nutrition in crops affected by conservation agriculture	Sandwich Ph.D. programme	University of Florida, USA	3 months	
3.	Ahana Dey	Ph.D.	Dynamics of Zn availability in soil and its nutrition of crops grown under conservation agricultural technology	Sandwich Ph.D. programme	Murdoch University, Australia	3 months	
4.	Siddhartha Mukherjee	Ph.D.	Nitrogen nutrition of crops under conservation agriculture	Sandwich Ph.D. programme	UC Davis, Cornell, USA	3 months	
5.	Puja Singh	Ph.D.	Abundance and function of keystone microbes under conservation agriculture	Sandwich Ph.D. programme	UC Davis, Cornell, USA	3 months	

S. No.	Name of Student	Ph.D./ M.Sc.	Research area	International training	Host institute	Duration	Photo
6.	Tanmoy Paik	Ph.D.	Effect of different tillage practices and nutrient management along with rice straw residues on growth , productivity, economics and energetics of component crops under rice – rapeseed mustard – black gram cropping sequence	Sandwich Ph.D. programme		3 months	
7.	Sahely Kanthal	Ph.D.	Performance of rice-wheat-green gram and rice-lentil-fallow cropping systems under conservation agriculture practices	Sandwich Ph.D. programme	University of Wisconsin, USA	3 months	
8.	Soumen Mondal	Ph.D.	Simulating the impact of conservation agriculture on performance of maize-cowpea-rice cropping system using DSSAT 4.7 model.	Sandwich Ph.D. programme	University of Milan, Italy	3 months	
9.	Aniket-Baishya	Ph.D.	Soil and water Engineering	Sandwich Ph.D. programme	Wageningen University, Netherland	3 months	

S. No.	Name of Student	Ph.D./ M.Sc.	Research area	International training	Host institute	Duration	Photo
10.	Kingshuk Roy	Ph.D.	Soil physical properties, energy audit, carbon footprint, decision support system	Sandwich Ph.D. programme		3 months	
11.	Amrita Dasgupta	Ph.D.	Soil temperature, moisture, weather variables and soil microbial communities in relation to plant diseases under different degrees of conservation agriculture in rice-wheat-pulses and rice-mustard-pulses based cropping system.	Sandwich Ph.D. programme	Texas A&M University, USA	3 months	
12.	Bhanothu Shiva	Ph.D.	Diseases and pathogen dynamics in rice-maize-cowpea and rice-potato-pumpkin based cropping system under different degrees of conservation agriculture	Sandwich Ph.D. programme	Texas A&M University, USA	3 months	
13.	Shamik Dey	Ph.D.	Assessing biodiversity of arthropods emphasizing taxonomy of oribatid mites (Acari: Mesostigmata) inhabiting in soils under conservation agriculture practices.	Sandwich Ph.D. programme	Massey University, New Zealand	3 months	

S. No.	Name of Student	Ph.D./ M.Sc.	Research area	International training	Host institute	Duration	Photo
14.	Debarpita Datta Ray	Ph.D (Genetics and Plant Breeding)	Identification and genetic analysis of rice genotypes responsive to conservation agriculture	Sandwich Ph.D. programme	University of Kentucky, USA	3 months	
15.	P. Pravalika Reddy	Ph.D.	Impact of conservation agricultural practices on arecanut- and onion- based cropping systems	Sandwich Ph.D. programme	University of Florida, USA	3 months	
16.	Anwesha Mandal	Ph.D.	Social Ecology of Conservation Agriculture in terms of Water-Nutrient-Carbon Management: The analysis and interpretation.	Sandwich Ph.D. programme	University of Natural Resources and Life Sciences, Vienna, Austria	43 months	
17.	Tufleuddin Biswas	Ph.D (Agricultural Statistics)	Application of Multiple Criteria Decision Making (MCDM) Approach for Assessment of Conservation Agriculture Practices with Rice Based Cropping Systems	Sandwich Ph.D. programme	Kansas State University, USA	3 months	

S. No.	Name of Student	Ph.D./ M.Sc.	Research area	International training	Host institute	Duration	Photo
18.	Riti Chatterjee	Ph.D (Agricultural Extension)	The estimation of ecological services in terms of energy, climate and knowledge management: The dynamics of social-ecology of Conservation Agriculture at farmers' level.	Sandwich Ph.D. programme	The Ohio State University, USA	3 months	

NAU, Navsari

S. No.	Name of student	Ph.D. /M.Sc.	Research Area	International training area	Duration	Host Institute	Photo
1.	Naik Pooja R.	Ph. D (Horticulture) Post Harvest Technology	Post Harvest technology and Waste Utilization	International training on "Processing and Value addition of Horticultural Crops particularly preparation of functional foods " .	3 months (October to December, 2019)	The Hebrew University of Jerusalem, Israel	
2.	Jena Suchismita	Ph. D (Horticulture) Fruit Science	Post Harvest technology and Waste Utilization	International training on " Preparation of Designer foods and Nutraceuticals from Horticultural Crops by processing and waste utilization "	November, 2019 to January, 2020 for 3 months	UC Davis University of California	
3.	Sushmitha M. B.	M.Sc. (Horticulture) Post Harvest Technology	Post Harvest technology and Waste Utilization	International training on "Preparation of Designer foods and Nutraceuticals from Horticultural Crops by processing and waste utilization"	November, 2019 to January, 2020 for 3 months	UC Davis University of California	

S. No.	Name of student	Ph.D. /M.Sc.	Research Area	International training area	Duration	Host Institute	Photo
4.	Chaudhari Ritaben Ranjitbhai	M. Sc. (Horticulture) Vegetable Science	Post Harvest technology and Waste Utilization	International training on "Processing and Value addition of Horticultural Crops particularly preparation of functional foods"	October to December, 2019 for 3 months	The Hebrew University of Jerusalem, Israel	
5.	Savaliya Pallavkumar Jayendrabhai	M.Sc. (Horticulture) Vegetable Science	Post Harvest technology and Waste Utilization	International training on "Preparation of Designer foods and Nutraceuticals from Horticultural Crops by processing and waste utilization "	November, 2019 to January, 2020 for 3 months	UC Davis University of California	
6.	Pancholi Hayusha	M.Sc. (Horticulture) (Vegetable Science)	Post Harvest technology and Waste Utilization	International training on "Preparation of Designer foods and Nutraceuticals from Horticultural Crops by processing and waste utilization "	November, 2019 to January, 2020 for 3 months	UC Davis University of California	
7.	Bambhaniya Kinjal	M. Sc. (Horti.) Vegetable Science	Post Harvest technology and Waste Utilization	International training on "Processing and Value addition of Horticultural Crops particularly preparation of functional foods "	October to December, 2019 for 3 months	The Hebrew University of Jerusalem, Israel	

S. No.	Name of student	Ph.D. /M.Sc.	Research Area	International training area	Duration	Host Institute	Photo
8.	Patel Payal Kumari C.	M. Sc. (Forestry)	Utilization of Non-timber Forest Produces	International training on "Tree domestication and value addition of minor fruits"	December, 2019 to January, 2020 for 2 months	Bioversity International, CGIAR system management office, Rome, Italy, France	
9.	Rathod Kayur Kumar R.	M. Sc. (Forestry)	Waste utilization and value addition of wood	International training on "Waste utilization of wood/non wood and its value addition"	January - February, 2020 for 2 months	Corvallis, USA, Oregon (OR)	
10.	Dr. Prerna P Ghorpade	Ph. D (Veterinary) Livestock Production and Management	Animal behaviour, Computer applications for animal management	International training on " Artificial neutral network for predicting body weights using image analysis in dairy animals"	February to April, 2020 for 3 months	Louisiana state University, USA	
11.	Londhe Arvind	M.V.Sc. (Animal Nutrition)	Animal behaviour, Computer applications for animal management	International training on "Artificial neutral network for predicting body weights using image analysis in dairy animals"	February to April, 2020 for 3 months	Louisiana state University, USA	

S. No.	Name of student	Ph.D. /M.Sc.	Research Area	International training area	Duration	Host Institute	Photo
12.	Dhara Lunagariya	Ph. D (Agri.) Soil Sci. & Agril. Chem.	Dissipation and persistence of herbicides in vegetable crops	International training on "Advances in Pesticide residues"	November-December, 2019 for 1 month	Ghent University, Belgium	
13.	Pawan Kumar	M. Sc. (Agri.) Soil Sci. & Agril. Chem.	Status of pesticide residue in vegetables	International training on "Advances in Pesticide residues"	November-December, 2019 for 1 month	Ghent University, Belgium	
14.	Inamdar Arpita Girishkumar	M. Sc. (Agri.) Agricultural Entomology	Dissipation and persistence of new pesticide/ insecticide in vegetable crops	International training on "Advances in Pesticide residues"	November-December, 2019 for 1 month	Ghent University, Belgium	

MPKV, Rahuri

S. No.	Name	Present degree	Discipline	Research area	International training Area	Duration	Host institute	Photo
1.	Er. Sachin Pandurang Shinde	Ph. D.	SWCE	Water Resources planning for watershed using Geospatial Techniques	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	

S. No.	Name	Present degree	Discipline	Research area	International training Area	Duration	Host institute	Photo
2.	Er. Nimbalkar Dattatray Vikram	Ph. D.	FMPE	Development and optimization of Singulation mechanism for Onion transplanter	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	
3.	Er. Magar Ajit Prahlad	Ph. D.	FMPE	Development of automatic precision planting mechanism for vegetable seedlings in portray	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	
4.	Mr. Ghodke Pankaj Bhaskarrao	M. Sc.	Agronomy	Effect of foliar application of organic formulations on growth and yield of Okra	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	
5.	Mr. Ghadage Prashant Ankush	Ph. D.	Agricultural Extension	Impact of National Innovations on Climate Resilient Agriculture (NICRA) project on its beneficiaries in western Maharashtra	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	

S. No.	Name	Present degree	Discipline	Research area	International training Area	Duration	Host institute	Photo
6.	Mr. Rushikesh Bapuso Kalamkar	Ph. D.	Agricultural Extension	Perception and adaptation strategies of Pomegranate growers towards climate change and variability in Maharashtra	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	
7.	Mr. Mininath Sonyabapu Anarase	Ph. D.	Agricultural Extension	Perception of grape growers towards climate variability in Maharashtra	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	
8.	Mr. Gaurav Prakash Bari	M. Sc.	Agricultural Extension	Perception of farmers about climate change and its effects on Dryland agriculture	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	
9.	Ms. Komal Ramesh Gadekar	M. Tech	IDE	Deficit Irrigation for Wheat production under semi-arid condition	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	

S. No.	Name	Present degree	Discipline	Research area	International training Area	Duration	Host institute	Photo
10.	Er. Sandesh Ashok Kharat	M. Tech	SWCE	Simulation of event based rainfall-runoff process by using HEC-HMS	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	
11.	Ms. Khandekar Vidya Uttam	M. Tech	SWCE	Development of geomorphological Instantaneous Unit Hydrograph (GIUH) for watershed using RS and GIS	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	
12.	Mr. More Dnyaneshwar Devendra	M. Tech	SWCE	Assessment of ground water potential zones using RS & GIS for upper Panzra river for watershed planning	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	
13.	Ms. Ubale Sonali Prabhakar	M. Sc.	Genetics & Plant Breeding	Evaluation and identification of Wheat genotype for thermotolerance	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	

S. No.	Name	Present degree	Discipline	Research area	International training Area	Duration	Host institute	Photo
14.	Er. Jagdale Shubham Ravindra	M. Tech	IDE	Response of watermelon to different irrigation and fertigation levels under low plastic tunnel in winter season	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	
15.	Ms. Navnage Neha Prakash	Ph. D.	SSAC	Amelioration of heavy metal toxicity by using amendments and its effect on soil quality in an Inceptisols	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	
16.	Mr. Pradip Vasant Ambre	M. Tech	IDE	To study response of watermelon to spectral modification and irrigation level under shading nets	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	
17.	Mr. Shubham Anil Gade	M. Tech	IDE	Crop water requirement in context of climate variability	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	

S. No.	Name	Present degree	Discipline	Research area	International training Area	Duration	Host institute	Photo
18.	Ms. Godase Mayuri Manikrao	Ph. D.	Agronomy	Standardization of organic sources and formulations in soybean-onion cropping sequence	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	
19.	Ms. Ashvini Pramod Janjal	Ph. D.	Genetics & Plant Breeding	Genetic studies for drought tolenrence in Chickpea (Cicer arietinum L.)	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	
20.	Ms. Raut Amruta Dnyaneshwar	Ph. D.	SSAC	Nutrient requirement of maize by conjoint use of organic, inorganic and Gypsum based on yield targeted approach on sodic soil	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	
21.	Mr. Nikam Dheeraj Ravindranath	Ph. D.	IWM	Economics, adoption determinants and impact of micro irrigation technologies on cotton cultivation in North Maharashtra	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	

S. No.	Name	Present degree	Discipline	Research area	International training Area	Duration	Host institute	Photo
22.	Mr. Avinash Yashwant Rananavare	PhD.	SSAC	Soil and Water Quality Management Strategies Under Special Reference to GIS and Remote Sensing in Minor of Mula Canal Command Area	Dr. Manzul Kumar Hazarika, Director, Geoinformatics Centre	1 Month	AIT, Bangkok, Thailand	

IARI, New Delhi

S. No.	Name of Student	Ph.D./M.Sc.	Research area	International training area and duration	Host institute	Photo
1.	Ms. Arfa Anjum	Ph.D. Bioinformatics	Study on Genomic Sequence Segmentation using Statistical and Computational Approach	"Statistical Genomics" Duration: 3 months (1April – 30 June 2019)	Washington State University, Pullman, USA	
2.	Mr. Sridhar Ramachandra	Ph.D. Fruit and Horticultural Technology	Thesis Title: QTL mapping for Fruit Quality Trait(s) in Mango (Mangiferaindica L.)	Area: Genome-wide association study Duration: 3 months (Oct-Dec 2019)	University of Wisconsin, Madison, USA	
3.	Mr. Vinay N.D	Ph.D. Vegetable Science	Association Mapping for yield related traits in bitter gourd (Momordicacharantia L.) and comparative genome analysis with Momordicabalsamina	QTL-seq analysis Duration: 3 months (Oct-Dec 2019)	Shinshu University, Japan	

S. No.	Name of Student	Ph.D./M.Sc.	Research area	International training area and duration	Host institute	Photo
4.	Mr. Elangovan A	Ph.D. Plant Physiology	Phenomics and Molecular Analysis of Water Use Efficiency (WUE) and drought tolerance in Rice	Candidate gene analysis of WUE QTLs Duration: 3 months (Nov 2018 – Jan 2018)	University of Nebraska, Lincoln, USA	
5.	Mr. Biswabiplab Singh	Ph.D. Plant Physiology	Phenomics and Molecular Analysis of Nitrogen Use Efficiency (NUE) in Wheat	High throughput image data analytics Duration: 3 months (Sep-Nov 2018)	University of Nebraska, Lincoln, USA	
6.	Ms. Dhivya Priya Thenappan	Ph.D. Microbiology	Genome based analysis of rice-actinobacterial interactions	WGS data analysis to decipher biosynthetic gene clusters (BGCs) in Actinobacteria Duration: 3 months (Jan-March 2020)	Graz University of Technology, Petersgasse 12, A-8010 Graz, AUSTRIA	
7.	Ms. Shweta Meshram	Ph.D. Plant Pathology	Mechanism of Resistance in Maize Inbred Lines against Maydis Leaf Bight disease	Homologous recombination technique to validate pathogenicity genes in fungi Duration: 2 months (Nov-Dec 2019)	Iowa State University, USA	

S. No.	Name of Student	Ph.D./M.Sc.	Research area	International training area and duration	Host institute	Photo
8.	Mr. Ramesh K.B	Ph.D. Entomology	Dynamics of endosymbiont interaction in Bemisiatabaci (Gennadius)	Molecular Techniques to study Host-endosymbiont interactions Duration: 2 months (Nov-Dec 2019)	ARO, the Volcanic Centre, Israel	
9.	Ms. Ramya N	Ph.D. Entomology	Biosystematic studies of family Delphacidae (Hemiptera: Fulgoroidea) from India	Development of species specific marker for key Delphacid pests Duration: 2 months (September – August 2019)	University of Delaware, USA	
10.	Ms. Sharani Choudhary	Ph.D. Molecular Biology and Biotechnology	Identification of Genes and Pathways introgressed from wild species Diplotaxiserucoides in Brassica juncea for developing Alternaria resistance	Pathogen Genomics Duration: 3 months	King Abdullah University of science and Technology, Jeddah, Saudi Arabia.	
11.	Ms. Chaitra Ganapati Bhat	Ph.D. Nematology	A molecular investigation of Heterorhabditis nematode factors involved in symbiosis with Photorhabdus bacteria	Functional validation of nematode genes using RNAi/CRISPR-Cas tools Duration: 3 months (January-March 2020)	University of California, Riverside, USA	

S. No.	Name of Student	Ph.D./M.Sc.	Research area	International training area and duration	Host institute	Photo
12.	Ms. Megha R	M.Sc. Fruit Science	Biochemical Profiling and SSR polymorphism studies on mango germplasm	Yet to decide	Yet to decide	
13.	Mr. Alok Kumar Sahoo	Ph.D. Agricultural Extension	Stakeholders risk benefit perception and acceptance behaviour for GM crops in India	Yet to decide	Yet to decide	

PAU, Ludhiana

S. No.	Name of Student	Ph.D./M.Sc.	Research area	Host institute for international training	Duration	Photo
1.	MANJEET KAUR	Ph.D. (Soil Science)	Estimation and mitigation of greenhouse gas (GHG) emissions in agriculture.	Carbon Management and Sequestration Centre (CMASC), Ohio State University, Columbus, USA	January-February, 2020 for 2 months	
2.	JYOLSNA T	Ph.D. (Soil Science)	Water and Nitrogen Management in major cropping systems using Geo- spatial Technologies	Dept. Soil, Water & Climate, University of Minnesota, St. Paul 55108, Minnesota, USA	February-March, 2020 for 2 months	

S. No.	Name of Student	Ph.D./M.Sc.	Research area	Host institute for international training	Duration	Photo
3.	RAAGJEET KAUR	Ph.D. (Soil Science)	Organic matter dynamics, C accretion, biochar, nutrient cycling	Department of Soil and Crop Sciences, Colorado State University, Fort Collins, USA	May 15-August 15, 2020 for 3 months	
4.	GARGI SHARMA	Ph.D. (Soil Science)	Residue management, salt-affected soils, C sequestration	Department of Plant and Soil Science, California State University, Fresno, CA	May 15-August 15, 2020 for 3 months	
5.	RAMANPREETKAUR	Ph.D. (Agronomy)	Understanding differential efficacy of herbicides for weed control at varying growth temperatures	Kansas State University, Manhattan, USA	December, 2019-January, 2020 for 2 Months	
6.	TARANDEEP KAUR	Ph.D. (Agronomy)	Fertigation and water management in cotton-wheat	University of Nebraska, Lincoln/ Clemson University, South Carolina/ Any other	20 December, 2019- 20 January, 2020 for 1 Month	

S. No.	Name of Student	Ph.D./M.Sc.	Research area	Host institute for international training	Duration	Photo
7.	AMINA RAHEJA	Ph.D. (SWE)	Development of soil moisture and temperature sensors	University of Florida	December, 2019-January, 2020 for 2 months	
8.	SUSANTA DAS	Ph.D. (SWE)	Development of soil moisture and temperature sensors	Kansas State University	December, 2019-January, 2020 for 2 months	
9.	GURJEET SINGH	Ph.D. (Plant Breeding)	Mapping of QTLs for yield related traits in rice using indica X tropicaljaponica derived RIL population	Department of Soil and Crop Sciences College of Agriculture and Life Sciences Texas A&M University Texas	July-August, 2019 for 2 months	
10.	SHIV KUMAR LOHAN	Ph.D. (FMPE)	Development of Autonomous paddy transplanter	Dept. of Biological Systems Engineering Center for Precision and Automated Agricultural Systems, Washington State University 24106 N Bunn Rd, Prosser, WA 9935	November-December, 2019 for 2 months	
11.	JAIDEEP	Ph.D. (FMPE)	Development of Autonomous paddy transplanter	Indian Association of Japan, Tokyo, Professor in Management, Hosei University,Tokyo	November-December, 2019 for 2 months	

G. MONITORING BY PIU, NAHEP

CIFE, Mumbai

Review Meeting by Dr. P. K. Ghosh, National Coordinator, NAHEP at ICAR-CIFE, Mumbai (June 2018)

National Coordinator monitoring research activity carried out by students

Institute-industry interface meeting in presence of National Coordinator. (13th November 2018)

NAU, Navsari

Visit of National coordinators to Pesicide Residue Analaysis Unit; NAU's NABL Accredited Food Quality Testing Laboratory on 11 July 2019

National Co-ordinators interacting with CAAST-NAU Students and Associated Staff

National Coordinators visiting to Unit Center of Excellence on Post Harvest Technology

National Coordinators interacting with CAAST Students and Associated Staff

Visit of National Coordinators to different Labs

Visit of National Coordinators to Waste Utilization Unit of NAHEP-CAAST Sub-project at NAU, Navsari

Demonstration of Banana Fiber Extratction Unit to National Coordinators at Pseudostem Processing Plant

Visit by NC (CAAST) NC (M & E) to Unit : Scientific Utilization of Non-Timber Forest Products and Medicinal Aromatic Plants

National Coordinators reviewing the progress made in CAAST project in the presence of Hon'ble Vice Chancellor and DR, NAU, Navsari

Students and SRFs selected in CAAST-Subproject with National Coordinator

CSAU&T, Kanpur

National Coordinator (CAAST) reviewing & monitoring Progres at CSAUA&T Kanpur on December 4, 2018

National Coordinator (M&E) monitoring the project at CSAUA&T Kanpur on May 17, 2019

National Coordinator (CAAST) with CAAST faculty at CSAUA&T Kanpur

National Coordinator (M&E) visiting polyhouse at CSAUA&T Kanpur on May 17, 2019

National Coordinator (M&E) visiting students research at CSAUA&T Kanpur on May 17, 2019

National Coordinator, (M&E) visiting food progress unit and student explaning their food product

IVRI, Izatnagar

Review meeting by National Coordinator and other officials of PIU-NAHEP at ICAR-IVRI on 16 March, 2019

Visit by National Coordinator and other officials of PIU-NAHEP at ICAR-IVRI on 16 March, 2019

UAS, Bangalore

Interaction meeting with associated scientists at UAS, Bangalore on 24th April, 2019

Poster presented by M.Sc. and Ph.D. students at UAS, Bangalore

MPKV, Rahuri

Interaction with National coordinators, Dr. Gajendra Singh, PI and associated scientist under CAAST on 25th July, 2019

Demonstration of automation pump switch board based on sensor

Participants in International symposium on "Strategizing Education and Innovations in Robotics, Drones and IoTs for Climate Smart Agriculture" during 23-25 July, 2019

BCKV, Mohanpur

National coordinators interacting with faculties and students in field under CAAST on "Conservation Agriculture" in Bidhan Chandra Krishi Viswavidyalaya, West Bengal June, 2018

Review meeting of BCKV centre with National Coordinator 22 June, 2018

Interaction of two National Coordinators Dr. P.K. Ghosh and Prabhat Kumar with students, faculties and farmers associated with the CAAST on conservation agriculture 22 March, 2019

Review of farmers related activities at BCKV Centre by the National Coordinator (CAAST) 08 July, 2019

H. CONTRIBUTORS

S. No.	Name of PI	Name of University	Photo
1.	Dr. Gopal Krishna Mob.- 09869085260 gopalkrishna@cife.edu.in	CIFE, Mumbai	
2.	Dr. Rajendra Prasad Mob. 09452883308 deanagben@uasbangalore.edu.in	UAS, Bangalore	
3.	Dr. Biswapati Mandal Mob.- 09836381615 mandalbiswapati@rediffmail.com	BCKV, West Bengal	
4.	Dr. H.G. Prakash M 9412156124 directoraes@csauk.ac.in drhp_k@yahoo.co.in	CSAU&T, Kanpur	

S. No.	Name of PI	Name of University	Photo
5.	Dr. Sunil D. Gorantiwar Mobile: 9881595081 gorantiwars@gmail.com	MPKV, Rahuri	
6.	Dr. A. K. Tiwari Mob.- 09412510980 aktiwari63@yahoo.com	IVRI, Izatnagar	
7.	Dr. T. Ahlawat Mob.- 09879124272 tahlawat4@gmail.com	NAU, Navsari	
8.	Dr. Viswanathan Mob.- 09013885245 Viswanathan@iari.res.in	IARI, New Delhi	
9.	Dr. O.P. Choudhari Mob. 8196080649 opchoudhary@pau.edu	PAU, Ludhiana	

NATIONAL AGRICULTURAL HIGHER EDUCATION PROJECT
INDIAN COUNCIL OF AGRICULTURAL RESEARCH
Krishi Anusandhan Bhawan II, Pusa Campus, New Delhi (India)
https://nahep.icar.gov.in