Annual Report 2020-21

National Agricultural Higher Education Project (NAHEP)

ICAR

NAHEP

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Indian Council of Agricultural Research and World Bank Project

Annual Report 2020-21

Project Implementation Unit – NAHEP
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Abbreviations

S.N.	Abbreviation	Full Form
1	AAU, A	Anand Agricultural University, Anand
2	AAU, J	Assam Agriculture University, Jorhat
3	AED	Agricultural Education Division
4	AGV	Automated Guided Vehicle
5	AHEPC	Agricultural Higher Education Programme Committee
6	AI	Artificial Intelligence
7	AICE	All India Competitive Examination
8	AICTE	All India Council for Technical Education
9	AIEEA	All India Entrance Examination for Admission
10	AMS	Academic Management System
11	ANDUAT	Acharya Narendra Deva University of Agriculture and Technology
12	ANGRAU	Acharya N.G. Ranga Agricultural University
13	APPA	Agricultural Pest Prediction and Advisory
14	AR	Augmented Reality
15	ARS	Agricultural Research Service
16	ASTRA	Association for Startups and Technology Refinement in Agriculture
17	ATARI	Agricultural Technology Application Research Institute
18	AU	Agricultural University
19	AUIPS	Agricultural University Implementation Performance Scoreboard
20	AWS	Automatic Weather Station
21	BASU	Bihar Animal Sciences University
22	BAU	Birsa Agricultural University
23	BCKV	Bidhan Chandra Krishi Vishwavidyalaya
24	BITS	Birla Institute of Technology and Science
25	CA	Conservation Agriculture
26	CAAST	Centre for Advanced Agricultural Sciences and Technology
27	CAD	Computer-aided design
28	CAU	Central Agricultural University
29	CCSHAU	Chaudhary Charan Singh Haryana Agricultural University
30	CDC	Career Development Centre
31	CEO	Chief Executive Officer
32	CFCB	Coconut Fibre enhanced Cement Board
33	CGIAR	Consultative Group on International Agricultural Research
34	CGKV	Chhattisgarh Kamdhenu Vishwavidyalaya
35	CGPA	Cumulative Grade Point Average
36	CIFE	Central Institute of Fisheries Education
37	CIL	Central Instrumental Laboratory
38	CMD	Chief Managing Director
39	CPI	Co-Principal Investigator
40	CPV	Canine Parvo virus
41	CQS	Consultants' Qualification Selection
42	CRS	Coconut Research Station

S.N.	Abbreviation	Full Form
43	CSAUT	Chandra Shekhar Azad University of Agriculture & Technology
44	CSAWM	Climate Smart Agriculture and Water Management
45	CSIR	Council of Scientific and Industrial Research
46	CSKHPKV	Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishwavidyalaya
47	DARE	Department of Agricultural Research and Education
48	DC	Data Centre
49	DDG	Deputy Director General
50	DG	Director General
51	DUVASU	Pt. Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go-Anusandhan Sansthan
52	DYSPUH&F	Dr. Yashwant Singh Parmar University of Horticulture & Forestry
53	EAP	Equity Action Plan
54	EFC	Expenditure Finance Committee
55	EMF	Environment Management Framework
56	ES	Environmental Sustainability
57	ESP	Environmental Sustainability Plan
58	ETP	Effluent Treatment Plant
59	F&AO	Finance and Account Officer
60	FBS	Fixed Budget Selection
61	FM	Financial Management
62	FMS	Financial Management System
63	FPO	Farmer Producer Organisation
64	FY	Financial Year
65	GADVASU	Guru Angad Dev Veterinary and Animal Sciences University
66	GBPUAT	G.B. Pant University of Agriculture and Technology
67	GIS	Geographic Information System
68	GRM	Grievance Redressal Mechanism
69	HAU	Haryana Agriculture University
70	HEI	Higher Education Institute
71	HP	Horsepower
72	HRM	Human Resource Management
73	IA	Impact Assessment
74	IABM	Institute of Agri Business Management
75	IARI	Indian Agricultural Research Institute
76	IASRI	Indian Agricultural Statistics Research Institute
77	ICAR	Indian Council of Agricultural Research
78	ICB	International Competitive Bidding
79	ICT	Information Communication and Technology
80	IDP	Institutional Development Plan
81	IFS	Integrated Farming System
82	IG	Innovation Grants
83	IGKV	Indira Gandhi Agricultural University
84	IIIC	Industry Institution Interaction Cell
85	IIT	Indian Institute of Technology

S.N.	Abbreviation	Full Form
86	ILMS	Integrated Library Management Software
87	IPR	Intellectual Property Rights
88	IR	Intermediate Results
89	IRRI	International Rice Research Institute
90	IT	Information Technology
91	ITK	Indigenous Traditional Knowledge
92	IVRI	Indian Veterinary Research Institute
93	JAU	Junagadh Agricultural University
94	JNKVV	Jawaharlal Nehru Krishi Vishwavidyalaya
95	JRF	Junior Research Fellow
96	KAB	Krishi Anusandhan Bhawan
97	KAU	Kerala Agricultural University
98	KMF	Knowledge Management Framework
99	KMP	Knowledge Management Portal
100	KVASU	Kerala Veterinary and Animal Sciences University
101	KVC	Krishi Vishwavidyalaya Chhatr
102	KVK	Krishi Vigyan Kendra
103	LAC	Learning and Assessment Centre
104	LCC	Leaf Color Chart
105	LCS	Least Cost Selection
106	LIB	Limited International Bidding
107	MAFSU	Maharashtra Animal & Fishery Sciences University
108	MAHYCO	Maharashtra Hybrid Seeds Co.
109	MD	Managing Director
110	MHU	Maharana Pratap Horticultural University
111	MIS	Management Information System
112	MOOC	Massive Open Online Courses
113	MPKV	Mahatma Phule Krishi Vidyapeeth
114	MPUAT	Maharana Pratap University of Agriculture and Technology
115	MTR	Mid-Term Review
116	NAAC	National Assessment and Accreditation Council
117	NAARM	National Academy of Agricultural Research Management
118	NABARD	National Bank for Agriculture and Rural Development
119	NABL	National Accreditation Board for Testing and Calibration Laboratories
120	NAHEP	National Agricultural Higher Education Project
121	NARES	National Agricultural Research & Education System
122	NAU	Navsari Agricultural University
123	NBPGR	National Bureau of Plant Genetic Resources
124	NC	National Coordinator
125	NCB	National Competitive Bidding
126	NCDC	National Cooperative Development Corporation
127	ND	National Director
128	NDRI	National Dairy Research Institute
129	NDVSU	Nanaji Deshmukh Veterinary Science University

S.N.	Abbreviation	Full Form
130	NEP	National Education Policy
131	NGT	Next Generation Technology
132	NIAP	National Institute of Agricultural Economics and Policy Research
133	NSC	National Steering Committee
134	NSQF	National Skills Qualifications Framework
135	OP	Operational Policy
136	OPAC	Online Public Access Catalog
137	OUAT	Odisha University of Agriculture and Technology
138	PAU	Punjab Agricultural University
139	PDKV	Dr. Panjabrao Deshmukh Krishi Vidyapeeth
140	PDO	Project Development Objective
141	PG	Postgraduate
142	PI	Principal Investigator
143	PIMS	Project Information and Management System
144	PIU	Project Implementation Unit
145	PJTSAU	Professor Jayashankar Telangana State Agricultural University
146	PMC	Project Management Committee
147	PME	Priority Setting, Monitoring and Evaluation
148	PMTS	Project Monitoring and Tracking System
149	PVNRTVU	P V Narasimha Rao Telangana Veterinary University
150	QBS	Quality Based Selection
151	QCBS	Quality and Cost based Selection
152	RAJUVAS	Rajasthan University of Veterinary and Animal Sciences
153	RF	Results Framework
154	RFID	Radio Frequency Identification Device
155	RFQ	Request for Quotation
156	RLBCAU	Rani Lakshmi Bai Central Agricultural University
157	RPCAU	Dr. Rajendra Prasad Central Agricultural University
158	RVSKVV	Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya
159	SAC	Space Application Centre
160	SAU	State Agricultural University
161	SDG	Sustainable Development Goals
162	SKLTSHU	Sri Konda Laxman Telangana State Horticultural University
163	SKNAU	Sri Karan Narendra Agriculture University
164	SKRAU	Swami Keshwanand Rajasthan Agricultural University
165	SKUAST	Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir
166	SOP	Standard Operating Procedure
167	SRF	Senior Research Fellow
168	SS	Social Safeguard
169	SSR	Self-Study Reports
170	SSS	Single Source Selection
171	STEP	Systematic Tracking of Exchanges in Procurement
172	SVPUAT	Sardar Vallabhbhai Patel University of Agriculture & Technology

S.N.	Abbreviation	Full Form
173	SVVU	Sri Venkateshwara Veterinary University
174	TANUVAS	Tamil Nadu Veterinary and Animal Sciences University
175	TNAU	Tamil Nadu Agricultural University
176	TPRM	Tripartite Review Meeting
177	TTL	Task Team Leader
178	UAS	University of Agricultural Sciences
179	UBKV	Uttar Banga Krishi Viswavidyalaya
180	UG	Undergraduate
181	UGC	University Grants Commission
182	UK	United Kingdom
183	UN	United Nations
184	UNDB	United Nations Development Business
185	USA	United States of America
186	USD	United States Dollar
187	VCSGUUHF	Veer Chandra Singh Garhwali Uttarakhand University of Horticulture & Forestry
188	VNMKV	Vasantrao Naik Marathwada Agricultural University
189	VR	Virtual Reality
190	WB	World Bank
191	WBUAFS,	West Bengal University of Animal & Fishery Sciences

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Foreword

National Agricultural Higher Education Project (NAHEP) launched in 2017 by Indian Council of Agricultural Research (ICAR) in collaboration with World Bank to improve the quality of agricultural higher education in the country. ICAR is bringing the fundamental change through accountability, autonomy and transparency to improve the quality of agricultural higher education in India. NAHEP is addressing the improvement in policies, enhancing quality assurance through accreditation, restructuring academic regulations and governance, effective curricula delivery systems and faculty competence. The digital solutions have been adopted under NAHEP in Academic Continuity. Upgradation in the infrastructure and facilities such as smart classrooms, adoption of online examination system, development of e-learning modules, learnings through Augmented Reality (AR) and Virtual Reality (VR) are effectively enabling the ICAR AU system to keep up the pace of development nationally and internationally. Project Implementation Unit (PIU) of NAHEP has been implementing the projects across **58 Agricultural Universities (AUs)** of ICAR. PIU with the requisite support from partner AUs and institutions has made significant efforts towards successful implementation of the project. The Annual Report illustrates the activities undertaken, achievements made, and success stories reported under different components of the NAHEP during the year 2020-21. The project progress has been closely monitored, discussed and reviewed by National Steering Committee (NSC), Project Management Committee (PMC), Agricultural Higher Education Programme Committee (AHEPC) and World Bank Mid-Term Review (MTR). I am happy that continuous feedback and suggestions made during these meetings have enabled the project to yield the desired results. The trainings and workshops majorly conducted under IDP and CAAST components, have laid emphasis on enhancing employability and building entrepreneurship capabilities of students. Around **238 MoUs** with industry partners / Higher Education Institutions (HEIs) have been signed for technology transfer, knowledge exchange and trainings. It is also important to note that, **6 additional AUs** have **submitted their SSRs** for ICAR accreditation with pronounced support and interventions through NAHEP. Strengthening of key digital infrastructures of ICAR AU system through establishment of ICAR - DC, e-learning portal, implementation of **Academic Management System in 52 AUs,** development of KVC-Alnet, Virtual Classrooms & Agri-DIKSHA - a Web Education Channel were few salient initiatives undertaken to bring institutional reforms in ICAR- AU system. NAHEP has also organized KRITAGYA - A National Level Agtech Hackathon to provide opportunity to students to present their innovative approaches & potential solutions to promote farm mechanization in India.

I acknowledge the support of the Task Team Leader of NSC, PMC and AHEPC. I appreciate the commendable efforts made by National Director and his team in developing this report. I am hopeful that NAHEP will play an important role in creating lasting impacts on agricultural growth and development in the country.

(T. Mohapatra)

Dated the 20th December 2021

New Delhi

राष्ट्रीय कृषि उच्चतर शिक्षा परियोजना (राकृउशिप)
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राष्ट्रीय निदेशक (राकृउशिप)/ National Director (NAHEP)

Preface

Indian Council of Agricultural Research (ICAR) with financial assistance from World Bank has launched National Agricultural Higher Education Project (NAHEP) with an aim to transform the agricultural higher education in the country. Towards the aim of enhancing the quality and relevance of agricultural higher education, project has made significant efforts over the last three years. The project was formulated to improve the quality of education by extending support to partner AUs in enhancing student learning outcomes, improving faculty research effectiveness, attracting better students, supporting in establishing linkages with industry and other HEIs along with supporting digitization of the overall academic eco-system. **The Annual Progress Report 2020-21 presents the implementation progress of NAHEP and highlights the significant achievements made during the mentioned period.**

During last one year, project implementation has witnessed significant achievements despite Covid-19 disruptions. Till March 2021, **58 Agricultural Universities** across the country were awarded projects under different components of NAHEP. In order to address the unforeseen challenges posed by Covid 19 pandemic, PIU, NAHEP and awarded AUs developed requisite Covid related guidelines and adopted multiple digital initiatives to ensure the effective implementation of project. During nationwide lockdown of Covid- first wave, partner AUs readily adopted digital teaching, learning and performance assessment methods. In **May'20,** PIU - NAHEP conducted an **online survey on the Covid-19 impact and initiatives undertaken** by partner AUs of NAHEP, wherein analysis reveals that **> 50%** of partner AUs were using Microsoft teams and Google hangouts, and **~20% AUs** were using other applications for day-to-day project operations, communications and capacity building activities *(>1500 project related webinars have been organized by partner AUs till March'21).* During pandemic period, PIU - NAHEP constantly organized **the online review meetings including NSC, PMC & AHEPC and virtual handholding sessions** for partner AUs on procurement, M&E and finance to address the key challenges faced by AU's. In last year, World Bank in consultation with PIU NAHEP has also organized **Mid Term Review** of the project.

Despite Covid related disruptions, NAHEP has made significant efforts towards **Academic Continuity** while upgrading and developing teaching and research infrastructure, establishing industry-academia linkages, organizing webinars to impart the trainings for students as well as faculties and also helping transfer relevant technologies to the industry etc. In addition to regular monitoring of sub- projects through **Project Monitoring and Tracking System (PMTS)**, central M&E team of NAHEP has taken many important initiatives during ongoing pandemic period. These activities entail assessment of the measurable intermediate outcomes through Mid-line survey, Development and implementation of AU Implementation Performance

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Scoreboard (AUIPS), Satisfaction mapping of direct project beneficiaries, organizing M&E Clinics etc. The procurement and financial progress have also been closely monitored and expedited through multiple rounds of **online review meetings and virtual handholding sessions.**

Documenting key achievements and learnings through various publications at project as well as sub-project levels have also been accomplished

During the entire project implementation period, a constant encouragement, guidance and support extended by Dr. Trilochan Mohapatra, Secretary, DARE & Director General, ICAR has been of immense help to the project team in building momentum for effective project implementation. The constant support and advice in administration of the Project provided by Shri. Sanjay Kumar Singh, Additional Secretary, DARE & Secretary, ICAR and in financial management by Shri Bimbadhar Pradhan, Special Secretary and Financial Adviser, DARE/ICAR is duly appreciated. The directional contributions of Vice Chancellors (VCs) at awarded AUs have been instrumental to the project. Needless to say, the suggestions and inputs of members of NSC, PMC, AHEPC have played an important role in effective implementation of NAHEP. We highly appreciate the regular support and guidance of the current Task Team Leader (TTL) of NAHEP from World Bank - Mr. Bekzod Shamsiev as well as the earlier TTL - Mr. Edward W. Bresnyan and WB team. Special to mention, the contribution of Dr. R B Sharma, NC – IG, Dr. P. Ramasundaram, NC- IDP, Dr. Hema Tripathi, NC – M&E, SS and ESS, Dr. Prabhat Kumar, NC – CAAST & Component 2; Mr. N. K. Arora, Deputy Director-Finance, Mr. Dilip Roy, Deputy Secretary & Procurement Officer and Mrs. Ritu Chahal, Finance and Account Officer; Mr. G.P. Sharma, Director- Finance and his entire team; staff of personnel section of ICAR; staff of Education Division; PIs and nodal officers of awarded AUs along with Consultants and other technical and support staffs have been noteworthy in effective planning and implementation of the project. Acknowledgement is also due to Mr. Guna Nand Shukla, Mr. Arvind Jha and Mr. Nilesh Deshmukh, M&E consultants from PricewaterhouseCoopers Pvt. Ltd. (PwCPL) for providing support to the project as well as in compilation, drafting and editing of this report.

Dated the 14th December 2021
New Delhi

(R.C. Agrawal)

Executive Summary

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 competitiveness 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.

NAHEP is implemented by ICAR (GoI) and World Bank with the total project cost of USD 165 Million (INR 1100 Cr approximately at 1USD=INR 64.47 as on June 1, 2017)[1], having 50:50 cost sharing between GoI and World Bank. Details have been tabled below:

NAHEP Cost by Component	Budget	
	USD Million	INR Crores
1. Support to Agricultural Universities		
1a. Institutional Development Plans (IDPs)	69.4	447
1b. Centres for Advanced Agricultural Science and Technology (CAASTs)	46.2	297
1c. ICAR Innovation Grants to AUs	30.8	198
2. Investment in ICAR in Agricultural Higher education	10.4	67
3. Project Management and Learning	8	51
4. Front-end Fee	0.2	13
Total	**165**	**1,063**

The beneficiaries of NAHEP include **75 institutions** that form the ICAR-AU System, which encompasses **64 State-level AUs, 4 Deemed Universities, 4 Central Universities with Agricultural Faculty and 3 Central Agricultural Universities. Direct project beneficiaries of the project are those students and faculties, who directly derive benefits under IDPs, CAASTs, IGs and activities under Comp 2.**

Till June 2021**, 58 Agriculture universities (AUs)** have been awarded under NAHEP, **wherein 18 AUs come under IDP, 16 AUs under CAAST and 24 AUs under IG in component 1. Besides 3 ICAR institutes i.e., ICAR- Indian Agricultural Statistics Research Institute (IASRI), ICAR-National Institute of Agricultural Economics and Policy Research (NIAP) and ICAR- National Academy of Agricultural Research Management (NAARM) have been implementing Component 2 of NAHEP**. Project details encompassing name of awarded AUs, Component, Title of project, thematic areas and fund sanctioned are placed at **Annexure.**

Component of NAHEP	Key objectives & focus	Awarded institutions
1. Support to AUs		
1a. Institutional Development plans (IDP)	Quality enhancement, thrust on business entrepreneurship & employability, Internal Revenue Generation; focus on **UG students**	18
1b: Centres for Advanced Agricultural Science and Technology (CAAST)	Scientific entrepreneurship, employability and research effectiveness; focus on **PG students**	16
1c. Innovation Grants (IG)	Attain accreditation with revised norms and standards of ICAR	24
2. Investments in ICAR	Institutional reforms	3
Total Beneficiary institutes covered under NAHEP		**62**

IDP financed activities majorly focus on **teaching and research infrastructure development, faculty development and training, networking and industry collaboration, vocational training, students job placement, own revenue generation.** Till June 2021, students and faculties together have completed the international level trainings in reputed foreign universities on **101 different subject areas hosted by 45 different international institutions**. Also, more than **3000 national level workshops / seminars** have been conducted for UG level students under IDP. Among these trainings and workshops, high impetus has been laid on **enhancing employability and building entrepreneurship capabilities of agri students, so that the ripple effect of program in society could be enhanced.** Moreover, industry visits and Skill development programs have also been organized majorly to cater the current market needs and enable the students to emerge as **"Job Creators"** rather than **"Job Seekers".**

Under CAAST Component, 16 sub-projects have been awarded to AUs, spread across 11 states of the country. The major activities undertaken by AUs under CAAST component include **strengthening of teaching and research infrastructure, Distinguished Lecture Series/ Special lectures to bring about much needed vibrancy in the academic atmosphere and inspire students and faculties to perform better, National and International trainings for students, faculties and research scholars, Collaboration with private sector related to the specialized areas to develop market-oriented programs** etc. Till June 2021, students have completed international trainings in **more than 43 emerging areas from 40 international HEIs spread across 15 different countries** whereas **more than 2,500 national level trainings / seminars** have been conducted to develop scientific entrepreneurship of students and enhance research effectiveness.

IG projects have been awarded to select participating AUs to attain accreditation. Till date, 24 sub-projects were awarded under this component. Key IG activities include **national level trainings for faculty upgradation, master and Ph.D. sandwich programs, alumni linkages, industry seminars and professional workshops, e- enabled learning activities** etc. It is worth mentioning here that, in last two years **7 AUs** under the IG have attained ICAR accreditation due to NAHEP support and interventions. Due to ongoing Covid – pandemic, PRT reviews of few additional AUs are pending with ICAR-Agricultural Education Division and shall be completed at the earliest in current FY.

Component 2 aims to support ICAR to carry out institutional reforms within ICAR and enhance effectiveness in coordinating, guiding and managing agricultural higher education in the country. Till date, activities undertaken **entail strengthening of key digital infrastructures of ICAR AU system such as ICAR- DC, establishment of KRISHI Megh - a disaster recovery centre (cloud infrastructure), launch of AGRI-DIKSHA - an Agri Web Education Channel, implementation of Academic Management System in 53 AUs, development of e-learning portal, establishment of 5 CDC and 1 FDC, organization of external advisory panel committee meeting**.

The major activities and achievements under Monitoring and Learning component include regular monitoring of sub- projects through **Project Monitoring and Tracking System (PMTS), capacity building activities, documentation of learnings and achievements etc**. In addition to these activities, central M&E team has taken other important initiatives as well such as **assessment of the measurable intermediate outcomes through Mid-line survey, Development and implementation of AU Implementation Performance Scoreboard**

(AUIPS), Satisfaction mapping of direct project beneficiaries, organizing M&E Clinics etc. In order to establish a fair and transparent system, while effectively addressing the grievances of project stakeholders, a 3 tier **Grievance Redressal Mechanism** has also been established at PIU NAHEP and has been made fully operational.

In addition, PIU has also taken various initiatives to enhance the learning outcomes such as **Waste to Wealth and linking entrepreneurship, Clean and Green Awards, KRITAGYA AgTech Hackathon, Promoting Resilient Agricultural Education System (RAES), Strategic study to assess the requirement of human resources in agriculture and allied fields for next 20 years** etc. These initiatives under PIU have commenced during the FY2020-21 and would play a pivotal role in improving the overall quality and relevance in agri higher education in the country. The infrastructure developed, teaching, learning and skill upgradation initiatives under NAHEP are very much aligned with the **National Education Policy (NEP) 2020 formulated by Government of India**.

This Annual Report of NAHEP highlights the outcome focused achievements made under different components of NAHEP, financial and procurement progress. In addition to observations made in the report, timely reviews and course corrections suggested by NAHEP governance and World Bank would further facilitate in the effective implementation of project.

Introduction

Over the years, approaches of teaching and learning practices have evolved through adoption of various digital and disruptive initiatives. These initiatives have brought in a paradigm shift in the tertiary education across the world. With increasing globalization of higher education services, imminent and emerging concerns over quality, standards and recognition of agricultural higher education in India are being addressed through "NAHEP". The present situation demands a renewed thrust for enhanced quality and relevance of higher agricultural education. This would facilitate and help to upgrade capacities for developing self-motivated professionals and entrepreneurs in view of the changing scenario of globalization of education and emergence of newer areas of specialization. Under NAHEP, the ICAR is in a process of bringing fundamental change in its approach and control, financial sustainability, accountability, autonomy, transparency, and meritocracy towards improving quality and relevance of higher agricultural education in the country. Strategically, NAHEP aims to strengthen India's presence in the higher agricultural education system with skilled manpower capable of achieving higher productivity with limited resource, generating need-based technologies, and improving productivity and efficiency in the entire value chain. Along with the enhancement in the teaching and learning experiences and development or upgradation in cutting edge technologies, NAHEP will take a step forward to enable the selected excelling partners (AUs) to improve their rating/ranking/scoring, further. Moreover, NAHEP has also been complementing to the efforts made nationally in meeting the key Sustainable Development Goals (SDGs), promoted by United Nations (UN). Key SDGs addressed by NAHEP interventions are **Goal 4 - Quality Education, Goal 2 - Zero Hunger, Goal 8 - Decent Work and Economic Growth, Goal 9 - Industry innovation and infrastructure, Goal 7 - Affordable and Clean Energy, and Goal 5 - Gender equality.** While the domino effect of enhanced 'quality' and 'relevance' of higher Agri- education may be envisaged at multiple realms of the national development process, ICAR and AU systems emerge as the most important beneficiary.

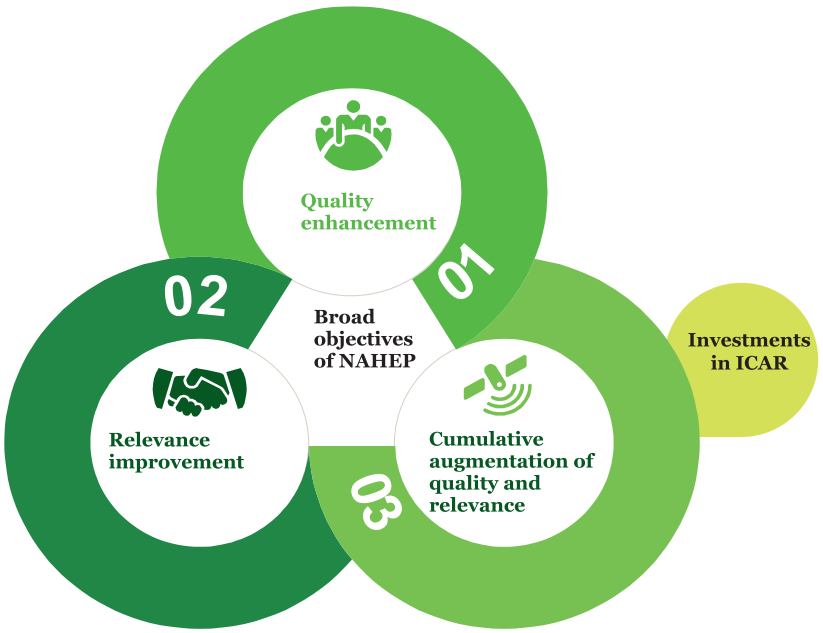
Project Objectives

The overall objective of the **NAHEP** is to support Participating Agricultural Universities and ICAR in providing more relevant and higher quality education to the students. **NAHEP** addresses quality by supporting interested AUs to propose and implement technically sound and verifiable investments that increase faculty performance, attract better students to these AUs, improve student learning outcomes and raise their prospects for future employability, particularly in the private sector.

Quality enhancement:	Interested AUs propose and implement technically sound and verifiable investments which are named as "Institutional Development plans" (i.e., IDPs), Investments in Centers for Advanced Agri science & Technology (i.e., CAAST) and Innovation Grants (IG). These components are focused to enhance faculty – student learning environment, improve the learning outcomes and make students more employable.
Relevance improvement:	Relevance is ensured under the project through greater alignment of academic curricula and course content with the skill sets being demanded in the agriculture and allied services sector; and expanded certificate-level vocational courses to fill the gap for trained technical personnel, especially in market-led extension. The overall approach is to meet the demand in market by re-orienting the skill sets at AUs, especially in the Agricultural higher education and avoid a mis-fit situation.
Cumulative Augmentation of Quality & Relevance:	Finally, both quality and relevance are augmented through investments in ICAR that improve its ability to set and enforce standards across the ICAR-AU System and build international cooperation to the benefit of agricultural higher education across the nation.

NAHEP endeavors increased agricultural productivity and support quality improvements of higher education and ensure more skilled workforce that continuously improves the productivity of key sectors, including agriculture. The project is also a multi-Global Practice collaboration (Agriculture and Education) and is expected to support activities and results directly related to cross-cutting strategic areas of climate change, jobs and gender.

Exhibit: Broad objectives of NAHEP



Quality enhancement:

- Increase faculty performance,
- Attract better students to AUs,
- Improve student-learning outcomes and raise prospects for future employability

Relevance improvement:

- Market orientation of academic curricula and course content
- Expanded certificate-level vocational courses

Cumulative augmentation of quality and relevance:

- Set and enforce standards across the ICAR-AU System
- Build international cooperation for the benefit of agri higher education

Project Components

The objective of the NAHEP is aimed to achieve through implementation of **three** unique but mutually impacting components, these are:

Component 1: Support to Agricultural Universities

This includes financing investments by participating AUs to improve the quality and relevance of agricultural education and research for agricultural transformation. This component also includes competitively awarding significant additional resources to participating AUs and finance goods, works, non-consulting services, training and consultants' services. This component is further broken down into three sub-components:

Component 1a: Institutional Development Plans (IDPs)

This sub-component includes provision of Institutional Development Plans (IDPs) to reform-ready and competitively selected participating AUs. The IDPs seek to improve:

(a) Learning outcomes and future employment for AU students; and

(b) Faculty teaching performance and research effectiveness.

Component 1b: Centre for Advanced Agricultural Science & Technology (CAAST)

Through this sub-component, selected participating AUs receive grants for the establishment of Centers for Advance Agricultural Science and Technology (CAAST), multidisciplinary centers for teaching, research and extension on critical and emerging agricultural topics. The location and themes of proposed CAASTs are decided after consultations, followed by competitive allocation.

Component 1c: Innovation Grants (IGs)

This sub-component provides grants to selected participating AUs for the carrying out of Innovation Plans. They aim to support technical assistance and consultant services, including those required to:

(a) Make AUs reform ready (i.e., attain accreditation); and

(b) Promote mentoring of non-accredited AUs by existing reform ready AUs and other interstate and international academic partnerships.

Component 2: Investment in ICAR Leadership in Agricultural Higher Education

This component aims to finance institutional reforms within ICAR to enhance ICAR's effectiveness in coordinating, guiding and managing agricultural higher education. It also aims to enhance ICAR's interactions with AUs and key stakeholders nationwide through interventions that increase the quality and relevance of agricultural higher education. Goods, training, consultant services and non-consulting services and incremental operating costs are financed under this component. The said component majorly includes the following:

a)	Assessing different possible options in the administration and award of ICAR's technical and financial assistance to AUs
b)	Structuring dialogue with State governments to catalyse their participation in raising the quality and relevance of agricultural higher education
c)	Helping participating AUs for the development of IDPs, CAASTs and Innovation Plans
d)	Establishing partnerships with globally recognized agricultural higher education institutions
e)	Developing digital information systems for agricultural data collection, analysis and dissemination
f)	Improving curricula review processes and methods to consolidate and disseminate global best-practices in agricultural education
g)	Improving the all-India entrance examination in agriculture, including an on-line national examination system
h)	Adopting next-generation management systems covering information, procurement, contract and financial management areas
i)	Coordinating an External Advisory Panel of renowned agricultural education experts
j)	Assisting agricultural universities to strengthen their linkages with industry and
k)	Promoting the establishment of centers for career development at agricultural universities.

Component 3: Project Management and Learning

This component of Project Management and Learning finances goods, works, non-consulting services, training and workshops, and consultants' services for the Project (other than those financed under subprojects) and incremental operating costs. This component includes strengthening of ICAR's management capacity for project implementation, including:

(a) Establishment / maintenance of NAHEP-Project Implementation Unit, Steering Committee, Technical Committee and M&E Cell to ensure compliance with Project's procurement, financial management, safeguards and reporting requirements, and administration, supervision, monitoring and evaluation of IDP Grants, CAAST Grants and IGs and/or proposals.

(b) Training to ICAR and participating AUs to achieve and sustain increased quality, relevance and effectiveness of agricultural higher education.

Project Cost & Financing pattern

NAHEP is implemented by ICAR with the total project cost of **USD 165 Million (INR 1100 Cr approximately)**[1], having 50:50 cost sharing between GoI and World Bank. Details are presented below:

Exhibit: Project Cost and financing pattern (in USD Million)

Name of the component	Total	Share of Budget by component
1. Support to Agricultural Universities	**146.4**	**89%**
1a. Institutional Development Plans	**69.4**	**42%**
1b. Centres for Advanced Agricultural Science and Technology	**46.2**	**28%**
1c. Innovation Grants	**30.8**	**19%**
2. Investment in ICAR in Agricultural Higher Education	**10.4**	**6%**
3. Project Management and Learning	**8**	**5%**
Front-end Fee	**0.2**	-
Total	**165**	**100%**

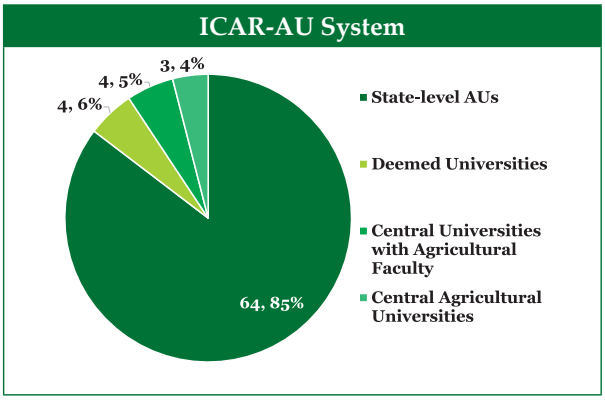
Source: NAHEP-Project Appraisal Document-World Bank

Since WB and GoI jointly finance this project, timely strategic inputs for effective implementation of projects are continuously being provided by both the funding partners.

Project Beneficiaries

The beneficiaries of NAHEP comprise of **75 institutions** that form the **"ICAR-AU System"**, which encompasses 64 State-level AUs, 4 Deemed Universities, 4 Central Universities with Agricultural Faculty and 3 Central Agricultural Universities.

Direct beneficiaries of the project are those students and faculties, who directly derive benefits under IDPs, CAASTs, IGs and activities under Comp 2.



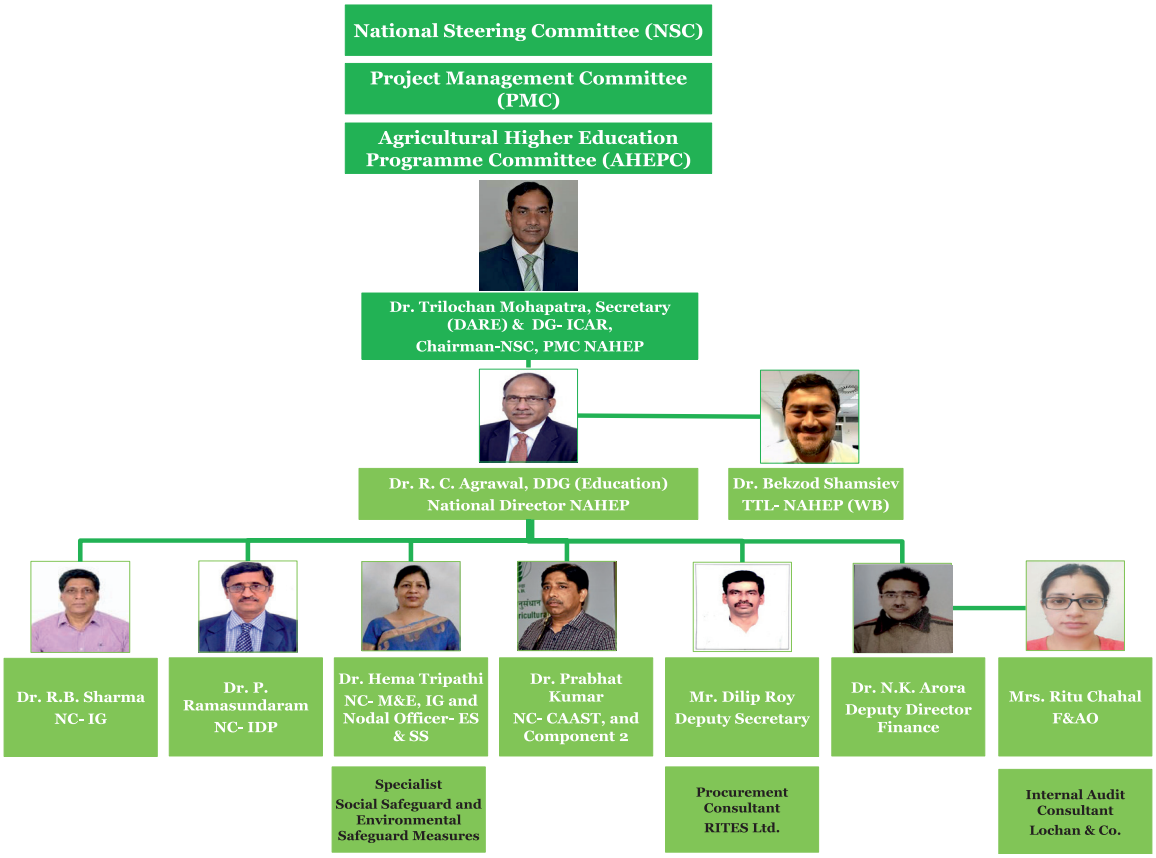
Key beneficiaries & Emerging benefits to them	
Students	▪ Enhancing quality and relevance of teaching and research from new learning-centered education, leveraging ICT and external partnerships. ▪ Effective stakeholder participation in curricula development, pedagogy options and course evaluation; and ▪ Expanded learning and academic environment to sharpen student's skill sets for their improved employability.
Faculties	▪ Increasing collaboration among Indian AUs and with other international universities to raise research quality and educational quality and relevance ▪ Training and capacity building to improve the delivery of education and its learning outcomes.
Institute	▪ Governance & transparency, Infrastructural development ▪ Productive campus culture and intensive use of technology enabled learning

Project Implementation: Governance mechanism

NAHEP was approved in **October 2017**[2] and subsequently the loan agreement was signed in the same month. The project commenced operation effectively from **November 2017**. During inception stage, several key documents like Project Implementation Plan, Expenditure Finance Committee (EFC) document, Procurement Plan and Guidelines, FMS manual and other project relevant documents were developed.

The Education Division of ICAR is implementing NAHEP. The governing structure of NAHEP comprises of National Steering Committee (NSC), Project Management Committee (PMC), Agricultural Higher Education Programme Committee (AHEPC) and Project Implementation Unit (PIU).

Exhibit: Overall Governance structure for NAHEP implementation



*As on March 2021

Structure and roles of each of the committee and level is as detailed herewith.

National Steering Committee (NSC):

The Steering Committee headed by the Director General, ICAR is the apex body of NAHEP, providing strategic and policy guidance to the project. The composition of NSC is as follows:

S. No.	Name & Designation	Position
1.	Shri T Mohapatra, Secretary (DARE) & DG, ICAR	Chairman
2.	Shri Sushil Kumar, AS(D) & Secretary ICAR	Member
3.	Shri Bimbadhar Pradhan, AS & FA, DARE & ICAR	Member
4.	Dr. P L Gautam	Member
5.	Dr. B. S. Dhillon, VC, PAU, Ludhiana	Member
6.	Dr. Arvind Kumar, VC, RLBCAU, Jhansi	Member
7.	Dr. Renu Batra, Addl, Secy. UGC	Member
8.	Dr. R K Singh, Director IVRI	Member
9.	Mr. Umesh Mishra, General Manager, KRIBHCO	Member
10.	Dr. M Ramasamy, CMD, Rasi Seeds, Tamilnadu	Member
11.	Ms. Vinita Agrawal- DG NSDA	Member
12.	Mr. Krupakar Wasnik, Add. Commissioner, (MoA&FW)	Member
13.	Dr. R.C Agrawal- ND NAHEP	Member Secretary

Project Management Committee (PMC):

Director General, ICAR chairs PMC and has direct executive responsibilities for sanctioning/ endorsing the proposed sub-projects and overseeing the effective and efficient implementation of the entire project, resource management and usage, and M&E activities. The composition of the PMC is as follows:

S. No.	Name & Designation	Position
1.	Shri T Mohapatra, Secretary (DARE) & DG, ICAR	Chairman
2.	Shri Sushil Kumar, AS(D) & Secretary ICAR	Member
3.	Shri Bimbadhar Pradhan, AS & FA, DARE & ICAR	Member
4.	Dr. A.K. Singh, DDG (Horticultural Sciences), ICAR	Member
5.	Dr. B. N. Tripathi, DDG (Animal Sciences), ICAR	Member
6.	Dr. R.C. Srivastava, Vice Chancellor, CAU, Samastipur	Member
7.	Dr. Gopal Krishna, Director, CIFE – ICAR, Mumbai	Member
8.	Mr. S. Sivakumar, Group Head – Agri-Business, ITC Limited	Member
9.	Mr. K.K. Narayan, MD, Metahelix Life Sciences, Bangalore	Member
10.	Dr. R.C Agrawal- ND NAHEP National Director (NAHEP)	Member Secretary

Agricultural Higher Education Programme Committee (AHEPC):

The members of the AHEPC are being proposed by the Project Implementation Unit (PIU) and approved by the PMC. This committee is responsible for awarding sub-projects and their effective and efficient implementation. **Total 58 projects viz. 18 under IDP, 16 under CAAST and 24 under IG have been approved and awarded till date.** The composition of the AHEPC is as follows:

S. No.	Name & Designation	Position
1.	Dr. R.C Agrawal- ND NAHEP	Chairperson
2.	Dr. Hari C. Sharma, Ex. Vice Chancellor, YSPUH&F	Member
3.	Dr. Rajendra Prasad, VC, UAS Bangalore	Member
4.	Dr. Nazeer Ahmed, Vice Chancellor, SKUAST	Member
5.	Dr. M.S. Chauhan, Director, NDRI, Karnal	Member
6.	Dr. V. S. Thakur, Ex. Vice Chancellor, YSPUH&F	Member
7.	Dr. Sudha Rao, Ex. VC, Karnataka University,	Member
8.	Prof. Rajiv Kumar, Advisor-I, AICTE	Member
9.	Dr. C. S. Prasad, Ex-VC, MAFSU & Ex-DDG (AS)	Member
10.	Dr. H. K. Senapati, Ex-Dean (PGS), OUAT	Member
11.	Dr. S. Narayanan, Sr. Vice President, Jain Irrigation	Member
12.	Dr. Raju Barwale, Managing Director, MAHYCO	Member

Project Implementation Unit:

The Project Implementation Unit (PIU) is responsible for the overall project implementation, coordination and facilitation under the guidance and supervision of Project Management Committee (PMC). The PIU has been established within the Education Division of ICAR and is led by National Director (ND). The detailed list of PIU team has been presented in Annexure -I.

Key meetings held by NAHEP governance are presented herewith.

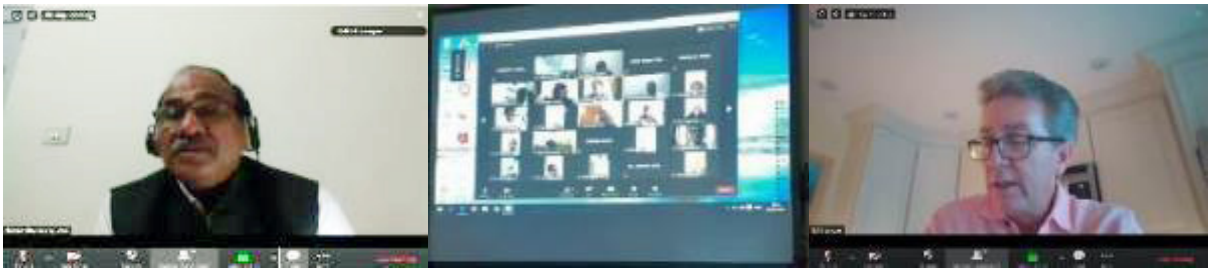
S. No.	Meetings	Date
1.	NAHEP Annual Review Meeting	27th-28th May 4th -5th and 24th June, 2020
2.	TPRM Meeting	16th -17th June 2020
3.	PMC Meeting	13th August 2020

S. No.	Meetings	Date
4.	TPRM Meeting	22nd -24th September 2020
5.	Mid-term Review-World Bank	9th -14th September 2020
6.	NSC Meeting	21st October 202o
7.	AHEPC Meeting	5th January 2021
8.	TPRM Meeting	20th-22nd January 2021

The various committees and the governance structure of NAHEP have been responsible for the overall project implementation. The same were achieved not only because of time-bound response mechanism but also coordinated communication amongst the participating AUs, ICAR, World Bank and other key stakeholders. PIU-NAHEP and awarded AUs have timely incorporated the recommendations and salient inputs made during NSC, PMC, AHEPC and other review meetings to ensure the effective implementation of project.

Over and above the implementation discipline, during the year, all convenings were conducted through online platform because of the social distancing norms imposed due to Covid-19.

Exhibit: Glimpse of NAHEP Annual Review Meeting organised during June 2020



The major achievements and activities undertaken within NAHEP during 2020-21 have been presented in the subsequent chapter.

NAHEP - Key Activities & Achievements

Major activities and achievements made under different components of NAHEP project during FY 2020 – 21 are presented herewith.

I. Component 1 (Support to Agricultural Universities)

A. Component 1a (Institutional Development Plans)

As mentioned earlier, IDP financed activities are more oriented towards capacity building and governance reforms, leading to **the greater autonomy and sustained accreditation of the University**. The key provisions for funding under IDP include students' skill and entrepreneurial development, enhancing learning outcome and **teaching effectiveness, faculty development and training, networking and industry collaboration, vocational training, students job placement, own revenue generation and support to twinning plan**.

In addition to these priorities, emphasis is also being placed on **effective industry linkages to enhance employability of agriculture graduates as well as to help AUs to generate their own resources through establishing facilitative Centres**. Renewed public-private partnership efforts **would also strengthen stakeholder's role in curriculum design, course evaluation and overall faculty and student development**. Over and above these, the digitization of academic activities under IDP (NAHEP) helped to insulate AUs from the social distancing restrictions imposed due to Covid-19 in the country. It helped to convert the restrictions, from a deep crises into opportunity for increasing digitization and effectively implement the Academic Continuity plan. Students and faculties could access the study materials, attend the classes, complete the assignments, and even attend the examinations from anywhere due to digital intervention developed by partner AUs.

These initiatives would help the agricultural higher education system in India to produce quality graduates with desired traits and experience along with requisite skills in innovation, entrepreneurship, and agribusiness getting cumulated to the existing stock of human capital in agricultural education, research and industry.

a) Geographical distribution of partner AUs awarded under IDP

Till FY2020-21, IDP awarded the sub-projects to 18 AUs, spread across 15 states/UTs in the country. Total budget outlay of the component is **USD 69.4 Mn (INR ~462 Crores**). The geographical distribution of the AU awarded under IDPs is a tabulated herewith:

State/UT	Partner AUs	State/UT	Partner AUs
1. Andhra Pradesh	1. ANGRAU, Lam (Guntur)	**9. Odisha**	10. OUAT, Bhubaneswar
2. Assam	2. AAU, Jorhat	**10. Punjab**	11. GADVASU, Ludhiana
3. Gujarat	3. JAU, Junagadh	**11. Rajasthan**	12. MPUAT, Udaipur 13. SKNAU, Jobner
4. Haryana	4. NDRI, Karnal, 5. CCS HAU, Hissar	**12. Tamil Nadu**	14. TANUVAS, Chennai, 15. TNAU, Coimbatore
5. Himachal Pradesh	6. DYSPUH&F, Solan	**13. Uttarakhand**	16. GBPUAT, Pantnagar
6. Karnataka	7. UAS, Dharwad	**14. UP**	17. DUVASU, Mathura
7. Madhya Pradesh	8. RVSKVV, Gwalior	**15. J&K**	18. SKUAST, Kashmir
8. Manipur	9. CAU, Imphal		

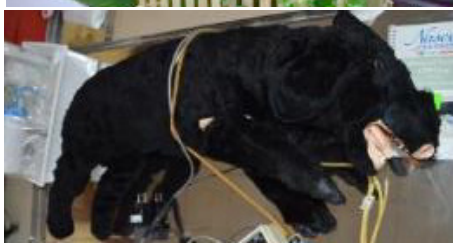
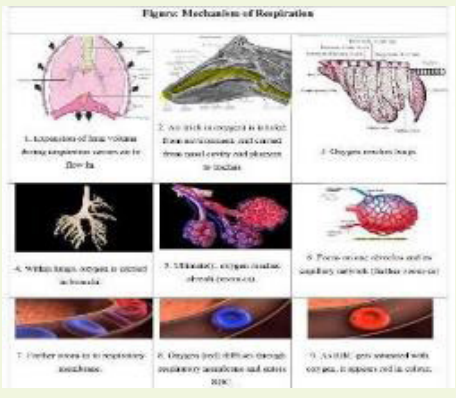
b) Key activities undertaken

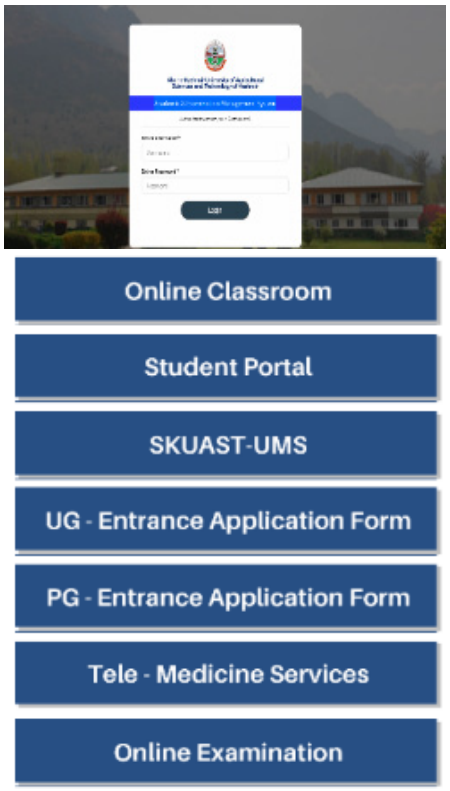
During the current implementation period, altogether 18 AUs (as presented in the table above) were involved in carrying-out the NAHEP- IDP activities. Due to social distancing measures in place, most of the capacity building programs were conducted through virtual mode. For strengthening the digital infrastructure, partner AUs under IDP have made significant efforts such as development of e-course contents, online examination platform, virtual learning platforms, e-content creation etc. Such digitally embedded infrastructures have

not only continued the academic activities but also have widen the horizon of the learning avenues for students. Over and above this, the partner AUs have also taken initiatives like alumni engagement through virtual mode, organizing guest lecture series from industry experts, entrepreneurial activities, upgradation in existing scientific educational material, industry collaborations and student placement activities.

Digital interventions to improve learning outcomes

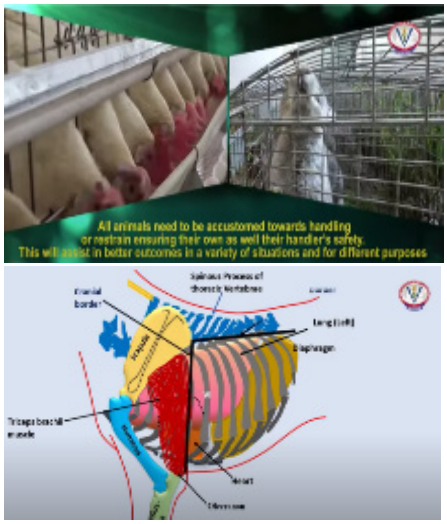
During the year, digital interventions undertaken at partner AUs under IDPs have played a pivotal role in improving the learning outcomes of students. Over the last year, IDP AUs have taken various digital initiatives such as development of Learning and Assessment Centre (LAC), establishment of e-content studio, conducting online examinations of students, development of AI Labs, trainings on digital automations etc. Digital infrastructure followed by virtual mode of activities facilitated to reduce operational cost on one side and also increased access to global resources on the other side. These digital interventions have been developed with an intention to improve the academic, research and teaching effectiveness of faculties and students' learning outcomes. Along with these direct intended benefits, such interventions would improve **placement rates, on-time graduation rates, research effectiveness of faculties in medium and long run**. Below are some of the key initiatives undertaken by partner AUs of IDP.

Digital Intervention	Brief	Photograph
Learning and Assessment Centre (LAC) by TANUVAS, Chennai	• Partner AU has established LAC facilities wherein actual size animal simulations have been enabled with Holstein dystocia simulator, Haptic Vet Cow simulator, Canine Surgical simulator etc. • These simulation models are being used to provide the real near experience to the students without harming the actual animals. • Practical sessions were organised for students in LAC to enhance the learning outcomes of the students and to provide the clinical experience of various categories of animals / species.	 
Development of e-content studio at GBPUAT, Pantnagar	• To promote a 360^0 learning environment in AU, partner AU has developed the interactive user-friendly e-modules at **e-content studio**. • **More than 100 faculties** of the partner AU have collectively made efforts for the development of textual, hyperlinked photos, animations and video linked e-content modules. • The e-content created in interactive workbook format with Q&A, references, cases, illustrations, learning activities and other interactive linkages. • Till FY2020-21, more than 500 such modules have been developed and are being streamed online through e-module portal developed by partner AU under NAHEP.	 

Digital Intervention	Brief	Photograph
Academic & Eamination Management System developed by SKUAST, Kashmir	• Partner AU has developed the Academic and Examination Management System, where academic records of the students are being placed in e-records for administration purposes. Also, with the help of application, exams are being conducted virtually amidst social distancing norms imposed due to Covid pandemic. • This application gives access to students on e-content modules, class schedules, academic calendar and enable them to participate in examination without any hassles.	

Virtual learnings for 'Academic Continuity'

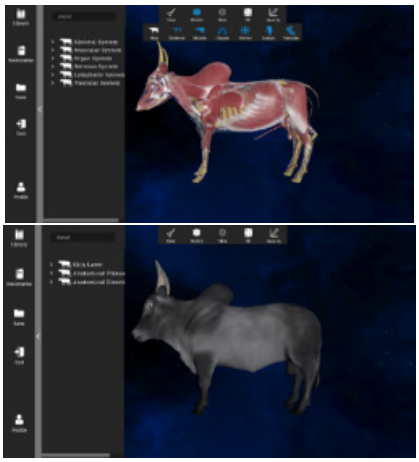
During the pandemic period over the last FY2020-21, Academic Continuity has been the key priority for all the partner institutions to keep the implementation wheel running. Organizing capacity building programs, academic lectures, online examinations, competitions are some of the key initiatives undertaken by IDP partner AUs during the period. More than 1,500 such online programs were organized by partner AUs in last year. Due to social distancing restrictions in place, virtual platforms such as Zoom, Google meet, Microsoft Team, Webex etc. have been used aggressively to connect with the students and to organize virtual training programs, exams, industry internships, national level competitions and other activities. Below are some of the related initiatives undertaken by partner AUs of IDP.

Programs	Brief	Photograph
Animated Video Tutorials on clinical exercises by GADVASU, Ludhiana	• Partner AU has converted various clinical classes into video tutorials to enhance the learning outcome during the Covid pandemic period. • Videos on surgical procedures, Rumenotomy in Bovines, Tube cystostomy in calves & Fiberglass Cast application, approach, handling and restraining of Livestock and Poultry have been developed and uploaded on YouTube channel to continue the seamless learnings during covid disruptions.	

Programs	Brief	Photograph
Massive Open Online Courses (MOOCs) developed by NDRI, Karnal	• During the period, partner AU has developed more than **30 modules on Commercial Dairy Farming, more than 30 on Milk Processing & Value Addition** subject areas. • These e-courses are available for students from August 2020. ▪ Such MOOC courses will support students to attend the classes without being present physically at Campus.	

'Out of box' initiatives undertaken

Partner AUs under IDP have been playing instrumental role in developing innovative infrastructures to improve the learning outcomes of the students, to improve the faculty research effectiveness, to provide the world-class experience of teaching-learnings through digital initiatives etc. Initiatives such as adoption of Augmented / Virtual reality facilities, digitization of libraries, virtual laboratory, language learning modules with innovative smart classrooms, Artificial Intelligence Labs, Robotics and Automation Labs etc. These out of box initiatives undertaken by partner AUs would not only improve the quality of agricultural higher education but would also augment the overall teaching - learning experience. Below are some of such initiatives undertaken by partner AUs of IDP;

Initiatives	Brief	Photograph
Promoting Open Knowledge Environment through AR / VR facility by TANUVAS, Chennai	▪ Partner AU under IDP has developed the e-learning modules of livestock sciences using AR and VR functionalities. ▪ Use of AR and VR functionalities would not only avoid the direct physical interference with live animals during clinical trials but would also provide opportunities to explore & learn the animal anatomy and other clinical procedures in a better fashion. ▪ The simulation model used in these modules provides near real experience of animal organ system, nervous system, vascular system etc. ▪ Moreover, these modules will support the functionalities of conducting mock tests for the students and will provide better orientation aids to the faculties while teaching.	
Artificial intelligence (AI) lab / Centre developed by JAU, Junagadh	▪ The objective behind development of Artificial Intelligence (AI) laboratory is to get students acquainted with advanced technologies such as robotics, drones, agricultural sensors, CAD designing & simulation and precision agriculture. ▪ This laboratory is useful for students and researchers to gain practical knowledge while understanding various advanced techniques of smart farming. ▪ Providing such modern facilities at undergraduate level would also benefit the students to better prepare for the industry and market needs.	

Initiatives	Brief	Photograph
Language lab developed by UAS, Dharwad	▪ Each system in the lab has been equipped with 8 English language modules. Each module has the detailed content followed by assessment. ▪ To improve the academic performance and enhance the participation of students in extracurricular activities, remedial courses in English Language have also been commenced under NAHEP-IDP. ▪ So far, 5 batches of the course have been completed and 120 students have benefitted through the lab.	

Major Collaborations and linkages:

There has been significant progress made by AUs while collaborating with international and national organizations / private players / Higher Education Institutions (HEIs) to strengthen the industry – research and academia linkages. During the year 2020-21, **153 new MoUs** have been signed. Below are the few important examples of collaborations / MoUs undertaken by Partner AUs of IDP:

Name of AU / Institute	Name of Institute / organisation / private player with whom MoU signed
GBPUAT, Pantnagar	• Headstart Network Foundation • Indo-Dutch Horticulture Technologies Pvt. Ltd
SKUAST, Kashmir	• Galilee International Management Institute Israel • PIR bright Institute UK • ROSS School of Business, Michigan • IBM • Lemon School of Business
UAS, Dharwad	• AVT Natural Products Ltd., Chennai • B & C Agri Solutions LLP, Dharwad • HAEGL Technologies Pvt Ltd., Dharwad
OUAT, Bhubaneshwar	• Space Application Centre (SAC), Ahmadabad • Indian Institute of Technology, Delhi
CAU, Imphal	• National Cooperative Development Corporation, New Delhi • Green Biotech Eco solutions Pvt. Ltd., Imphal, Manipur

c) Output-outcome monitoring

S. N.	Additional monitoring indicators	Baseline	Unit of measure	April'20 to March '21[1]	
				Plan	Achievement
1.	% increase in AU on time graduation rate	77	%	83.8	95
2.	% increase in cut-off scores for students in ICAR entrance tests	26	Percentile	28.1	24.9
3.	% increase in student placement rates	41.9	%	45.3	59.0
4.	% increase in faculty research effectiveness	21.2	h-index value	22.8	28
5.	Reduced student inbreeding (% AU students admitted from other states)	19	%	22.0	24
6.	Reduced faculty inbreeding (% faculties with HE degrees from more than one university and more than one state)	45	%	52.2	54

[4] Reported till March 2021

S. N.	Additional monitoring indicators	Baseline	Unit of measure	April'20 to March '21[1]	
				Plan	Achievement
7.	Improved AU revenue generation (% change in Internal revenue of AU)	8.5	%	12	12
8.	Number of direct beneficiaries of the project	0	Number	30,000	110,519
9.	Number of female beneficiaries	0	Number	-	25,859
10.	Number of new facilitative units established to enable academic and research infrastructure *(IIIC-Industry Institution Interaction Cell / Start up cell / incubation cell / placement cell etc.)*	4	Number	98	214
11.	Number of pilot courses added / upgraded on communication skills, entrepreneurial skills, information processing, creative and innovative thinking, leadership skills, industry-oriented courses etc.	10	Number	33	191
12.	Number of MoUs signed with industry for knowledge exchange programs/ internships / short term training programs etc.	0	Number	101	153
13.	Number of faculty training programs (both national and international) organized by AUs	0	Number	94	813
14.	Number of student training programmes (both national and international) organized by AUs	0	Number	292	1,528

As observed in the table above, awarded IDPs have over achieved on indicators such as AU-On-time graduation rate, students placement rates, **pilot courses added / upgraded on communication skills, entrepreneurial skills, information processing, creative and innovative thinking, leadership skills, industry-oriented courses etc, internal revenue generation, faculty and study diversity, number of** MoUs signed with industry for knowledge exchange programs/ internships / short term training programs etc.

IDP AUs have performed remarkably well in establishing new facilitative units to enable academic and research infrastructure such as **innovative labs, placement cells, incubation cells, Learning Assessment Centre, VR and Content Development Studio etc.**

d) Input and activity monitoring

Input / Activity indicator	Sub- head / category	Expenditure / input in INR lakhs	
		Planned	Utilization
Goods and equipment	Equipment, Plant & Machinery	145	19
	Office equipment	192	79
	Laboratory equipment	3,310	1,971
	Furniture & fixtures	515	392
	Computers and Peripherals	1,053	270
	Books and Journals	191	110
Civil Work	Minor repair and renovation work	1,366	822
Human capacity building	International level training	2,091	400
	Short visit/ seminars	172	30
	Meetings and workshops	139	39
Consultancy	National level consultancies	221	71
Recurrent cost / Miscellaneous	Travel	303	42
	Contractual services	1,145	563
	Operational costs	7,821	1,995
	Institutional charges	463	130
	Total	**19,125**	**6,933**

Out of planned INR 191 Cr expenditure across key input categories, utilization under IDP component is INR 69 Cr, i.e., utilization percentage stood at 36% for FY 2020 – 21. More efficient planning is required for specific expenditure heads like equipment, plant and machinery, national level consultancies, and international level trainings, leading to higher utilization percentage. Due to 'no movement during lockdown and restricted movement during phased unlock period by people and goods, the planned activities of procurement, civil work training, visits travel, etc. could not be carried out. Hence, there has been low rate of utilization of funds under these heads.

The IDP investments, give AUs the opportunity to sort out key challenges and to respond to them suitably with proposed interventions. The achievements of quality and relevance attributable to these interventions would be measured through identified PDO and Intermediate indicators throughout the project duration.

B. Component 1b (Centers for Advanced Agricultural Science and Technology)

Under this component, select accredited AUs have been awarded projects for the establishment of Centers for Advance Agricultural Science and Technology (CAAST). These Centers have been developed as multidisciplinary and interdisciplinary in nature for teaching, research and extension on critical and emerging issues of agriculture. 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 activities and research achievements of the AUs under CAAST are spread over a number of thematic areas such as **Conservation Agriculture, Protective/ Saline aquaculture, Climate Smart Agriculture, Precision farming / Farm Mechanization, Secondary Agriculture, Adaptive agriculture, Renewable Energy Sources, Integrated Farming System (IFS), Agriculture Market Intelligence, Good Agricultural Practices, Hitech/Protected Cultivation, Food Safety, Big Data Analysis, Natural Resource Management and Genomics-assisted Breeding**. The advanced centers will be a boost for technology commercialization of Indian agriculture. Besides, the digital intervention will lead to transform the Indian agricultural education to virtual mode.

a) Geographical distribution of partner AUs awarded under CAAST

Over the years of implementation, CAAST has awarded the sub-projects to 16 AUs, spread across 11 states in the country. Total budget outlay of the component is USD 46.2 Mn (INR ~308 Crores).

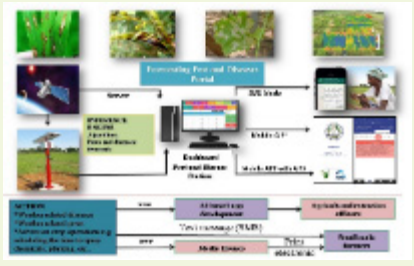
State/UT	Partner AUs	State/UT	Partner AUs
1. Gujarat	1. NAU, Navsari, 2. AAU, Anand	**7. Maharashtra**	8. CIFE, Mumbai, 9. MPKV, Rahuri, 10. VNMKV, Parbhani, 11. MAFSU, Nagpur
2. Himachal Pradesh	3. CSKHPKV, Palampur	**8. Punjab**	12. PAU, Ludhiana
3. Jharkhand	4. BAU, Ranchi	**9. Uttar Pradesh**	13. CSAU&T, Kanpur, 14. IVRI, Izatnagar
4. Karnataka	5. UAS, Bangalore	**10. West Bengal**	15. BCKV, Mohanpur
5. Kerala	6. KAU, Kerala	**11. NCT of Delhi**	16. IARI, New Delhi
6. Madhya Pradesh	7. JNKVV, Jabalpur		

b) Key activities undertaken

During FY 2020-21, the major activities and achievements by AUs under CAAST included technology enabled facilitative centers, development of mobile applications, organization of virtual training programs for students and faculties, establishment of virtual classrooms, development of technologies around genomics, secondary agriculture, precision agriculture etc. Partner AUs have also made efforts towards providing more relevant agricultural higher education through introduction of pilot courses on emerging areas of agriculture and allied sciences, development of virtual tutorials, development of innovative equipment and machineries, establishment of industry-academia linkages, guest lectures from eminent experts etc. Partner AUs under CAAST have also taken out of box initiatives which would not only improve the research effectiveness but also expected to generate the internal revenue in near future through technology commercialization and technology transfer.

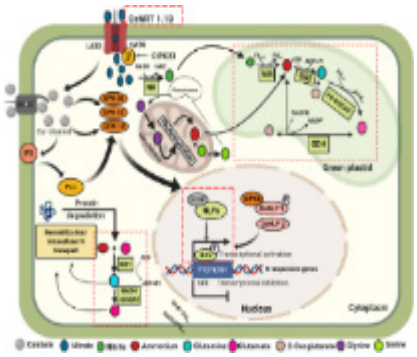
Digital interventions to improve research effectiveness

During the period, partner AUs under CAAST have undertaken various digital interventions to improve the research effectiveness such as development of crop and livestock advisory based mobile applications, development of precision farming tools, next generation technologies for pest and disease management etc. Some of the key digital initiatives undertaken by CAAST partner AUs are placed below.

Initiatives	Brief	Photograph
PAU - Urea Guide App developed by PAU, Ludhiana	▪ Department of Soil Science, PAU has developed the PAU - Leaf Colour Chart (LCC). ▪ PAU-LCC chart application recommends the farmers on the usage of fertilizers and pesticides on the basis of leaf colour combinations ▪ The adoption of the PAU - Urea Guide App based N management practices helps in optimizing the fertilizer N use, increases farmers' income, reduces insecticide and pesticide consumption and also addresses the challenges related to air and water pollution. ▪ The use of PAU - LCC has led to an equivalent grain yield with an average saving of 50-80 kg N per hectare in Rice and 50 kg N per hectare in wheat in comparison with the farmers' usual practice.	
Time variable rate fertilizer applicator developed by MPKV, Rahuri	▪ CAAST CSAWM has developed the real time variable rate fertilizer applicator. ▪ The technology has the precise real time application of fertilizer according to the spatial variability of the field. Also, it helps in reducing the fertilizer usages by around 10 - 25%. ▪ The developed technology will save the cost of production and protect the environment by reducing leaching.	
Solar operated power sprayer developed by VNMKV, Parbhani	▪ The IoT based camera is mounted for monitoring and addressing both voice and video signals are continuously being transmitted on the 4G communication network for remote visualization. ▪ Necessary energy requirement is being fulfilled by the battery mounted on the robot. The battery can be charged through the solar panel mounted on the robot or electrical supply.	
Next Generation Technology (NGT) for Forewarning Pest and Diseases	▪ An intelligent pest and disease forewarning system for Rice, Pigeon pea, and Grape using information and communication technology (ICT) and the Internet of things (IoT) is a promising system in the area of pest and disease forewarning. Aim is to increase farm productivity for better managing crops. ▪ Web portal forecasts the occurrence of pests and diseases using automated weather station (AWS) data and microclimatic parameters. ▪ Farmers will receive pest and disease forewarning information as well as effective crop management practices through electronic media such as SMS and mobile applications.	

'Out of box' initiatives

Partner AUs of CAAST have undertaken various out of box initiatives during the period such as innovative methods through adoption of horticultural crops in conservation agriculture, development of frozen dried ingredients, development of coconut and palm-based products, innovative technologies in livestock management etc. Below are some of the key initiatives undertaken by partner AUs of CAAST under this category.

Initiatives	Brief	Photograph
Horticultural crop cultivation under conservation agriculture by BCKV, West Bengal	▪ Partner AU have developed various conservation agriculture (CA) systems such as Arecanut based cropping system: Arecanut + Carrot-Mint-Kharif onion, Mango-Arecanut based cropping system: Mango + Arecanut + Frenchbean – Amaranthus - Kharif onion, Mango based cropping system: Mango + Guava + Berseem - Pumpkin etc. ▪ Partner AUs are also making efforts to promote such diversification in their vicinity through various field demonstrations and awareness programs for farmers.	 
Design and development of devices for the management of important reproductive disorders by IVRI, Izatnagar	▪ The 4 designs have been developed viz., Cyst ablation device, Cyst aspiration cum ablation device, Herd animal catcher and Internal genital injection device for efficient and economical management of reproductive disorders in bovine. ▪ These designs have been submitted for registration at the Indian Patent Office for Design.	 
Role of NLP transcription factors in nitrogen stress tolerance of rice by IARI, New Delhi	▪ The NIN-LIKE PROTEIN (NLP) family of transcription factors bind to nitrate-responsive cis-element (NRE)-and activate the nitrate-regulated expression of genes. In this, study genome-wide analysis of NLP gene family in rice was carried out. ▪ Analysis of genes for nitrate uptake, assimilation and signalling showed that high NUE rice genotypes have both high Nitrogen uptake efficiency (NUpE) and Nitrogen utilization efficiency (NUtE), resulting from the effective and coordinated signal transduction network involving the rice homologue of nitrate transceptor OsNRT1.1B, the probable primary nitrate response (PNR) regulator OsNLP1 and the master response regulator OsNLP3. ▪ Utilization of allelic variation in these genes will be useful to enhance NUE in rice.	 Gene regulation by nitrogen in plants. Transcriptional changes of genes analysed in the study are enclosed in dashed outlines.

Initiatives	Brief	Photograph
Coconut Research station (CRS) by KAU, Kerala	▪ Partner AU has been engaged in research and development of coconut and palm-based technologies under NAHEP. ▪ During the year, AU has developed CRS for carrying out the various research related activities in the areas of value addition, furniture making etc.	

c) Output-outcome monitoring

Sl.	Additional monitoring indicators	Baseline	Unit of measure	April'20 to March '21[1]	
				Plan	Achievement
1.	% increase in number of technologies commercialized	o	%	2	11
2.	% increase in faculty research effectiveness	21.2	h-index value	22.8	27
3.	Number of direct beneficiaries of the project	0	Number	-	118,394
4.	Number of female beneficiaries	0	Number	-	28,778
5.	% increase in JRF / SRF / ARS	13	%	14	22
6.	% increase in number of students who were admitted in foreign universities	10	%	11	11
7.	% increase in PG student placements	3	%	8	4
8.	Number of industry- sponsored projects and positions in cutting-edge areas of agri-science	32	Number	100	187
9.	Number of faculty training programmes (both national and international) undertaken by AU	0	Number	-	744
10.	Number of student training programmes (both national and international) undertaken by AU	0	Number	-	1,681

As mentioned in the table above, awarded CAAST projects have overachieved on indicators such **as faculty research effectiveness, number of industry sponsored projects and positions in cutting edge areas** (majorly in the areas of product testing, mobile based applications, FPO- industry linkages, developing prototypes etc.), **percent increase in JRF / SRF / students admitted in foreign universities.** As a worth mentioning achievement, the recently launched **Discovery Centre at ICAR-IARI** is an instrumental step towards enhancing the research effectiveness and scientific entrepreneurship in higher education. Under this component, different CoEs have been established on emerging areas of agriculture and allied sector to carry out the extensive research, develop the technologies, prepare the internationally competitive research articles and collaborate with industries to transfer and commercialize the technologies.

d) Input and activity monitoring

Input / Activity indicator	Sub- head / category	Apr'20 to March'21 Expenditure / input in INR lakhs	
		Planned	Utilization
Goods and equipment	Equipment, Plant & Machinery	1,860	1,458
	Office equipment	80	53
	Laboratory equipment	2,453	1,777
	Furniture & fixtures	143	121

1 Reported till March 2021

Input / Activity indicator	Sub- head / category	Apr'20 to March'21 Expenditure / input in INR lakhs	
		Planned	Utilization
	Computers and Peripherals	169	143
	Books and Journals	110	85
Civil works	Minor repair and renovation work	929	495
Human capacity building	National level training	38	6
	International level training	1,003	(5)
	Short visit/ seminars	127	13
	Meetings and workshops	68	17
Consultancy	National level consultancies	403	50
Recurrent cost / Miscellaneous	Travel	116	16
	Contractual services	2,291	1,298
	Operational costs	4,306	2,017
	Institutional charges	329	176
	Total	**14,424**	**7,723**

Out of planned **INR 144 Cr** expenditure across key input categories, utilization under CAAST component is **INR 77 Cr,** which signifies utilization percentage stood at **53%** for FY 2020-21. Specific expenditure heads like **national level consultancies, international level trainings and goods and equipment category,** require better planning and execution.

The holistic approach towards teaching and research for agriculture and rural development ingrained in this component, would be building capacities in a specialized thematic area and cutting-edge agricultural science and make AUs globally competitive and locally relevant. The investments under CAAST component have contributed towards enhancing the relevance of the teaching and research as envisaged in the project objective.

C. Component 1c (Innovation Grants)

Under this subcomponent, projects have been awarded to select participating AUs to attain accreditation. Reform ready AUs mentoring the non-accredited AUs is also part of this component. The Education Division, ICAR uses the voluntary accreditation process as a determinant of AU reform readiness. **Accreditation confirms that the given AU:**

a) has clearly defined and appropriate objectives (i.e., leadership);

b) has established an enabling environment that makes achievements of these objectives possible (i.e., governance);

c) is substantially accomplishing its objectives (i.e., effectiveness); and

d) is organized, staffed and supported to ensure its continuation (i.e., sustainability).

ICAR awards accreditation at three levels – university, college, and program – and bases its decision to accredit a given AU on three sources of evidence: (a) AU self-examination; (b) institutional peer review; and (c) final decision by the ICAR Accreditation Board. NAHEP supports AUs in their efforts to attain accreditation through this subcomponent.

a) Geographical distribution of partner AUs awarded under IG

Over the years of implementation, IG has awarded the sub-projects to 24[1] AUs spread across 14 states. Total budget outlay of the component is USD 30.8 Mn (INR ~198 Crores).

State/UT	Partner AUs	State/UT	Partner AUs
1. Andhra Pradesh	1. SVVU, Tirupati	**8. Madhya Pradesh**	10. NDVSU, Jabalpur
2. Bihar	2. BASU, Patna, 3. Dr. RPCAU, Pusa	**9. Maharashtra**	11. Dr. PDKV, Akola
3. Chhattisgarh	4. IGKV, Raipur, 5. CGKV, Durg	**10. Rajasthan**	12. SKRAU, Bikaner, 13. AU, Jodhpur, 14. AU Kota, 15. RAJUVAS, Bikaner
4. Gujarat	6. Kamdhenu University, Gandhinagar	**11. Telangana**	16. PVNRTVU, Hyderabad, 17. PJTSAU, Hyderabad, 18. SKLTSHU, Hyderabad
5. Haryana	7. MPHU, Karnal	**12. Uttarakhand**	19. VCSGUH&F, Bharsar, Uttarakhand
6. Karnataka	8. UAS, Raichur	**13. Uttar Pradesh**	20. ANDUA&T, Ayodhya, 21. RLBCAU, Jhansi, 22. SVPUA&T, Meerut
7. Kerala	9. KVASU, Wayanad	**14. West Bengal**	23. UBKV, West Bengal, 24. WBUA&FS, West Bengal

b) Key activities undertaken

During the implementation period, altogether 24 sub-projects under IG have been involved in carrying-out the activities under NAHEP. Due to social distancing restrictions imposed by various state governments, most of the capacity building programs were conducted through virtual mode. For strengthening the digital infrastructure partner AUs under IG have made significant efforts such development of e-course contents, online examination platform, virtual learning platform, e-content creation studio etc. Such digital embedded infrastructure has not only continued the academic activities but also widen the horizon of the learning avenues for students. Over and above, partner AUs have also taken initiatives like alumni engagement through virtual mode, organizing guest lecture series from industry experts, entrepreneurial activities, upgradation in existing scientific educational material, industry collaborations and student employment.

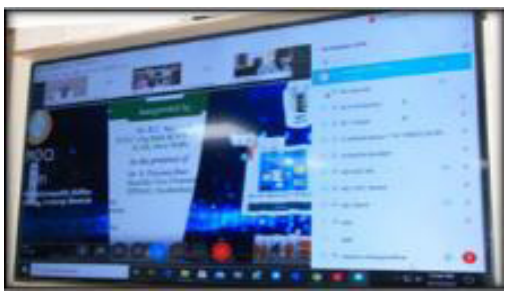
Strengthening of enabling infrastructures:

Over the last one year of implementation, various enabling infrastructures have been either developed or strengthened at partner AUs.

Initiatives	Brief	Photograph
Development of Smart Classroom by WBUAFS, Nadia	▪ Partner AU from IG has developed a training hall with a capacity of 50 seats and a smart classroom with a capacity of 30 seats.	
Establishment of Central Instrumental Laboratory (CIL) by VCSGUUHF, Bharsar	▪ It has developed a State of Art "NAHEP - Central Instrumental Laboratory (NAHEP-CIL)" with an aim to develop post-harvest processing and products of horticultural crops including medicinal and aromatic plants. ▪ With the help of CIL, AU has developed the processes / recipes for 12 products and have applied for 7 patents.	
Renewable Energy Fabrication Lab developed by PDKV, Akola	▪ During the period, partner AU has developed a renewable energy fabrication lab for providing hands-on training to the students. ▪ This facility with modern equipment is aimed to provide a better industry experience to the students.	

Digital interventions for enabling academic continuity

During the pandemic period, partner AUs from IG have been organizing training programs, classes and other academic activities through virtual mode. Most of the AUs have also initiated the online MOOC classes, virtual tutorials to avoid any disruption in academic activities. Some of the major initiatives by partner AUs of IG under this category are placed below.

Initiatives	Brief	Photograph
Virtual Macmillan English Campus established by SKRAU, Bikaner	▪ To improve the English language proficiency, partner AU has established a suitable facility with 3-year subscription of virtual courses by Macmillan English. ▪ A total of 200 students have been availing the benefits through these virtual classes.	
Development of Virtual Dissection of Ox/Cow by SVVU, Tirupati	▪ Partner AU has been consistently upgrading the Virtual Dissection tool for various species and animals. ▪ AU has recently developed the simulation modules for Anatomy and surgical procedures for Ox and Cow.	

c) Output-outcome monitoring

S. N.	Additional monitoring indicators	Baseline	Unit of measure	April'20 to March'21[7]	
				Plan	Achievement
1.	Number of AUs accredited with revised norms and standards of ICAR	55	Number	67	61
2.	Number of direct beneficiaries of the project	0	Number	-	43,861
3.	Number of female beneficiaries	0	Number	-	15,069
4.	Number of e- enabled learning activities initiated in AU (MOOC platform, virtual labs, video lectures	-	Number	28	129
5.	Number of trainings (national and international) undertaken for faculty upgradation	0	Number	-	329
6.	Centers for career development established	0	Number	2	5

As observed in the table above, awarded IG AUs have overachieved on indicators such as **e- enabled learning activities initiated, industry seminars and professional workshops from experts to better prepare students for final placements and establishment of Centers for Career development etc.**

There have been significant achievements in the number of AUs accreditation since project inception. Out of total all non-accredited AUs under the component, 7 AUs have received the accreditation after NAHEP implementation.

d) Input and activity monitoring

Input / Activity indicator	Sub- head / category	Apr'20 to March'21	
		Expenditure / input in INR lakhs	
		Planned	Utilization
Goods and equipment	Equipment, Plant & Machinery	-	-
	Office equipment	195	127
	Laboratory equipment	1,534	1,098
	Furniture & fixtures	154	132
	Computers and Peripherals	394	377
	Books and Journals	51	47
Civil works	Minor repair and renovation work	203	186
Human capacity building	National level training	106	46
	International level training	105	13
	Short visit/ seminars	184	69
	Meetings and workshops	124	23
Consultancy	National level consultancies	-	-

[7] Reported till March 2021

Input / Activity indicator	Sub- head / category	Apr'20 to March'21	
		Expenditure / input in INR lakhs	
		Planned	Utilization
Recurrent cost / Miscellaneous	Travel	129	23
	Contractual services	512	455
	Operational costs	852	658
	Institutional charges	86	68
	Total	**4,276**	**3,320**

Out of planned **INR 42 Cr** across key input expenditure categories, utilization under IG component is **INR 33 Cr.** While the utilization percentage stood at **78%** for FY 2020-21, additional efforts are to be made towards national level consultancies, international level trainings and goods and equipment category.

Innovation Grants is inclined towards assisting the AUs in developing a 'reforms ready' environment. These funds are used to encourage both faculty and students toward collaborative improvements at their AU and finance support to students' learning to attain accreditation.

II. Component 2 (Investments in ICAR for Leadership in Agricultural Higher Education)

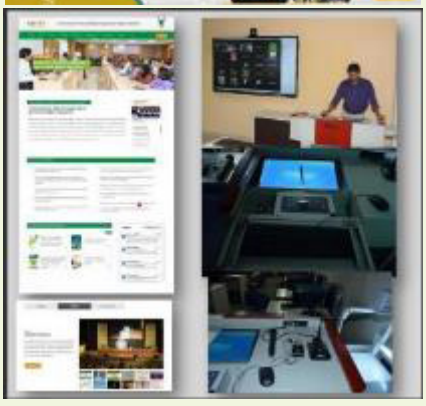
ICAR-NAHEP responsibility for national coordination and quality assurance of agricultural higher education requires leveraging on its comparative advantage in assessing systematic challenges across the ICAR-AU System and nurturing solutions. Keeping the same responsibility in mind, the Component 2 includes investments to finance the institutional reforms within ICAR. These reforms would enhance ICAR's effectiveness in coordinating, guiding and managing agricultural higher education and its interactions with AUs and key stakeholders nationwide through interventions that increase the quality and relevance of agricultural higher education. The Total budget outlay of this component is **USD 10.4 Mn (INR ~66Crores).**

a) Key activities undertaken

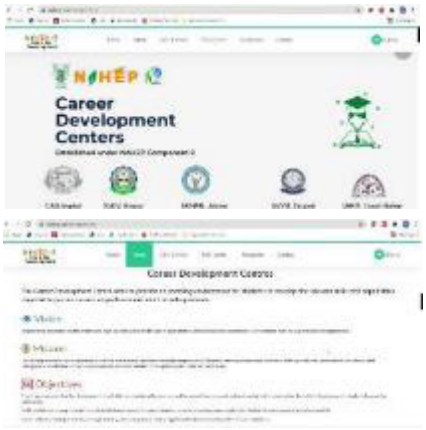
Strengthening of necessary Digital infrastructures by ICAR- IASRI:

There have been significant developments during last year under this component including strengthening the digital infrastructure of ICAR – AU system, which will ultimately bring out institutional reforms.

In order to strengthen the services and infrastructure needs of digital agriculture in National Agricultural Research and Education System (NARES), the existing Data Centre (ICAR-DC) built during 2012 is being strengthened with cloud computing infrastructure. Under NAHEP, the outreach of existing ICAR Data Center (DC) has been broadened to cover the agriculture universities enabling them to host their websites and IT solutions.

Initiatives	Brief	Photograph
Establishment of Disaster Recovery Centre (DRC) at ICAR-NAARM, Hyderabad	▪ To ensure future readiness, and to mitigate the risk of fire, terrorist attacks, and natural calamities, the ICT infrastructure of ICAR AU system is being strengthened by establishing the Disaster Recovery Centre (DRC) at NAARM Hyderabad. ▪ ICAR-DC and ICAR-DRC will be synchronized with each other and will also have technologies to build ICAR - Cloud with capabilities to support Artificial Intelligence (AI) and Video Streaming applications along with the existing web and Mobile Apps. ▪ Network integration between the ICAR-DRC, NAARM, Hyderabad and ICAR-DC, ICAR-IASRI will provide seamless access to the application services running on these centers to the users.	 
Establishment of Virtual Classrooms & AgriDIKSHA Web Education Channel	▪ 18 integrated Virtual classrooms at AUs have been established with state-of-the-art equipment to capture videos of classes, broadcast, video editing and AI search capabilities. The facility allows students to access high-quality recordings of lectures anytime and anywhere. It is an inclusive solution that enable aggregation and dissemination of content through AgriDiksha platform. ▪ The virtual classroom is a technology-enhanced classroom that makes lectures and assessments easier, engaging and more interactive. It fosters connectivity, creativity and innovative ideas leading to better questions and solutions.	 

Establishment of Facilitative Centres by ICAR-NAARM:

Initiatives	Brief	Photograph
Career Development Centers:	▪ The Academy has established **5 Career Development Centres at five Agricultural Universities** for empowering and enriching the student's professional skills to cope up with global challenges in the agriculture & allied sector. ▪ CDCs are expected to create a student-centric career development platform to achieve professional excellence through comprehensive career counselling, innovative educational programming, promotion of agri entrepreneurial skills for better employability. ▪ The Universities where CDCs have been established are **CAU Imphal, IGKV Raipur, SKNAU Jobner, SVVU Tirupati and UBKV Cooch Bihar.**	
Network of Inspired Teachers	▪ The network of inspired teachers has been developed with the help of this component. The database of Best Teacher awardees and popular teachers (~600) among students were collected and built from 30 Universities.	

b) Output-outcome monitoring

S. N.	Additional monitoring indicators	Baseline	Unit of measure	April'20 to March'21[1]	
				Plan	Achievement
1.	Number of MOUs signed between industry / HEIs and AUs to strengthen their linkages	6	Number	11	14
2.	Number of e- enabled learning activities initiated in AU (MOOC platform, virtual labs, video lectures)	-	Number	-	17
3.	Number of IDP/CAAST /IG proposals assisted by education division	0	Number	-	58
4.	No. of AUs in which Academic Management System implemented	0	Number	-	53
5.	Number of External advisory panel visits to AU for capacity building	0	Number	3	1
6.	Number of workshops / seminars conducted with representatives of State governments to catalyze their participation in raising the quality and relevance of agricultural higher education)	0	Number	4	7
7.	Number of direct beneficiaries of the project	0	Number	-	7,445

[8]Reported till March 2021; Plan for few indicators have been captured from NITI OOF targets for FY20-21 of NAHEP

As mentioned above, awarded institutes under Component 2 have overachieved on indicator**: number of MOUs signed between industry / HEIs and AUs to strengthen their linkages, development of e-enabled learning activities initiated in AUs, workshops conducted with government representatives etc.** Component 2 institutes need to strategize further in meeting the planned targets against the **external advisory panel visits to AU for capacity building.**

c) Input and activity monitoring

Input / Activity indicator	Sub- head / category	Apr'19 to March'20	
		Expenditure / input in INR lakhs	
		Planned	Utilized
Goods and equipment	Equipment, Plant & Machinery	500	1,052
	Office equipment	-	-
	Laboratory equipment	203	419
	Furniture & fixtures	40	-
	Computers and Peripherals	-	49
	Books and Journals	-	-
Civil works	Minor repair and renovation work	5	-
Human capacity building	National level training	15	0
	International level training	10	-
	Short visit/ seminars	534	-
	Meetings and workshops	110	-
Consultancy	National level consultancies	282	245
Recurrent cost / Miscellaneous	Travel	178	7
	Contractual services	221	219
	Operational costs	703	160
	Institutional charges	96	3
	Total	**2,896**	**2,157**

Over last year, project fund utilization has improved significantly as **out of total INR 28.9 Crores,** utilization under this component is **74% i.e., INR 21.2 Crores**. The investment under this component intends to strengthen ICAR's governance and management of the Agricultural Higher Education in the country through supporting institutional reforms.

This component will enable ICAR to be better equipped in effective coordination, guidance and management of the agricultural higher education in India. Through appropriate interventions, the ICAR will improve its interactions with AUs and other stakeholders, which will further lead to enhanced quality and relevance of agricultural higher education in the ICAR-SAU system.

III. Component 3 (Project Management and Learning):

Component 3 aims at strengthening ICAR's management capacity for project implementation. The key activities under this component are:

- The Maintenance of Project Implementation Unit and Monitoring and Evaluation Cell to ensure:
  - o Compliance with the project's procurement, financial management, and reporting requirements.
  - o Carrying out administration, supervision, monitoring and evaluation of project awarded under IDP, CAAST and IG;
- The provision of training to ICAR and participating AUs to achieve and sustain increased quality, relevance, and effectiveness of agricultural higher education.
- The dissemination and communication of project interventions and outcomes.

The activities under this component are crucial for cost effective implementation and achievement of project outcomes efficiently.

a) Monitoring and Evaluation

The major activities and achievements under Monitoring and Learning component includes M&E initiation activities, baseline finalization activities, and PMTS and PME related activities. During the year, M&E team has taken various initiatives for effective monitoring of the project and plan for evaluation.

1. NAHEP: Assessing the performance of awarded AUs on an analytical scoring framework

As an important suggestion made during the **WB Midterm review meeting held in Sept'20,** the strategic interventions at AU and PIU level are required to address the key challenges existing across the key functional areas of NAHEP in such a way that the physical progress corresponds to the financial utilization, and this will ultimately ensure the effective implementation of NAHEP. Prior developing interventions, it is imperative to assess the **Call specific - component specific - AU specific** performance made till date in an objective manner.

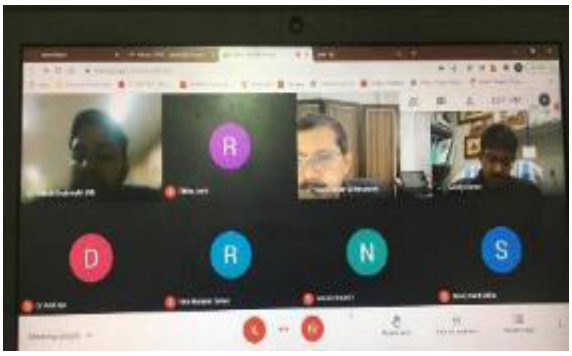
To address these issues, central M&E team has taken an initiative to assess the implementation performance of NAHEP awarded AUs on an analytical scoring framework. Based on findings of assessment, component wise AUs have been classified into 3 categories: Strength, Competent and needs improvement. The performance score board developed by M&E team provides a comprehensive view of overall progress of AUs in such a manner that physical progress suitably corresponds to financial progress. **Through this initiative, major objective is to create a competitive spirit among grants and to advise them for necessary corrections, required if any.**

The score board has been developed on the basis of the following assumptions.

Functionality	Assumption
Financial Management	▪ Performance of each AU has been measured on the basis of % fund utilization, (out of release) and comparative assessment has been made with the highest utilization from respective component. ▪ On the basis of comparison of fund utilization, score has been assigned as per the percentile score scale. Percentile Score Scale: Less than 60 percentile - 6, 60 to 90 percentile - 8 and more than 90 percentile -10
Procurement Management	▪ On the similar lines of financial management, procurement performance of each AU has been measured on the basis of Signed / Completed Contracts and comparative assessment has been made with the AU with highest signed/ completed procurement from respective component. Percentile Score Scale: Less than 60 percentile - 6, 60 to 90 percentile - 8 and more than 90 percentile - 10
Output-Outcome Monitoring	▪ Performance of each AU has been measured on achievements against component specific M&E indicators. A comparative assessment has been made with the overall performance of component against each M&E indicator assigned. ▪ In case, where AU has not responded to a specific indicator, the score has been considered "0". If AU has responded but achievement is less than average, the score has been considered as "0.5" whereas if AU has secured greater than respective component's average, the score has been considered as "1"

Under this initiative, Central M&E team has been updating the scoreboard on quarterly basis wherein the **AUIPS 1.0 was updated & published in December 2020.** To expedite the technical progress while aligning it with financial achievements for those call 1 and call 2 awarded AUs who have fallen under the "Needs improvement" and a few from "Competent" categories during AUIPS 1.0, Central M&E organized M&E Clinics for 15 select AUs from 5th to 18th February 2021.

Glimpse of M&E Clinic organized during February 2021



Based on the efforts made during M&E clinics and further handholding sessions for the targeted 15 partner AUs, AUIPS 2.0 outcomes of these AUs improved significantly. These results were discussed with all the partner AUs during **NAHEP Technical Review-2021 held in June 2021** and expectations were put forth to improve the overall implementation performance further.

AU Implementation performance Score Board 2.0 vs. 1.0

Award Call	Name of the AU	AUIPS 2.0 (Post M&E clinzics)					AUIPS 1.0 (Dec'20)	
		FM (Max: 4)	PM (Max: 1)	OOM (Max: 5)	Final Score (Max: 10)	Rating	Final Score	Rating
IDP								
I	JAU, Junagadh	4.0	1.0	3.8	8.8	Strength	7.9	Strength
I	NDRI, Karnal	4.0	1.0	2.7	7.7	Strength	6.5	Competent
I	OUAT, Bhubaneshwar	3.2	1.0	3.3	7.5	Strength	6.3	Competent
I	CCSHAU, Hisar	3.2	0.8	2.5	6.5	Competent	5.7	Competent
I	TANUVAS, Chennai	4.0	1.0	0.8	5.8	Competent	6.5	Competent
I	ANGRAU, Guntur	4.0	1.0	0.8	5.8	Competent	7.5	Strength
I	AAU, Jorhat	4.0	1.0	0.8	5.8	Competent	6.7	Competent
I	MPUAT, Udaipur	3.2	1.0	1.5	5.7	Competent	5.1	Competent
II	UAS, Dharwad	4.0	0.8	3.1	7.9	Strength	6.3	Competent
II	SKUAST, Kashmir	4.0	0.8	2.7	7.5	Strength	5.9	Competent
II	TNAU, Coimbatore	4.0	1.0	2.1	7.1	Competent	6.7	Competent
II	GADVASU, Ludhiana	3.2	1.0	2.5	6.7	Competent	5.1	Competent
II	GBPUAT, Pantnagar	3.2	1.0	1.0	5.2	Competent	7.3	Competent
CAAST								
I	NAU, Navsari	3.2	1.0	3.1	7.3	Competent	3.0	Needs Improvement

Award Call	Name of the AU	AUIPS 2.0 (Post M&E clinzics)					AUIPS 1.0 (Dec'20)	
		FM (Max: 4)	PM (Max: 1)	OOM (Max: 5)	Final Score (Max: 10)	Rating	Final Score	Rating
I	CSAU&T, Kanpur	3.2	0.6	3.1	6.9	Competent	4.3	Needs Improvement
I	CIFE, Mumbai	4.0	1.0	1.9	6.9	Competent	5.4	Competent
I	MPKV, Rahuri	4.0	1.0	0.6	5.6	Competent	7.1	Competent
I	UAS, Bangalore	4.0	1.0	0.6	5.6	Competent	5.9	Competent
I	PAU, Ludhiana	4.0	1.0	0.0	5.0	Competent	8.1	Strength
I	BCKV, West Bengal	4.0	1.0	0.0	5.0	Competent	4.0	Needs Improvement
I	IARI, New Delhi	4.0	1.0	0.0	5.0	Competent	4.8	Needs Improvement
I	IVRI, Izatnagar	3.2	0.6	0.0	3.8	Needs Improvement	3.9	Needs Improvement
II	BAU, Ranchi	3.2	1.0	2.5	6.7	Competent	4.1	Needs Improvement
II	CSK HPKV, Palampur	2.4	1.0	2.8	6.2	Competent	4.9	Needs Improvement
II	AAU, Anand	3.2	1.0	1.9	6.1	Competent	6.6	Competent
II	KAU, KERALA	2.4	1.0	2.5	5.9	Competent	6.3	Competent
II	VNMKV, Parbhani	2.4	1.0	2.5	5.9	Competent	5.8	Competent
IG								
I	SKRAU, Bikaner	4.0	1.0	5.0	10.0	Strength	5.3	Competent
I	PDKV, Akola	4.0	1.0	3.8	8.8	Strength	7.1	Competent
I	BASU, Patna	3.2	1.0	3.8	8.0	Strength	9.2	Strength
I	Kamdhenu, Gandhinagar	4.0	1.0	2.5	7.5	Strength	8.6	Strength
I	PVNRTVU, Hyderabad	4.0	1.0	2.5	7.5	Strength	3.8	Needs Improvement
I	PJTSAU, Hyderabad	4.0	0.8	2.1	6.9	Competent	5.2	Competent
I	SVVU, Tirupati	4.0	1.0	1.7	6.7	Competent	7.4	Competent
I	MPHU, Karnal	2.4	1.0	2.9	6.3	Competent	3.6	Needs Improvement
I	AU-Kota	4.0	1.0	0.0	5.0	Competent	5.5	Competent
I	AU, Jodhpur	4.0	1.0	0.0	5.0	Competent	4.0	Needs Improvement
II	RLBCAU, Jhansi	4.0	1.0	4.6	9.6	Strength	8.7	Strength
II	SKLTSHU-Telangana	4.0	1.0	2.5	7.5	Strength	6.3	Competent
II	UAS, Raichur, Karnataka	4.0	0.8	2.5	7.3	Competent	7.0	Competent
II	WBUAFS, West Bengal	3.2	1.0	2.5	6.7	Competent	5.9	Competent
II	ANDUA&T-UP	4.0	1.0	1.7	6.7	Competent	4.5	Needs Improvement
II	UBKV-WB	2.4	1.0	2.5	5.9	Competent	3.7	Needs Improvement
II	Dr. RPCAU, Bihar	3.2	1.0	1.7	5.9	Competent	3.9	Needs Improvement

It depicts that 9 partner AUs from IDP whereas 8 AUs from CAAST and 13 AUs from IG have improved their performance category & score significantly during AUIPS 2.0 in comparison to AUIPS 1.0 due to timely handholding extended through M&E Clinics and other M&E handholding sessions.

In order to keep up the momentum of improving the individual performances along with competitive spirits among partner AUs, M&E team will regularly update & publish the AUIPS scoreboard, preferably on quarterly basis.

2. Assessment of students' and faculties' satisfaction

Central M&E team has taken an initiative to assess one of the important IR indicators '**Student & Faculty Satisfaction with quality assurance role of Education Division'** through organizing a detailed survey in virtual mode. The key parameters considered to assess the students' satisfaction level were industry orientation & professional skill development, training & capacity building initiatives and facilities & infrastructure whereas faculty satisfaction level were assessed on following parameters: training and capacity building, Facilities and infrastructure, Collaboration and linkages etc.

Here are details of each parameter which was further analyzed to assess the satisfaction level of faculty and student.

Category	Survey queries
Parameters considered for assessment of student satisfaction	
Industry orientation & professional skill development	Entrepreneurship development program
	Leadership development programs
	Industry oriented exposure visits
	Improved awareness on guidance provided on Career Opportunities in agriculture and allied sector by your AU faculties
	Industry collaborations made by your AU under NAHEP
	Pilot courses on emerging areas of the agriculture and allied course
	Industry seminars and professional workshops from experts
	Internship and experiential learning programs
	Communication skill development program
Other training & capacity building initiatives	Guest lectures by national/ international faculties
	Agriculture Education Fair organised by your AU under NAHEP
	International training programs
	Sandwich program with national/ international organization
Facilities & infrastructure	Alumni cell established by your AU
	Designated placement cell established placement related activities
	Capability for in- house or lateral placements/ jobs
	Benefitted from establishment of virtual/ smart classroom
	Facilities to learn through online classes- MOOC
	Benefitted from Next generation infrastructures and equipment
Parameters considered for assessment of faculty satisfaction	
Training and capacity building	Faculty development program at national level
	Faculty development program at international level
	Subject-matter specialized CB programs
Facilities and infrastructure	Infrastructure - Libraries / laboratories/ facilitative units established under NAHEP to improve the research effectiveness
	Establishment of management information system (MIS) under NAHEP
	Availability of advanced teaching aids (virtual / smart classrooms / seminar / conference halls) established under NAHEP

Category	Survey queries
Collaboration and linkages	Improved MoU opportunities with industry for tech transfer and commercialization
	Improved awareness on global / national research collaboration & competitive grant opportunities
Training and capacity building	Faculty development program at national level
	Faculty development program at international level
	Subject-matter specialized CB programs

During the year, **5,203** students have responded to the satisfaction survey, wherein 3,985 (~76%) students were aware about the NAHEP project. Out of 1,691 respondent faculties, 1,527 (~90%) faculties were aware about the project. Students and faculties who were aware about the NAHEP were further assessed on the aforementioned survey queries.

Placed below are the key findings of assessment of student and faculty satisfaction survey.

Assessment of student satisfaction				
Satisfaction assessment category	**Weightage**	**Average satisfaction score**	**Max score**	**Weighted satisfaction score**
Industry orientation and professional skill development	45%	**2.27**	3.00	1.02
Training and capacity building	25%	**2.24**	3.00	0.56
Facilities and infrastructure	30%	**2.28**	3.00	0.68
Overall			**3.00**	**2.26**

Assessment of faculty satisfaction				
Satisfaction assessment category	**Weightage**	**Average satisfaction score**	**Max score**	**Weighted satisfaction score**
Training and capacity building	40%	**2.50**	3.00	1.00
Facilities and infrastructure	30%	**2.57**	3.00	0.77
Industry collaboration and global experience	30%	**2.45**	3.00	0.74
Overall			**3.00**	**2.51**

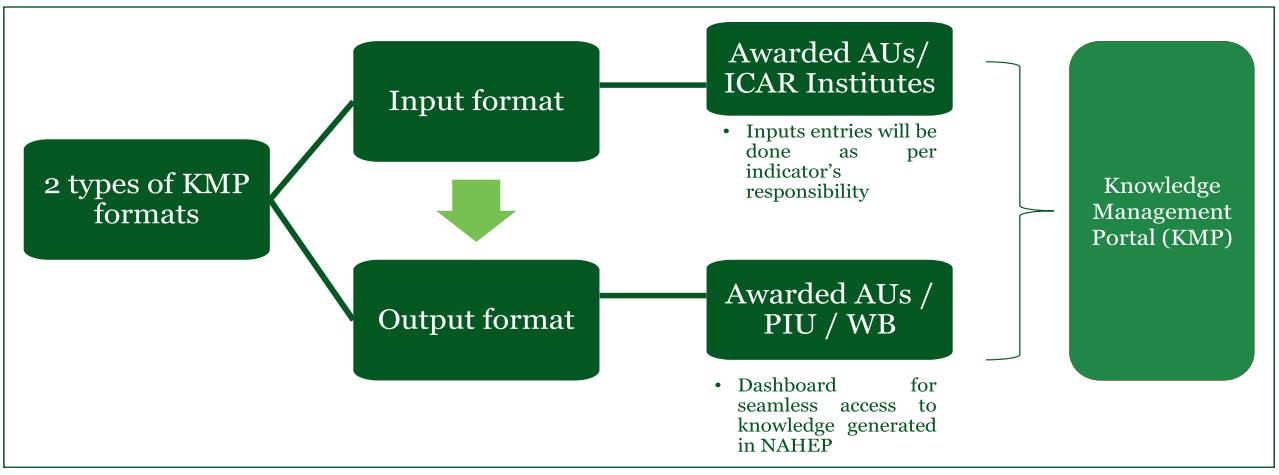
*The table depicts that students and faculties are moderate to highly satisfied at overall level due to the direct & perceived benefits of the program. However, a clear distinction of efforts leading to PDO needs to be established in few areas between ICAR- AED and NAHEP, the same will be better mapped through control sampling (**AUs without NAHEP intervention, Colleges under partner AUs where NAHEP funding / impact leverage is minimum**) and counterfactual analysis (Difference -in- difference).*

3. Knowledge Management initiative – Development and implementation of KMF and KMP

Development of Knowledge Management Framework (KMF): For an effective implementation of Knowledge management strategy in NAHEP, there is need to develop a robust Knowledge management framework (KMF). KMF comprises of measurable indices, reporting frequency and responsible agency / partner to report the indices. KMF will form the base for development of Knowledge management portal. KM indices have been developed in such a way that these indices could be useful in M&E related decision making. Performance of awarded AUs against KM indices can also be synced with AU Implementation Performance Scoreboard (AUIPS), if required to make the performance assessment against outcome indices more comprehensive and rational.

#	Measurable KM indices	Frequency	Responsible agency to report
1	Knowledge collaterals		
	• Research Articles / publications – Uploads	Quarterly	Partner AUs / PIU
	• Books /Annual Reports– Uploads	Quarterly	Partner AUs / PIU
	• Media outreach / Success stories / Newsletter - Uploads	Quarterly	Partner AUs / PIU
	• Magazines - Uploads	Quarterly	Partner AUs / PIU
	• Blogs- Uploads	Quarterly	Partner AUs / PIU
	• Research Articles / publications – Views and downloads	Monthly	IASRI
	• Books /Annual Reports– Views and downloads	Monthly	IASRI
	• Media outreach / Success stories / Newsletter - Views and downloads	Monthly	IASRI
	• Magazines - Views and downloads	Monthly	IASRI
	• Blogs- Views and downloads	Monthly	IASRI
2	Mobile and web applications		
	• Mobile applications developed and link to install uploaded on KMP	Semi annual	Partner AUs / PIU
	• Web applications developed	Semi annual	Partner AUs / PIU
	• Mobile applications downloaded (No. of apps*times downloaded)	Quarterly	IASRI
	• Web applications (No. of page views)	Quarterly	IASRI
3	Number of IPR registered / obtained *(with upload option)*	Quarterly	Partner AUs / PIU
4	Dissemination and outreach		
	• Number of posts / column in newspaper / magazines / social media platforms	Monthly	Partner AUs / PIU
	• Number of unique promotional or outreach collaterals / PoPs / e-flyers of NAHEP developed & disseminated (both physical & virtual)	Monthly	Partner AUs / PIU

Development and launch of Knowledge Management Portal (KMP): Knowledge management portal (KMP) is a web-based application / page to provide the automated solution to users. Every respondent has his/her own user credentials to login into the system to interact with the system. In case of NAHEP, the key functionalities of KMP will be to store data on server side of all the respondents, timely input entry against measurable KM indices, alerts and reminders, Dashboard for seamless access to knowledge generated in NAHEP in a centralized manner and generate the various reports for decision-making levels.



Timely input entries will be made by partner AUs based on reporting frequency in input formats, whereas there will be a standardized output in the form of a dashboard for all the key stakeholders (Partner AUs / PIU / WB) for seamless access to knowledge generated in NAHEP. Dashboard / output format will be dynamic in nature and will be updated on the basis of input entries.

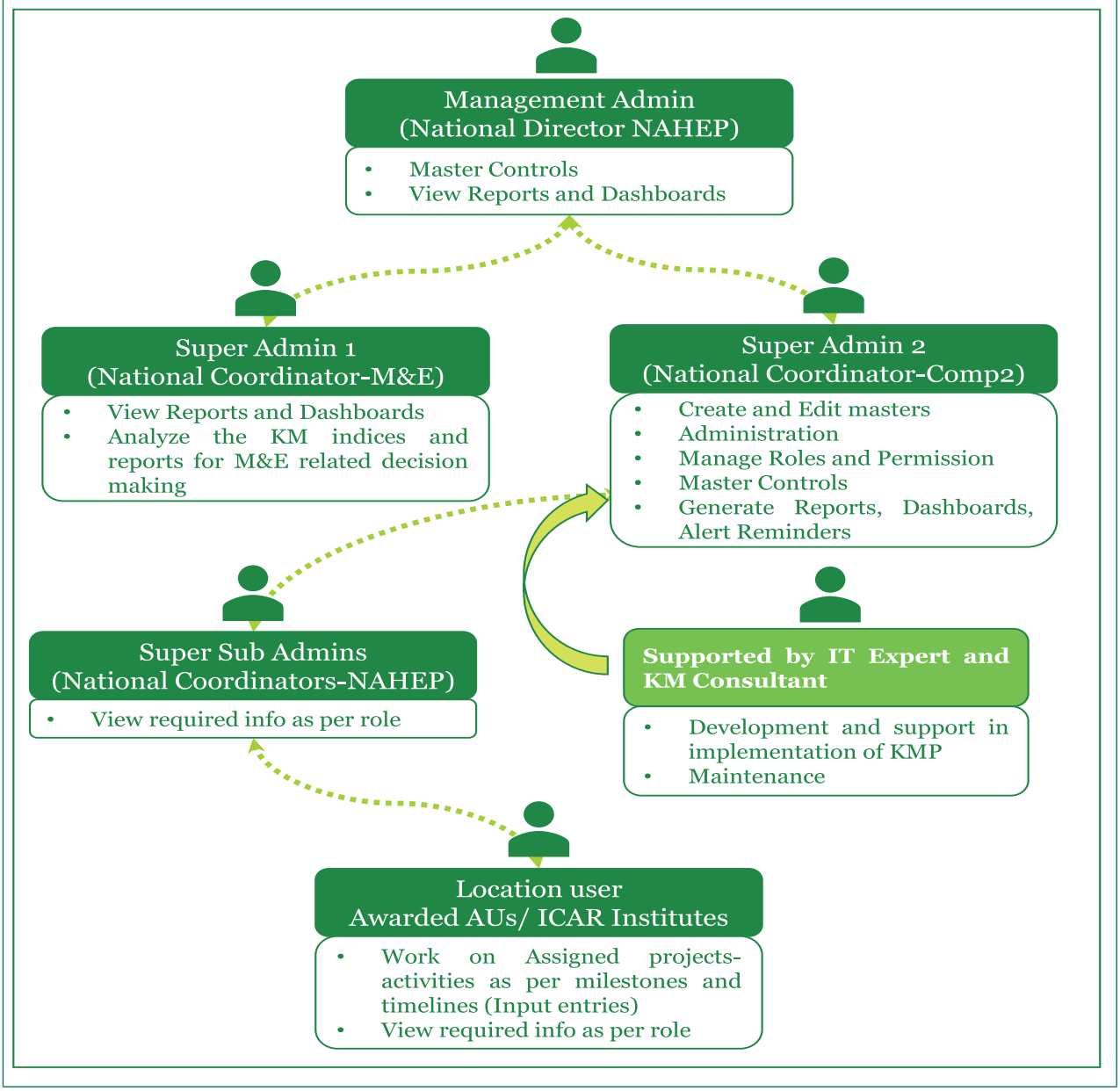
Initiation of KM activities at AUs: Considering the NAHEP requirement, it is important that participating Agricultural Universities (AUs)/ ICAR Institutes get ready with the following preparatory exercises to facilitate KMP activities of NAHEP:

a. Assign a nodal officer to spearhead the KM cell, to manage KM activities of assigned project (of respective component) and work in tandem with concerned resource at PIU

b. Sensitize the project team and other AU faculties/staffs on KM framework and portal

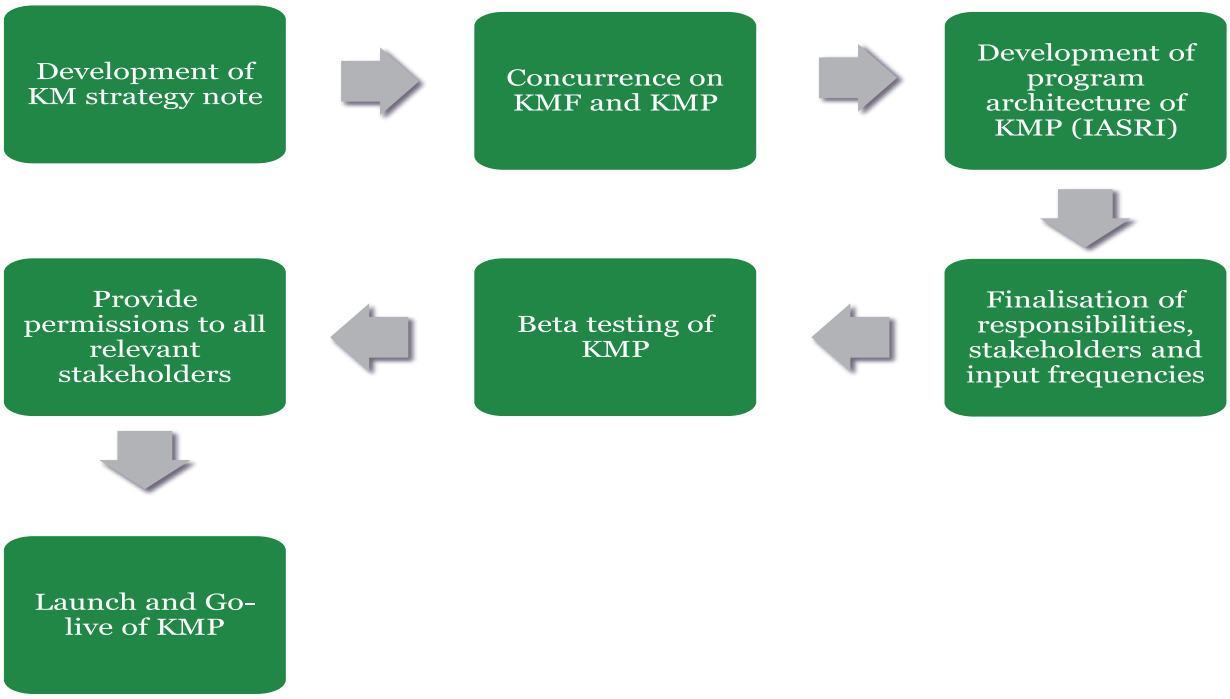
c. Develop the KM strategy **(ensure timely and accurate input entries)** at AU level for effective implementation

Exhibit: KMP users and their broad functions on interface

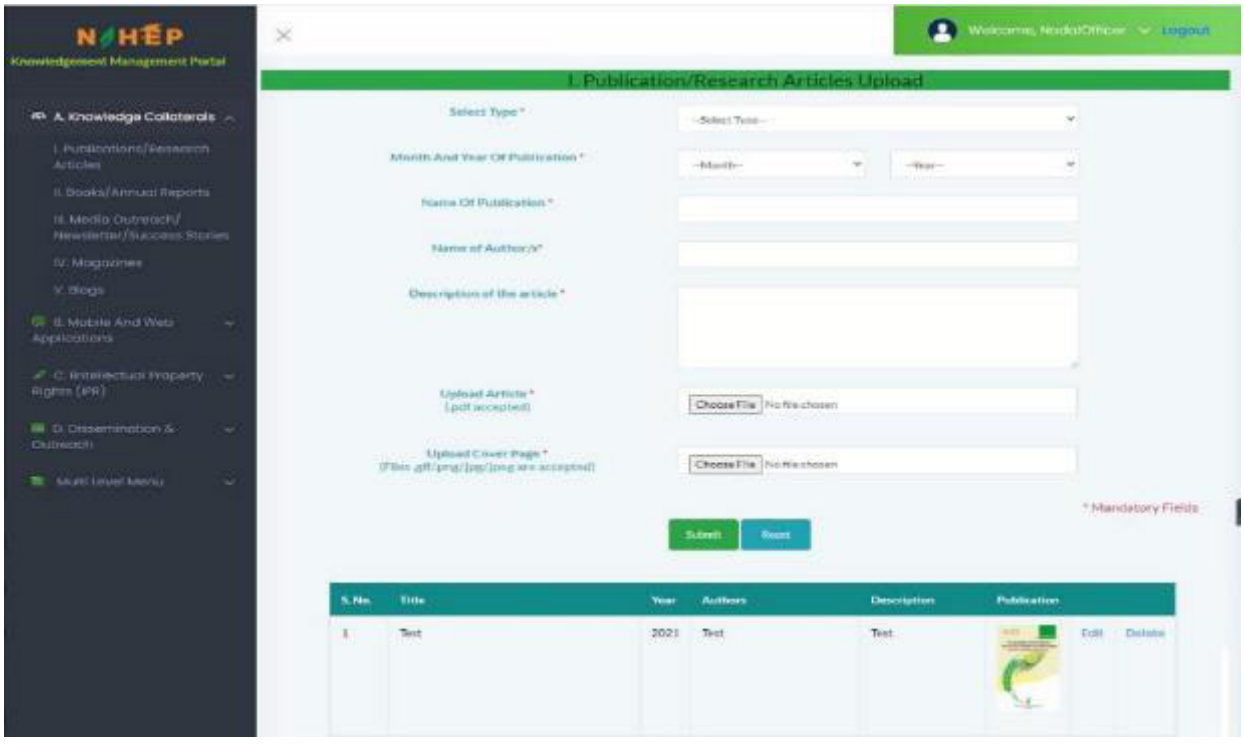


KM implementation arrangement in NAHEP: Following are the key steps involved in implementation of Knowledge management framework and portal in NAHEP;

Exhibit: Key steps involved in KM Implementation in NAHEP



Dashboard view of Knowledge management portal (KMP) of NAHEP



The achievements against outcome indicators leading to NAHEP PDO such as **increased student placement rates, increased faculty research effectiveness, improved revenue generation, reduced faculty and student inbreeding etc**. is very well evident and have been presented in report.

These achievement figures confirm that activities at partner AUs are attributing to RF indicators and NAHEP PDO and therefore leading to the increased quality and relevance of agricultural higher education.

b) Procurement management

Procurement policies and procedures of the World Bank as outlined in the Procurement Guidelines and

Consultant Guidelines is applicable for NAHEP. It is mandatory that all procurement activities to be carried out under the project by any IA/IP, prior to being procured, are included in the procurement plan which shall be subject to Bank review and prior clearance.

Procurement Plan — STEP: Procurement Plan is a starting point of Procurement in a project. STEP (Systematic Tracking of Exchanges in Procurement) is an online system to help the World Bank and borrowers plan and track procurement activities under Bank-financed projects. STEP enables auto publication of approved procurement plan, publication notices and contract award information in the Bank's external website, UNDB online, World Bank Finances App, and World Bank Procurement App. Participating AUs shall prepare a procurement plan based on the projected activities in the Project Implementation Plan and submit it to PIU for their review and acceptance through STEP. Upon vetting by PIU this shall be sent to WB through STEP (tracking system) for Bank review and online clearance. Procurement activities to be updated in STEP duly uploading Procurement Documents.

Guiding Principles of Procurement: Mandatory Compliance with:

- Loan Agreement between the Borrower & WB
- WB Procurement Guidelines:

  "Procurement Guidelines" for Procurement of Goods, Works and Non-Consultant Services

  "Selection and Employment of Consultants"
- Department SOP (schedule of power)

Threshold Limits for procurement

Category	Method of Procurement	Threshold (USD Equivalent)	Prior review threshold
Goods and Non- consulting services	ICB	>3,000,000	All Direct contracts above USD 10,000 and all other contracts equal to or greater than USD 1 million equivalent;
	LIB	wherever agreed by Bank	
	NCB	Up to 3,000,000 (with NCB conditions)	
	Shopping	Up to 100,000	
	DC	As per para 3.7 of Guidelines	
	Force Account	As per para 3.9 of Guidelines	
	Framework Agreements	As per para 3.6 of Guidelines	
	Community Participation	As per para 3.19 of Guidelines	
Works	ICB	>40,000,000	All Direct contracts above USD 10,000 and all other contracts equal to or greater than USD 10 million equivalent
	NCB	Up to 40,000,000	
	Shopping	Up to 100,000	
	DC	As per para 3.7 of Guidelines	
	Force Account	As per para 3.9 of Guidelines	
	Community Participation	As per para. 3.19 of Guidelines	
Consultants' Services	CQS/LCS	Up to 300,000	All Single source selection contracts above USD 10000 and all other contracts equal to or greater than USD 500,000 equivalent for firms; and equal to or greater than USD 200,000 equivalent for individuals
	SSS	As per para 3.9-3.11 of Guidelines	
	Individuals	As per Section V of Guidelines	
	QCBS/QBS/FBS	for all other cases	
	(i) International shortlist (ii) Shortlist may comprise national consultants only	>800,000 Up to 800,000	
Source: Procurement manual, NAHEP			

Procurement Methods under NAHEP (for Goods/Works):

International Competitive Bidding (ICB)

ICB is the most efficient/ economic and preferred method of procurement to be adopted, where import of goods or likely participation of foreign firm is involved. Must for all contracts above US$ 30,00,000. or items sourced from abroad. Publication in U N Development Business online (UNDB online) /World Bank – Automatically published through STEP when uploaded. Advertisement in at least one News Paper of National Circulation. - publication on client's web site shall also be done. Use of Standard Bidding Documents, Bid evaluation and Award of contract.

National Competitive Bidding (NCB)

For Contracts Up to US$ 3,000,000. Used where foreign competition unlikely. Advertisement in at least one News Paper of National Circulation. - publication on client's web site shall also be done. All other as in ICB

Shopping (National & International)

- For small amount of off-the shelf goods or standardized goods
- Applicable for contracts Up to 1,00,000
- Covers procurement of most of the items under NAHEP
- Simple, rapid and least competitive procurement
- Requires minimum 3 quotations.
- For international shopping minimum 3 quotations are required from 2 different countries
- GeM is allowed in lieu of shopping up to US$ 100,000, provided there are at least three (3) suppliers for the item on GeM and the purchaser uses RFQ feature

Direct Contracting

Contracting without competition (single source). Appropriate under following circumstances:

- extension of existing contract for goods/works
- additional purchases from original Supplier
- proprietary equipment
- natural disasters

Publish contract in *UNDB*: Done automatically when uploaded in STEP

Methods and Value thresholds for Consultancy Services

i. **Quality and Cost based Selection (QCBS): -**

   1. QCBS is a method of selection through competition among qualified shortlisted firms based on the quality of the proposals and the cost of the services provided. It is the most commonly recommended method for selection of consultant for most types of services.

ii. **Other methods of selecting a consultant includes:**

   a) Quality Based Selection (QBS),

   b) Fixed Budget (FBS),

   c) Least Cost Selection (LCS),

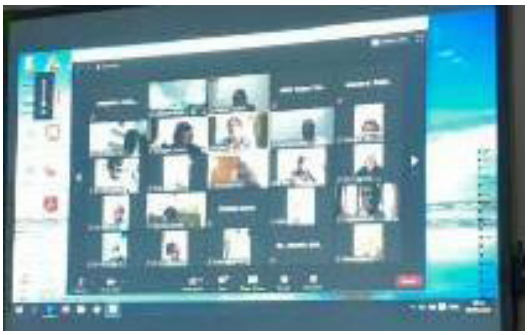
   d) Consultant's Qualifications (CQS)

   e) Single Source Selection (SSS): Single-source selection of consultants does not provide the benefits of competition in regard to quality and cost, lacks transparency in selection Therefore, single-source selection shall be used only in exceptional cases.

iii. **Selection of Individual Consultants**

Consultants shall be selected through comparison of qualifications of at least three candidates among those who have expressed interest in the assignment in response to advertisement or have been approached directly by the Client.

Central procurement team has made significant efforts during the FY2020-21 to improve the procurement progress for ensuring effective implementation at AU level. More than **45 one to one procurement reviews** have been concluded under the chairmanship of National Director during the year.

Capacity building activities carried-out by procurement team	
	Workshop: Training-cum-hand holding workshop for the awarded AUs organised during August 2020 to January 2021

NAHEP procurement progress (Figures in 000′ USD) till March 2021 (Cumulative)

Process status-STEP	Consultancy services	Goods	Works	Non-consultancy	Total	% completion
Pending implementation	184	2,722	429	31	3,366	7%
Under Implementation	435	4,813	1,194	60	6,502	13%
Signed contracts	2,619	8,325	1,464	0	12,408	25%
Completed	206	22,757	3,826	2	26,791	55%
Total	3444	38617	6913	93	49,067	**100%**

As observed in the table above, contribution of signed and completed contracts together constitute significant progress over last year i.e., **80%** of total procurement made under different components of NAHEP.

c) Financial management

The fund utilization of NAHEP has been closely monitored by PIU-NAHEP under the guidance of National Director. PIU-NAHEP has organized **need-based capacity building activities and review meetings for awarded AUs to expedite the fund utilization**. The cumulative financial utilization progress of the project till March 2021 has been tabulated below:

Particulars	INR (lakhs)				
	2017-18	2018-19	2019-20	2020-21	Total
A. Funds released by NAHEP to participating AUs	-	20,657	24,137	18,000	**59,574**
B. Fund utilization by participating AUs	-	7,526	15,663	16,975	40,164
% Total utilization	-	**36%**	**65%**	**94%**	**67%**

There has been significant increase in the utilization of budget by awarded AUs, as compared to last WB Mid-term review held in September 2020. The cumulative fund utilization for NAHEP has reached at 67%.

Component-wise financial progress status *(Values in INR Lakhs till March 2021)*

Component	Sanctioned budget (till 2020-21)	Cumulative Release	Fund Utilization	% utilization
IDP	43,649	23,921	13,855	**58%**
CAAST	30,671	22,912	15,742	**69%**
IG	9,824	7,516	6,109	**81%**
Comp2	4,021	4,264	3,501	**82%**
Comp3	-	959	955	**100%**
NAHEP	**88,165**	**59,574**	**40,164**	**67%**

As observed in the table above, cumulative fund utilization **of Comp2 and IG is highest with >80%, followed by CAAST & IDP with 69% and 58% respectively. Fund utilization of comp 3 against cumulative release stands at 100%.** However, due to nationwide lockdown, Procurement and fund utilisation has not been progressing at desired / targeted pace, but timely procurement and finance review meetings and handholding webinars have played an important role in expediting the overall utilization.

d) Environmental safeguard measures

The project is categorized as **'Category B'** as per the environmental safeguard policy of the World Bank, as the interventions like '**Institutional Development Plans that would upgrade infrastructure for research and teaching**' (under sub-component 1a) may have negative impact on the surrounding environment. The interventions proposed under sub-components 1b and 1c 'CAASTs' and 'Innovation Grants' offers scope for enhancing the positive impacts on environment through integration of pro environmental measures.

Environmental Management Framework (EMF): It presents the '**legal and regulatory framework'**- a compilation of applicable acts, rules and regulations of GoI and identifies potential environmental risks and presents the mitigation measures along with green initiatives.

I. Capacity Building Programme:

National Workshops to Select AUs:

One online capacity building program at national level was organized on **4th May 2020** wherein 22 Nodal officers from 12 AUs of Call III awarded AUs participated. The objective of this workshop was to develop a common understanding and strengthen the capacities of nodal officers and orient them on the context and importance of EMF (Environmental Management Framework), preparation of ESP (Environmental Sustainability Plan) and its implementation, monitoring and documentation.

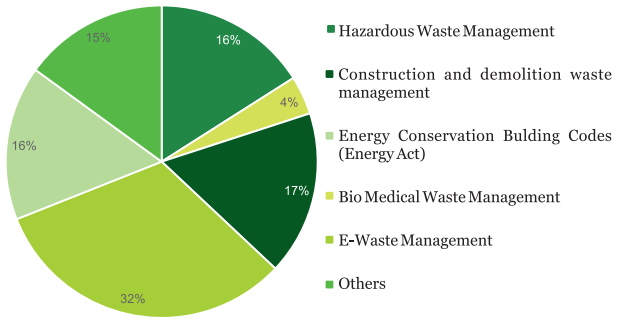
II. Preparation, submission and implementation of the ESP:

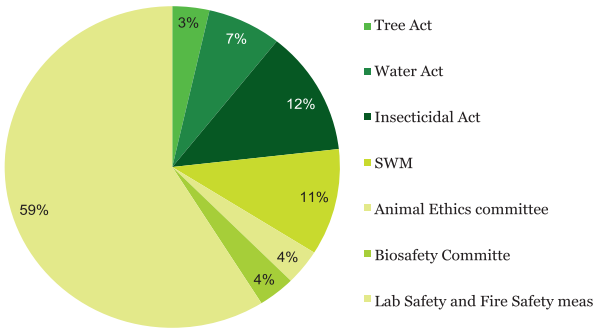
All 58 awarded AUs have prepared and submitted the project ESP. Call 1 and 2 AUs are already in the implementation phase of the activities proposed in ESP while, while Call 3 AUs have initiated the implementation process.

a. Compliance and status of ESP implementation

Regarding the Compliances applicable and integrated in ESP, AUs have already adopted the site-specific plan to deal with the environment safeguard issues. Measures for hazardous waste handling and lab safety provisions were planned & implemented by 15 and 19 AUs respectively as part of their renovation works. In addition, mitigation measures for air and noise pollution were also taken during the renovation work. AUs have adhered the necessary compliance measures required for appropriate waste management for different types of wastes discharged from various labs at AU level. Compliances were followed under the recommendations of Genetic **Engineering Approval Committee, Animal Ethics committee and Biosafety Committee** etc. Compliances applicable to AUs are presented below;

Compliance and activity status of ESP implementation
Number of AUs: 48





Call 1 and 2 awarded AUs have been following the compliences as per the ESP proposed. Out of total AUs, e-waste management through vendors, energy conservation through using LED bulb installation are some of the crucial initiatives followed by >50% of AUs. Whereas, implementation of lab safety and fire safety measures through awareness posters have been followed in majority of partner AUs.

Status of legal compliances and mitigation measures under Call 1

Under Call 1, all 28 AUs have accomplished their targets as per the proposed actions except NABL accreditation. Among partner AUs, IDP-TANUVAS has completed the necessary documentation process and has submitted the proposal for accreditation whereas CAAST-CIFE has completed the calibration of important instruments which is mandatory for accreditation. The overall status of legal compliance and green initiatives for Call- 1 AUs have been presented below:

Status of Legal Compliance and Green Initiatives under Call -1 AUs (28)

Measures	Plan	No of AUs implemented the actions	Activities
		Till March 2021	
Compliance with legal and regulatory requirements and Green Initiatives			
Hazardous Waste Management	9	10	• Segregation, storage, installation of Effluent treatment plant, display of information boards, etc.
Biomedical Waste Management	3	3	• Segregation, storage and handover to agency • Segregation, storage, Incineration at campus
Construction and Demolition Waste Management	11	10	• Debris is used as pathway in campus • Provision of safeguards to labour • Reuse of the demolition material
E-Waste Management	25	25	• Hand over to registered vendor
Energy Conservation Building Code	13	14	• Widening the windows for solar passive • Purchase of star rated appliances • Installed LED lights • Installed solar streetlights
Lab Safety Measures	14	19	• Installed fire extinguishers, display of poster on fire safety, first aid kits, organized mock drill, etc
Accreditation of Laboratories	3	3	-
Good practices			
Water conservation	11	16	• Renovation of rainwater harvest structure, percolation tanks, farm ponds, bore well recharge, etc.
Energy Conservation Adopted	9	17	• Solar streetlights, Solar pumps, E – Rickshaw, Cycles, etc.
Waste Management	7	20	• Color code dust bins in campus, compost units etc.
Plantation	10	19	• Plantation programme – **'One student – one tree'** programme in 3 AUs • Development of herbal garden, IDP Forestry, etc.

Measures	Plan	No of AUs implemented the actions Till March 2021	Activities
Conducted Pilot Courses related to Environment	5	5	-
On-going research work	5	5	• Conservation agriculture ensuring environmental sustainability • Disaster Management • Enriching elemental deficiency, carbon storage and enhancing productivity of the soil through Biochar • Biofloc technology for sustainable effluent management in Aqua farming • Microbial composition of inland saline water for environmental sustainability of aqua farming and to formulate best management practices for the same
Awareness Programme/ Lectures/ Workshops	0	30	• Lecture on environment concern related topics and celebrating world Environment Day, earth day, etc.

AUs under Call- 2: Under Call 2, 21 AUs have initiated the activities proposed in the ESP. Status of the activities is placed below;

SP actions	Plan	No of AUs implemented the actions Till March 2021	Activities
Legal Compliance and Green Initiatives			
Hazardous Waste Management	13	6	• Installed the waste segregation containers as per the color codes
C&D Waste Management	12	12	• Following safety measures at workplaces such as helmets, first aid kits, using debris alternative purpose, barricade and sign bords etc. • COVID advisory measures
E- Waste Management	18	7	• Established MoU with on-roll agency
Energy Conservation Building Code	9	7	• Purchase of star rated appliances • Installed LED lights • Installed solar panels, streetlights, etc. • Widening the windows for solar passive
Lab Safety Standards (Fire Safety)	10	7	• Installed fire extinguishers, display of poster on fire safety, first aid kits, organized mock drill etc.

SP actions	Plan	No of AUs implemented the actions Till March 2021	Activities
NABL Accreditation	1	0	-
Good practices			
Water conservation	7	9	• Rainwater harvesting structures, farm ponds etc. • 2 AUs have installed sensor-based water conservation system in the toilets
Energy Conservation	7	11	• Replaced regular lights with LED lights • Installation of solar panels on roof top
Waste Management	5	9	• Waste segregation, vermicompost units, decomposer
Plantation	6	15	• Plantation drive on World Environment Day
Courses / Trainings / Workshops	5	17	

Green Initiatives:

Apart from compliances followed under legal and regulatory framework, partner AUs under NAHEP have also undertaken other green initiatives at their campuses such as establishing rooftop solar SPV, landscaping, improving greenery in the campuses, initiatives to conserve water & energy etc.

AUs have carried out various activities such as renovation of farm ponds, check dams, percolation tanks, roof waste harvesting structure etc. to improve the water holding capacity of the reservoirs. Some of the AUs have also renovated bore wells to conserve or harvest water. **MPKV, Rahuri and KAU, Kerala** have planned to construct Effluent treatment plants (ETPs) at their campuses. West Bengal fisheries college, UAS Bangalore & NDRI Karnal have renovated their existing ETPs to enhance the capacity of the plants. Similarly, under energy conservation, **16 AUs** have adopted best practices to reduce the energy usages by replacing normal bulbs with LED bulbs, installing solar streetlights, sensor based electronic appliances etc.

Under waste management, segregation and composting the waste generated at the hostel and canteens have become a common practice. **TANUVAS Chennai, MPKV Rahuri and UAS Dharwad have declared their campuses as plastic free.**

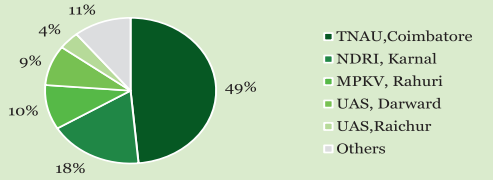
Planation programme is one of the common activities taken up in most of the campuses to enhance the greenery in the campuses. **One tree- one student/ 4 trees – one student** is being promoted to encourage the student's involvement while sustaining the greenery in the campus.

Analytical representation of Green & natural resource conservation initiatives

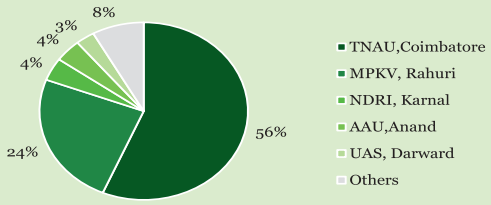
Greenery

Total number of plants	179375
Area (ha)	229 ha
Number of Species planted	720

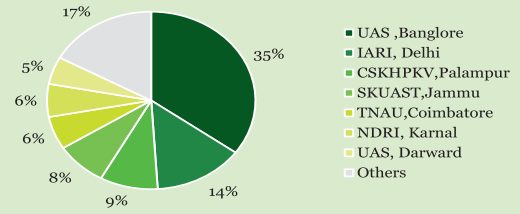
Distribution of plantation area by AUs



Distribution of number of plants planted by AUs



Distribution of number of species by AUs



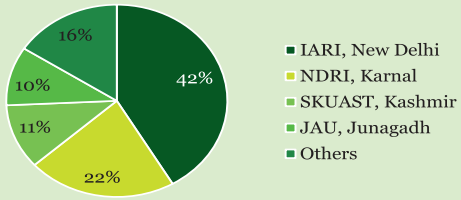
Energy Conservation

Major energy sources used to save electric energy

- Solar Energy: 4,714 kW
- Bio gas : 15.5 kW
- Bio Diesel : 14 kW

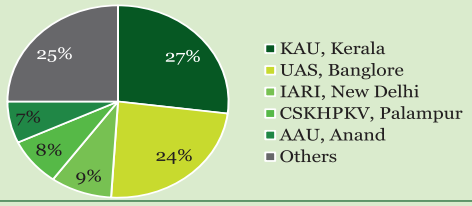
Distribution of solar energy power by partner AUs

Total solar energy: 4,714 kW

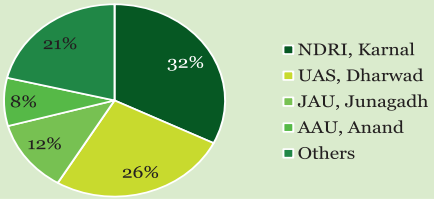


Conservation initiatives

- **LED Lights (number) : 11,224 (across 15 AUs)**



- **Star rated appliances (number) : 1,237 (across 9 AUs**



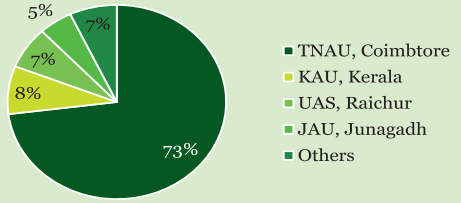
Water Conservation

Major energy sources used to save electric energy

Farm ponds: 36 crore L
Roof top water harvest structure: 36 lakh L
Percolation tank: 100 thousand L
Check dam: 12 lakh L

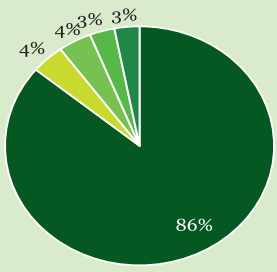
Roof top water harvesting capacity in 7 PAUs

Total capacity: 36 lakh L



Water conservation through farm ponds

Total capacity: 36 crore L



Analytical representation of Green & natural resource conservation initiatives

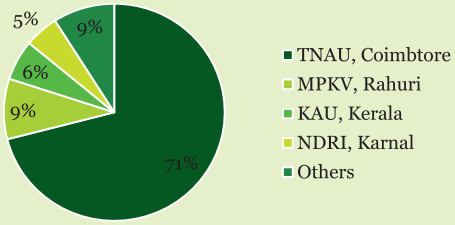
Waste Management

Major energy sources used to save electric energy

- Kitchen waste quantity : 171 thousand kgs
- Farm waste: 26 lakh Kgs
- Animal waste : 5 lakh Kgs

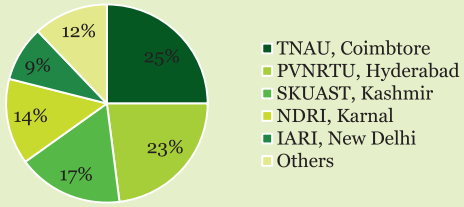
Distribution of kitchen waste treatment (across 10 AUSs)

Total quantity: 171 thousand kgs



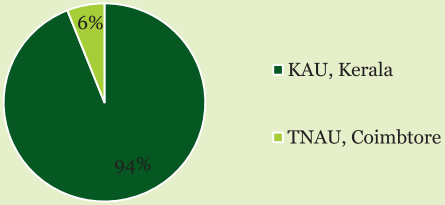
Distribution of farm waste treatment (across 12 AUSs)

Total quantity: 26 lakh kgs



Distribution of animal waste treatment (across 12 AUSs)

Total quantity: 5 lakh kgs



Green Building Concept at UAS, Dharwad

- Buildings require air, water, energy and space for its occupants. These are provided by systems in place like the ventilation system, the water supply system and the electricity supply system. The materials which are used in the construction of the building also produce environmental impact like carbon footprint, pollution through wastes and slurry, and the consumption of water and power. Buildings are one of the major sources of pollution that cause air pollution and are responsible for climate change.
- The objective of green building concept is to develop buildings which use the natural resources to the minimal at the time of construction as well as operation. Green buildings emphasize on the resource usage efficiency and also press upon the three R's – Reduce, Reuse and Recycle.
- The technique of green building maximizes the use of efficient construction materials and practices; boosts the use of natural sources and sinks in the building's surroundings; minimizes the energy usage to run itself; uses highly proficient equipment for the indoor area; uses highly proficient methods for water and waste management. The indoor equipment includes lighting, air-conditioning and all other needed equipment

Proposed Green building at UAS, Dharwad

Non-Timber Forest Products – Museum at NAU, Navsari

Analytical representation of Green & natural resource conservation initiatives

Non-Timber Forest Products – Museum

- Bamboo Museum was developed to conserve these species and to make them available to local farmers.
- One objective is informational – to display and profile the different uses of bamboo species, thereby improving local knowledge of and appreciation for conservation efforts

- A Non-Timber Forest Products (NTFPs) and Medicinal and Aromatic Plants (MAPs) museum was established under the banner of ICAR-NAHEP-CAAST sub-project entitled "Establishment of Secondary Agriculture unit for skill development in students and farmers". Approximately, 70 NTFPs and MAPs specimen are placed in museum. The collection of more specimens is in progress

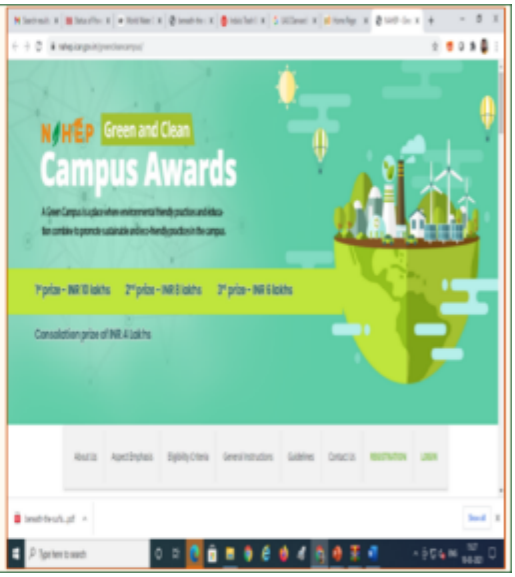
Green and Clean Campus Award initiative by PIU-NAHEP

Greening the campus is all about turning around wasteful inefficiencies and using conventional sources of energies for its daily power needs, correct disposal handling, purchase of environment friendly supplies and effective recycling program. Institute has to work out the time bound strategies to implement green campus initiatives. These strategies need to be incorporated into the institutional planning and budgeting processes with the aim of developing a clean and green campus.

The award instituted for the partner Agriculture Universities under the NAHEP.
This award encourages ensuring compliances and promoting adaptation and implementation of best practices related to environmental safeguards.
Number of Awards: 3 plus 1 consolation prizes

- Rs 10 lakhs – 1st prize
- Rs 8 lakhs – 2nd prize
- Rs 6 lakhs -3rd prize
- Rs 4 lakhs – Consolation prize

Web portal was developed for online registration and submitting of the document
Web address: https://nahep.icar.gov.in/greencleancampus/



Environmental Safety Measures undertaken at PIU level

PIU NAHEP has adopted IEC materials in the form of PoP on promoting Laboratory safety measures, fire safety measures and usages of fire extinguisher. The purpose is to adhere the safety measures in laboratories and campuses with improved environmental safeguard compliances. Soft copies were shared with the partner AUs to get it printed and displayed at appropriate places.

Analytical representation of Green & natural resource conservation initiatives

e) Social Safeguard Measures

The project does not have any significant involuntary resettlement impact and the project overall has been categorized as **"C" as per the Social Safeguard Policies**. The project institutions, especially those in low-income states, are located in states inhabited by tribal communities. Therefore, the World Bank **Operational Policy on Indigenous Peoples (OP/BP 4.10)** has been triggered, and an **Equity Action Plan** (EAP) has been developed to incorporate social considerations in project planning, implementation, and monitoring and to ensure that potential adverse impacts are adequately mitigated, and benefits of Project are further enhanced to improve the effectiveness as well as the sustainability of the Project. New construction activities are not allowed but the project has been financing limited construction activities within the existing premises. These activities have not been causing any significant environmental or social impacts; Hence, the **World Bank Operational Policy on Involuntary Resettlement (OP 4.12)** has not been triggered, but as limited construction activities are financed, keeping in mind the safety and security of labor, student, teaching and non-teaching staffs, a labor-management plan has been developed and implementing for civil construction work.

I. Capacity Building of Nodal officers

***National level* workshop**

During last 1 year, one National Level virtual Workshop for Call 3 AUs was organised during May 2020 wherein 44 Nodal officers (EAP & GRM) from 12 AUs participated. The objective of the workshop was to orient the nodal officers on the World Bank's safeguard policies and importance of Equity Action Plan (EAP), Grievance Redressal Mechanism (GRM), and Labor Management Plan (LMP) in NAHEP and its implementation, monitoring and documentation.

II. Equity Action Plan (EAP):

EAP is prepared in line with the Government of India's commitment to Inclusive Growth, in compliance with the World Bank's Operational Policy on Indigenous People (OP 4.10), and identifies key issues and problems affecting academic performance and overall development of students and recommends a set of actions to address the same. The Objective of the EAP is "**To ensure that all students and faculty in the project institutions have equal opportunity to avail the benefits of the Project with substantial improvement in the performance of students with special attention to the needy and ST and SC categories**." All project assisted institutions will be responsible for preparing and implementing the Equity Action Plan (EAP) as an integral part of project implementation for NAHEP".

As on date, all partner AUs (58) have prepared the detailed EAP as per the format provided by PIU under the guidance of World Bank. EAPs have been prepared on the basis of the project objectives and their focus areas under the sub-projects. Developed plans have further been implemented across all the partner AUs in FY2020-21.

III. *Improving the academic performance of weak students*

As part of the social safeguard measures, several interventions have been taken up by the partner AUs to ensure good performance of academically weak students. Interventions like English classes, peer group learnings, and remedial sessions have been promulgated to address the language and communication constraints among students of weaker sections. Most of the AUs have initiated trainings and motivational classes, to enhance the leadership qualities and achievements. A total of 16,419 students have been benefitted so far through various capacity building programs at AU level under different components of the project, out of which 6,505 were female students and rest 8,254 were male students. Amongst female students (39.6%), 2.6% belongs to ST category, 4.7 % from SC and 32.4% were from General category. Male students' participation was 60.4% wherein 3.3% belongs to ST category, 6.8 % were SC and rest 50.3% came from General caste category.

Here is the brief snapshot of achievements made for academically weak student under NAHEP

Activity	Female				Male				G. Total
	ST	SC	Gen	Total	ST	SC	Gen	Total	
Orientation for Fresher	86	97	1,120	1303	90	150	1,543	1,783	3,086
Identification of Weakness of Students	127	238	722	1,087	130	370	1,000	1,500	2587
Peer Education	70	130	1,062	1,262	90	150	1,546	1,786	3,048
English Language Course	15	36	415	466	28	67	726	821	1,287
Remedial Class	103	121	867	1,091	167	178	2,097	2.442	3,533
Student Teacher Mentoring	25	145	1,126	1,296	39	201	1,342	1,582	2,878
Total	426	767	5,312	6,505	544	1,116	8,254	9,914	16,419
% Contribution	**2%**	**5%**	**32%**	**40%**	**3%**	**7%**	**50%**	**60%**	**100%**

IV. *Social Inclusion:*

Scheduled Tribes (ST), Scheduled Castes (SC) and female students and faculties have been integrated into all the projects. Some AUs have been facing problems to ensure social inclusion as a sizeable population of SC/ST students has not been able to meet the eligibility criteria of 7.5 CGPA to get the benefit of international training. The NSC committee of NAHEP has decided to give 0.5 CGPA point relaxation for SC/ ST students to participate in International Training. The relaxation is an initiative to bring more inclusivity in International Training / Seminars. Here is the brief snapshot of achievements of social inclusion made under NAHEP:

Project beneficiaries – Students received training (Till March 2021)

Activity	Female				Male				G. Total
	ST	SC	Gen	Total	ST	SC	Gen	Total	
Overseas Training	10	20	227	257	8	16	145	169	426
National Level Training	3802	3000	15,833	22,635	4,998	2,997	20,641	28,636	51,271
Workshop/ Lectures	767	920	6,890	9,577	914	1,048	9,045	10,007	19,584
Special Skill Training	632	966	4067	5,665	933	1,009	5,908	7850	13,515
Total	5,211	4,906	27,017	37,134	6853	5,070	35,739	47,662	84,796
%Contribution	**6.1%**	**5.8%**	**31.9%**	**43.8**	**8.1%**	**6.0%**	**42.1%**	**56.2%**	**100%**

Out of 426 students those who undergone international training under NAHEP, 118 students have participated through virtual mode during January to June 2021 due to travel restrictions imposed because of Covid-19. **Out of which, 80 were female students (5 ST, 4 SC and 71 General caste) and 38 were male (4 ST, 8 SC and 26 General caste category) students.**

V. *Faculties' capacity building program*

Capacity building programs in the form of national & international trainings are aimed to make the faculties improve their knowledge, understanding of technology and research methodologies to augment the overall performance and teaching quality. Here is the brief snapshot of achievements of social inclusion made under NAHEP: Faculties

Activity	Female				Male				G. Total
	ST	SC	Gen	Total	ST	SC	Gen	Total	
Overseas Training	6	7	55	68	11	18	142	171	239
National Level Training	30	235	730	995	65	221	2,246	2,532	3,527
Total	36	242	785	1,063	76	239	2,388	2703	3766
% Contribution	1.0%	6.4%	20.8%	28.2%	2.0%	6.3%	63.4%	71.8%	100%

Out of 239 faculties who have undergone international trainings during the period, a total of 43 female and 100 male faculties have participated in the training through virtual mode.

VI. *User-Friendly Campus for differently abled and women*

The basic amenities accessible to everybody to facilitate daily functions are important. Hence, it should be barrier-free and adapted to fulfil the needs of all people equally. As an initiative of user-friendly campus, AUs have established ramps, user-friendly washrooms, installed CCTV cameras to enhance the security of women and incinerators for safe disposal of sanitary napkins. Most of the AUs are providing these types of facilities from their fund and all new buildings have user-friendly amenities. Under NAHEP it is mandatory to provide ramps if there is some renovation work in any old buildings. As per the EAP, AUs have to provide all planned amenities within the six months of project commencement.

As an initiative of user-friendly campus, 24 AUs have established 164 ramps, 9 AUs have constructed 17 escalators, 11 AUs have modified the existing washrooms to 259 user-friendly washrooms, 5 AUs have installed 512 CCTV cameras to enhance the security of women, and installed 39 Napkin vending machines by 14 AUs, 15 incinerators for safe disposal of sanitary napkins by 4 AUs, and 18 AUs have established 661 signboards till March 2021.

Particulars	Number	Number of AUs
Ramps	164	24
Washroom	259	11
Napkin vending machine	39	14
Incinerator for safe disposal of Sanitary Napkin	15	4
CCTV	512	5
Escalator	17	9
Wheel- chair	89	11
Mock drill	28	9
Streetlights	340	11
Signboard	661	18

VII. Labour Management Plan

The project is supporting minor civil works in terms of up gradation / refurbishment of existing infrastructure that typically includes classrooms, laboratories, library buildings, toilets, ramps, etc. The safety of students, faculty, and labour during the construction remains the prime concern for the AUs/ Institutions. The Heads of the institutions along with the site engineers and the contractors / sub-contractors are ensuring and managing safety provisions through the implementation of Labour Management Plan (LMP). Partnering AUs have been following the rules and regulations of the state government. Out of 58 AUs, **45 AUs have executed 237 civil works till March 2021.**

Performance monitoring on Social Safeguard indicators

Assessment of performance of NAHEP on SS indicators have been summarized below:

Sl	Particulars	Apr'19 to March'20	
		Plan	Achievement
1.	Number of courses/seminars/workshops /lectures on social aspects	110	224
2.	Number of documents with thrust on social / equity (papers, reading material, etc.) developed by faculties resulting from exposure within or outside the country	36	42
3.	Number of guest faculties delivering lectures or lessons on social / equity aspects	161	333
4.	EAP (Equity Action Plan) prepared and Implemented	58	
5.	Labour Management Plan prepared and implemented during civil works (renovation)	171	
6.	Grievance Redress Mechanism (GRM) prepared and addressed complaints within the stipulated time	23	
7.	SC / ST beneficiaries	19%	

IV. Learnings and Way Ahead

The learnings made during the last FY2020-21 and the way ahead towards achieving the desired objectives of the project, against each component are depicted in this section.

A. Component 1a

Learnings: Over last one year of implementation, IDP sub-projects have adopted the virtual / online mode of education as supplement to the regular mode of academic activities. This transformation has taken place due to restrictions of social distancing measures imposed by government. Due to adoption of online mode of academics, institutions have engaged themselves in developing e-content, online examination platforms, conducting webinars etc. and continuing the academic activities without any disruptions.

During the period, some of the partner AUs under IDP have also undertaken online international trainings for the students.

Over and above, awarded AUs have made timely efforts in reporting their achievements, out of box initiatives, digital initiatives undertaken etc. Such achievements and activities were also further compiled and documented as the learnings at component as well as PIU level and have been published for wider circulations.

Way ahead: Guided by the project objective and learnings gained during the implementation process, following are the activities essentially planned in the coming year:

a. Resuming the international trainings for students and faculties

Post relaxation for international travel by government, partner AU have planned for the international trainings and exposure visits for the students and faculties on various emerging areas in the agri and allied domain.

b. Strengthening digital infrastructure for academic sustainability

From academic continuity to sustainability, digital interventions play an important role. For the same, partner AUs of IDP are getting engaged in strengthening the existing infrastructure and are acclimatizing fast to meet the global standard of higher education to the students.

c. Curriculum and skill development for students:

Focus will be on entrepreneurship courses, vocational courses, skill development courses, internship programme, and exposure trainings for students in foreign institutes.

There will be increased efforts on integration of the new advanced courses in UG course curriculum and off campus exposure to students. Establishment of language lab to improve English proficiency skills will be also on the priority list of activities.

d. Faculty upgradation:

Catalyzing collaborations through alumni-faculty at foreign universities (student exchanges, adjunct faculty, virtual classrooms, etc.

e. Establishing linkage with alumni and industry, entrepreneurship development:

- University industry interface / workshop, strengthening placement cell for recruitment, collaborative research with industries, soft Skill development through lectures / demonstrations
- Industry linkages, collaborations and MoUs with other institutes and industries at national and international level to incorporate and promote live projects with industries.
- Industrial linkages to improve the problem-solving skills of the students. Initiatives for dual degree with reputed foreign universities.
- Leveraging state-of-art referral laboratory facilities for dairy and food industry at competitive commercial terms for revenue generation.
- Leveraging research facilities and business incubation set ups for improving entrepreneurship among students of partner dairy science colleges.

B. Component 1b

Learnings: During FY 2020-21, partner AUs under CAAST have been engaged in strengthening the digital infrastructure, organizing faculty upgradation and student training programs in various thematic areas in presence of domain and industry experts. In addition, most of the AUs were also actively involved in technology upgradation, its IP protection, technology trials and dissemination in their vicinity etc. in collaboration with the industry players, HEIs etc. Technology development initiatives undertaken by partner AUs such as introduction of the new seed varieties, farm equipment aggregation platform, innovative farming practices, dissemination of digital interventions under NAHEP - CAAST have been remarkable achievements this year due to such collaborations.

Way ahead:

a. Focus on establishment of **'on-campus, on-job and distance learning'** mode of PG diploma course
b. Establishment of virtual classrooms and delivery by experts to students & faculties
c. Enhanced focus on establishing marketing linkages for the products developed by AUs to generate internal revenue. Also, most of the AUs shall focus on validation and testing of products developed under the project.
d. Intensive efforts toward involving industry partners in student trainings, internships and interactions
e. Training and mentoring of PG students in new areas of agricultural research and advances in sciences and technologies will be taken up to strengthen their capacities in terms of market relevant practices

C. Component 1c

Learnings: There has been significant progress as planned in-terms of procurement and technical aspects. Most of AUs have procured the items as mentioned in the procurement planed and proposals submitted. As most of the partner AUs and colleges have been established in recent past as compared to IDP and CAAST AUs, there is limited availability of skilled resources/ subject matter specialists which needs to be addressed on priority basis.

Way ahead:

a. Capacity building, trainings and skill development of faculty and students:

- National Level trainings on skill development and entrepreneurship development in solar and other renewable energy systems
- International training-Use of Energy and Renewable Energy Technologies in Farming system
- Organization of capacity building programme on MOOCs

b. Expert lectures:

Organization of expert lecture series by national and abroad level eminent scientists, successful business entrepreneurs etc.

c. Strengthening of Infrastructure:

- Strengthening and renovation of laboratories
- Installation of all the equipment and accessories in the smart classrooms and incubation centers to make them functional
- Renovation of shade-nets / polyhouses / tunnels

d. Linkages and interactions: Organizing alumni meet, educational tour and industry visit, industry – institute meet

e. Entrepreneurship development:

- Entrepreneurship in Agricultural engineering
- Entrepreneurship and personality development among students

D. Component 2

Learnings: Sub-project under this component has progressed well and procurement progress has also picked-up the pace during the implementation. The sub-project has made pivotal step in developing, designing and successful implementation of more than 10 academic, financial and administrative web-applications through ICAR-IASRI and academic excellence related national level workshops through ICAR-NAARM under the component.

Over and above, a plan to roll-out the novel initiative Resilient Agricultural Education System (RAES) has been developed and streamlined for effective implementation of the initiative. Due to social distancing measures and travel restrictions during pandemic phase, **Resilient Agricultural Education System (RAES)** has been introduced under NAHEP, wherein teaching & learning will operate seamlessly across multiple situations and contexts, with minimal impact on the learners and other operational aspects such as assignments and examinations of the learners. NAHEP is Promoting Resilient Agricultural Education System (RAES) where focus will be on strengthening existing Digital infrastructure and online learning platforms in AUs, development of a discipline specific Digital Content repository and system wise Digital Capacity building program.

Way ahead: A few of identified strategies for better implementation are as follows:

1. Organization of National Trainings/ Workshops through Online mode.
2. Operationalization of 5 Career Development Centres including monitoring and guidance
3. Operationalization 1 faculty development centre including monitoring and guidance
4. Organization of network meetings in India and abroad with identified institutions for MoUs
5. Coordination of External Advisory Panel of globally renowned educational experts
6. Organization of National workshop on Academia – Industry – Government linkages
7. Develop guidelines for global collaboration among HEIs
8. Development of a framework for curriculum development in agricultural education

E. Component 3

Learnings: In addition to regular monitoring of sub- projects through **Project Monitoring and Tracking System (PMTS)**, M&E team of NAHEP has taken other important initiatives as well during pandemic period such as assessment of the measurable intermediate outcomes through Mid-line survey, Development and implementation of AU Implementation Performance Scoreboard (AUIPS), Satisfaction mapping of direct project beneficiaries, organizing M&E Clinics etc.

Way ahead:

a. Ongoing monitoring, evaluation and related capacity building initiatives

b. Clean and Green Campus Awards: An important initiative under NAHEP, which provides an opportunity to the awarded AUs to take a lead in redefining their approach towards environmental ambience & culture of AU and developing new paradigms while creating sustainable solutions to meet the related needs of the inhabitants.

c. Converting Waste to Wealth and linking entrepreneurship: A salient initiative to convert the waste into wealth is being implemented in select AUs under NAHEP.

d. Organising National level Hackathon KRITAGYA 2.0: Kritagya 2.0 is being organised under NAHEP with an objective "To provide opportunity to students to present their innovative approaches & potential solutions in animal and veterinary sciences in India.

e. As an important strategic initiative under NAHEP, a **Study on Assessment of Human Resource Requirement in Agriculture and Allied Sectors for next 20 years** is being undertaken.

NAHEP while incorporating the two World Bank Global Practices – Agriculture and Education, ensures the AUs' reform process benefits from innovations in both sectors across India and internationally. And, with the enhanced focus while corroborating National Education Policy (NEP) 2020 and strategic priority interventions at the Central and State levels, NAHEP will have profound and long-term impacts on agricultural higher education in India.

Annexure

A. List of approved 58 projects

Sub- component 1a: Investment toward 21st Century Agricultural Universities through Institutional Development Plan (IDP)

Sl.	Name of University	IDP Title	PI / Coordinator	Contact No.	email
1.	NDRI, Karnal	Incentivizing Dairy Education through Innovative Learning Approaches	Dr. S.K. Tomar, Principal Scientist (Dairy Microbiology)	9896431072	sudhirndri@gmail.com
2.	CCS HAU, Hissar	Strengthening Institutional Capacity to Produce Skilled Professional for Market Driven Agriculture	Dr. D.S. Dahiya (DSW)	9728666725	dsw@hau.ac.in piidpccshau@gmail.com
3.	MPUAT, Udaipur	Institutional Development Proposal (IDP) for strengthening undergraduate education in agriculture and allied fields	Dr. Ajay Sharma Department of Mechanical Engineering	9928082027	sharma_ajayk@yahoo.com mailto:bpnand@gmail.com
4.	AAU, Jorhat	Strengthening Assam Agricultural University with Education Quality Parameters for Production of 21st Century Ready Human Resource	Dr. Kishore Kumar Sharma, Professor, Department of Plant Breeding and genetics	9435489157	drkksttb@yahoo.co.in
5.	OUAT Bhubaneswar	Branding the University for Excellence and Equity in Agricultural Education to Produce Skilled Graduates for Enhanced Employment and Entrepreneurship	Dr. Rama Chandra Dash, Professor	9437632319	ramadash@gmail.com
6.	JAU, Junagadh	Institutional Development Plan for Junagadh Agricultural University, Junagadh, Gujarat -	Dr. V.P. Chovatia, Director of Research	9879104661	dr@jau.in
7.	ANGRAU, Lam (Guntur)	Institutional Development Plan (IDP) of Acharya N G Ranga Agricultural University (ANGRAU), Andhra Pradesh	Dr. S.R Koteswar Rao (till 05.01.2020) Dr. Pratap Kumar Reddy	9618881023	idp.angrau@gmail.com
8.	TANUVAS, Chennai	Institutional Development Plan of Tamil Nadu Veterinary and Animal Sciences University -	Dr. John Kirubaharan Professor, Department of Veterinary Microbiology	9840278491	jjohnk@gmail.com johnkirubaharan.j@tanuvas.ac.in
9.	SKUAST, Kashmir	Make SKUAST-K a preferred destination of Agri-Education for its Creativity, Innovation, Entrepreneurship, Leadership, Diversity and Equity"	Prof. Nazir Ahmad Ganai, Director of Planning	09419018745; 7780882991	drnazirahmad@gmail.com directorplanning@skuastkashmir.ac.in
10.	GADVASU, Ludhiana	Institutional Development Plan for Improved Learning, Outcome, Skill and Entrepreneurship at GADVASU	Dr. Sarvpreet Singh Ghuman	8146237600	ghuman_s@yahoo.co.in

Sl.	Name of University	IDP Title	PI / Coordinator	Contact No.	email
11.	GBPUAT, Pantnagar	Institutional development plan of GBPUAT for Improving the Academic and Governance System of the University for enhancing Learning Outcome	Dr. Shivendra Kashyap, Dean, College of Agriculture	7500241487	kashyapsk@gmail.com
12.	TNAU, Coimbatore	Enhancing the learning outcome, employability and entrepreneurial skills of farm graduates through excellence in education	Dr. S.D. Sivakumar, Director, Agribusiness Development	0422-6611377; 9489056714; 9442652310	business@tnau.ac.in
13.	UAS, Dharwad	Augmenting quality and relevance of higher agricultural education through enhanced learning outcome and entrepreneurship development	Dr. P.U. Krishnaraj, Professor	0836-2214281; 9845906301	krishnarajpu@gmail.com
14.	RVSKVV, Gwalior	Reinforcement of the brand Value of university for designing market ready graduates for entrepreneurship and employment generation	Dr. Sanjay Kumar Sharma, Professor & Head, Department of Soil Science & Agricultural Chemistry	9893946434	sanjayjbp.2007@rediffmail.com
15.	CAU, Imphal	Enhancing Entrepreneurial Competence in Students to address the emerging Challenges in Agriculture and Allied Sectors	Dr. S Basanta Singh, Director of Instructions	9612161841	di.office@yahoo.com
16.	DYSPUH&F, Solan	Quality Education in Horticulture and Forestry to Generate Human Resource with Entrepreneurial Skills	Dr KK Raina, Head, Division of Business Management	9418066325	hodmba@yspuiversity.ac.in
17.	SKNAU, Jobner	Institutional Development Plan on Strengthening Academic Ambiance for Quality and Skill Oriented Undergraduate Education at SKNAU, Jobner	Dr. A.K. Gupta, Dean College of Agriculture	9414820563	director.research@sknau.ac.in
18.	DUVASU, Mathura	Institutional development plan of DUVASU for Improving the Academic and Governance system of the University for Enhancing Learning Outcome	Dr. Atul Saxena, Professor & Head Department of Obstetrics & Gynecology	9412726813	dratulsaxena@rediffmail.com

Sub-component 1b: Investments in Centres for Advanced Agricultural Science and Technology (CAAST)

Sl.	Name of University	Project Title	PI Name	Contact No.	Email
1.	BCKV, Mohanpur	Centre for Advance Agricultural Science & Technology on Conservation Agriculture	Prof. Srikanta Das Department of Plant Pathology Bidhan Chandra Krishi Viswaviyalaya Mohanpur, West Bengal	9433285115	das.srikanta@bckv.edu.in
2.	CIFE, Mumbai	Development of Energy Efficient and Environment Protective Aquaculture Technologies for Degraded Soils	Dr. Gopal Krishna Director, CIFE, Mumbai	9869085260	gopalkrishna@cife.edu.in gayatrit@cife.edu.in

Sl.	Name of University	Project Title	PI Name	Contact No.	Email
3.	CSAU&T, Kanpur	Centre for Advance Agricultural Science & Technology on Nutritional Crops	Dr. H.G. Prakash, Director Research (AES)	09412156124	directoraes@csauk.ac.in, drhp_k@yahoo.co.in
4.	MPKV, Rahuri	Centre for Advance Agricultural Science & Technology on Climate Smart Agriculture and Water Management	Dr. Sunil D. Gorantiwar, Professor & HOD, Deptt. of Irrigation and Drainage Engineering	09881595081	gorantiwars@gmail.com
5.	IVRI, Izatnagar	Centre for Advance Agriculture Science & Technology on Advanced Centre for Livestock Health	Dr. Amit Kumar, Senior Scientist, Department of Animal Genetics & Breeding	09219614456	vetamitchandan07@gmail.com
6.	NAU, Navsari	Establishment of Secondary Agriculture Unit for skill development in students and farmers at NAU, Navsari	Dr. T.R. Ahlawat, Associate Director of Research	09879124272	tahlawat4@gmail.com
7.	IARI, New Delhi	Genomics Assisted Crop Improvement and Management	Dr. Viswanathan Chinnuswamy, Head, Plant Physiology	09013885245	viswanathan@iari.res.in
8.	UAS, Bangalore	Centre for Next Generation Technologies in Adaptive Agriculture	Dr Rajendra Prasad, VC, UAS, Bangalore	09452883308	srprasad1989@yahoo.co.in
9.	PAU, Ludhiana	School of Natural Resources Management for Sustainable Agriculture	Dr. O.P. Chaudhari, Head, Soil Science	8196080649	opchoudhary@pau.edu
10.	AAU, Anand	Establishing Centre for Agricultural Market Intelligence at AAU, Anand	Dr. R. S. Pundir, Professor, IABMI	02692-264052, 262052	rspundir@aau.in
11.	BAU, Ranchi	Standardization of Integrated Farming System Models for the State of Jharkhand	Dr M.S. Malik, Prof and Scientist	9934582241 8789823611	mohdshujamalik@yahoo.com
12.	CSKHPKV, Palampur	Protected Agriculture and Natural Farming	Dr. Ranbir Singh Rana, Principal Scientist (Agronomy)	01894-232245/230311	ranars66@rediffmail.com rsrana@hillagric.ac.in
13.	KAU, Kerala	Knowledge and Skill Development on Coconut Based Secondary Agriculture	Dr. Sujatha. R. Professor (Pb&Gn) ADR, Coconut Mission	9495981544	sujatha.r@kau.in
14.	VNMKV, Parbhani	Centre of Excellence for Digital Farming Solutions for Enhancing Productivity by Robots, Drones, and AGVs	Dr. Gopal Uttamrao Shinde, Asst. Professor	9422111232	gushindevnmkv@gmail.com
15.	JNKVV, Jabalpur	Skill Development to Use Spatial Data for Natural Resources Management in Agriculture	Dr. R. K. Nema, Dean CoAE	9407001170	deancae@yahoo.com
16.	MAFSU, Nagpur	Centre of Excellence for Advanced Research on Animal Food Safety	Dr. R. J. Zende, Prof. & Head, Department of Veterinary Public Health	9969625744	ravindrazende@gmail.com

Sub-component 1c: ICAR Innovation Grants to Agricultural Universities

Sl. N.	Name of University	Project Title	PI Name	Contact no.	Email
1.	BASU, Patna	Proposal for Innovation Grant under NAHEP	Dr. Ravindra Kumar	9418085904	drbasu2017@gmail.com
2.	SKRAU, Bikaner	Proposal for Innovation Grant under NAHEP -	Dr. N. K. Sharma, Director, (IABM)	9414275222	director@iabmbiker.org
3.	Dr. PDKV, Akola	Capacity building and skill development in renewable energy under NAHEP	Dr. S.R. Kalbande, Prof. & Head, Deptt of Renewable Energy,	7588763787	surenkalbande@gmail.com
4.	PVNRTVU, Hyderabad	Modernization of veterinary clinical complex and establishment of veterinary diagnostic & feed analytical laboratories	Dr. K. Satish Kumar	09848421375	dirofresearch@gmail.com drkbpr@gmail.com
5.	AU, Jodhpur	Innovation Grant under NAHEP for Strengthening of Agriculture University, Jodhpur for Accreditation	Dr. B. S. Bhimawat	09414289818	rajpurohitbsingh@gmail.com
6.	AU Kota	Innovation plan for hi-tech Horticulture -	Dr.I.B. Maurya, Dean, College of Horticulture & Forestry	9887095532	ibmaurya@rediffmail.com
7.	SVVU, Tirupati	Innovation Grant Proposal	Dr.A.Ravi, Professor & Technical Officer to VC,SVVU, Tirupati	09849932715	raviakst@gmail.com
8.	MPHU, Karnal	Research-cum-Technology transfer centre on protected cultivation	Dr. Ajay Singh Yadav	09813486046	regimhu.hry@gmail.com
9.	PJTSAU, Hyderabad	National Knowledge management central for Agriculture Education and Research	Mr. N.P. Ravi	09347574626	nahep.nkmc4aer@gmail.com
10.	Kamdhenu University, Gandhinagar	Making Kamdhenu University. College of Dairy Science, reform ready for accreditation	Dr. Vimal Ramani, Dean, College of Dairy Sciences	9879527043	dean.dairy@kuguj.com
11.	Dr. RPCAU, Pusa, Samstipur, Bihar	Automation of University activities and digitization of the documents	Dr. S.k. Jain	9430489408	skjain@rpcau.ac.in
12.	ANDUA&T, Ayodhya	Strengthening and modernization of Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya to make the University ready for accreditation	Dr Harnam Singh	9451091537	hnsingh1758@gmail.com
13.	UAS, Raichur, Karnataka	Digitization of Library for information services to strengthen and develop competitive human resources at agricultural university	Dr. D.N. Chandargi	9448267413	dmchandargi123@rediffmail.com
14.	RLBCAU, Jhansi	Strengthening teaching – learning ambience for excellence in academic, research and extension	Dr. S. K. Chaturvedi	9336214977	deanagriculture.rlbcau@gmail.com

Sl. N.	Name of University	Project Title	PI Name	Contact no.	Email
15.	SKLTSHU, Hyderabad	Strengthening of College of horticulture, Mojerla for attaining ICAR Accreditation	Dr. A. Girwani	9866558986	cohmojerla@gmail.com
16.	UBKV, West Bengal	Smart curricula delivery through virtual classrooms as communication Linked Interface for Cultivating Knowledge and online courses	Dr. Pradyut Kumar Pal	03582 270141 / 270013	prodyut24@yahoo.com
17.	WBUA&FS, West Bengal	Strengthening Post Graduate Education and Outreach Programmes at faculty of Dairy technology, west Bengal university of Animal and fishery sciences, Kolkata, West Bengal	Dr. Lopamudra Haldar	9862714273	drpbiswas1956@gmail.com
18.	VCSGUH&F, Bharsar, Uttarakhand	Strengthening of VCSG Uttarakhand University of Horticulture and Forestry, Bharsar	Prof. B P Nutiyal	9412986036 7351939177	deanhortbharsar@gmail.com, bhagwatinautiyal@gmail.com
19.	IGKV, Raipur, Chhattisgarh	Creation of Facilities and Modernization of the College.	Dr. S. S. Rao	09425525597	ssrao1959@yahoo.com
20.	SVPUA&T, Meerut	Institutional capacity building leading to accreditation of Colleges	Dr. Anil Sirohi	09410275769	anilsirohi@rediffmail.com
21.	KVASU, Wayanad	CASM (under KVASU) - Proposal for ICAR Innovation Grant under NAHEP	Prof. (Dr.) G. Girish Varma	9446229673	girish@kvasu.ac.in pfso@kvasu.ac.in casmt@kvasu.ac.in
22.	CGKV, Durg	Upgradation of Academic and Research Facilities of College of Fisheries, Kawardha, Durg	Dr. O. P. Mishra	9827163521	drscgkv@gmail.com
23.	NDVSU, Jabalpur	Innovation Grant under National Agricultural Higher Education Project for Strengthening of College of Fishery Science, Nanaji Deshmukh Veterinary Science University, Jabalpur (IG)	Dr. R.P.S. Baghel	9425863305	deanfaculty@rediffmail.com
24.	RAJUVAS, Bikaner	Establishment and strengthening of livestock innovation, knowledge, entrepreneurship, skill center for accreditation	Professor Sunil Maherchandani	9351205627	smchandani86@gmail.com

Component 2A

Sl. No.	Name of University/ Institute	Project Title	PI/CPI Name	Contact no.	PI/CPIs email
1.	ICAR-IASRI, New Delhi	Investment in ICAR Leadership in Agricultural Higher Education	Dr. Sudeep Marwaha Head (A) and Prof. Division of Computer Applications, ICAR-IASRI, New Delhi	9711707437	sudeep@iasri.res.in
	ICAR-NAARM, Hyderabad		Dr. S. K. Soam	9440945340	soam@naarm.org.in

B. AU wise detailed activities undertaken and plan ahead

a) Component 1 A (IDP)

I. ICAR-National Dairy Research Institute, Karnal

Project Title: Incentivizing dairy education through innovation learning approach

There are multiple activities carried out by ICAR-NDRI, Karnal during this period. Out of the total budget, institute has utilized 57% budget. Establishment of language learning labs, organizing online international trainings for faculties and students, organizing national level skill development programs for B. Tech students, developing data analytics courses, establishing International Relations and Alumni Engagement (IR&AE) Office are few of the key activities and initiatives undertaken by NDRI during FY2020-21 through innovative learning approaches.

Exhibit: Key activities

NDRI established fully equipped Language Lab with modern technologies during FY20-21

AU enhanced orientation of the ultrasound facility by procuring Color Doppler Machine

II. CCS Haryana Agricultural University, Hisar

Project Title: Strengthening institutional capacity to produce skilled professional for market driven agriculture

Under NAHEP CCS Haryana Agricultural University (HAU) is implementing Institutional Development Plan (IDP). Partner AU has established various facilitative labs such as nutrition lab, farm machinery lab etc. Also, development of smart classroom, establishing agri-business incubation centre at AU were amongst major infrastructure development initiatives. Over last one-year, AU has cumulatively utilized 43% of the total budget outlay.

Exhibit: Key activities

AU organised 'Enhancement of Handicrafts Skills for Entrepreneurship Development' for students during the period

Modernization of existing classroom to Smart Classroom by partner AU

Plan Ahead

- Students and faculty international training programme
- Students National training at premier training institutes covering exposure visits
- Skill enhancement and entrepreneurial training through agri incubation centre
- National and International conference (1 each), industry linkage conclave for better student placement avenues, conduct three certificate courses for students majorly on skill development and entrepreneurship development.

III. Maharana Pratap University of Agriculture and Technology, Udaipur

Project Title: Institutional Development Proposal for strengthening undergraduate education in agriculture and allied fields

The AU has utilized 39% of the total budget as planned. Establishing startup cell, virtual classrooms, organizing English language proficiency and personality development classes are some of the key initiatives carried out by AU.

Exhibit: Key activities

Technology developed under technical initiatives by partner AU where 'Bubbling Fluidized Bed Gasification Technology for Bio Hydrogen Production' through Gasification of Agro Residues

Equipment developed during Hands on Training on Gau-Kasth for Skill and Entrepreneurship Development where participants learnt about cow-dung waste management and its potential & utilization and production of value-added products from cow-dung

Plan ahead

- Efforts will be made to organize International Training and other activities considering post COVID situations.
- Emphasis will be given to organize industry interactive activities
- Plan for capacity building activities for faculty

IV. Assam Agricultural University, Jorhat

Project Title: Strengthening Assam Agricultural University with education quality parameters for production on 21st century ready human resource.

The project at AU has progressed well during the year as indicated by 57% of the budget utilization. Establishment of placement cell, lab modernization, organisation of skill development and other capacity development programs are some of key activities carried out by AU.

Exhibit: Major activities at AU

Hands on training to students on various aspects of poultry husbandry and meat processing

A book was prepared by Department of Plant Pathology and published by NAHEP, AAU on 'Biopesticides: Role in Sustainable Agriculture, Production Technologies and Entrepreneurship opportunities in Assam'

NAHEP Sponsored Training conducted on 'Entrepreneurship in Bakery

Skill development training programme on Pig production and Pork processing conducted under NAHEP

Plan Ahead

- Faculties are asked to submit project proposals for enhancing capacity building of the teachers and students
- Exposure visits of students and international training of faculty are lined up at the end of the year
- Shifting from conventional classroom to online/ virtual platform-based classrooms
- Development of Language Lab

V. Odisha University of Agriculture and Technology, Bhubaneshwar

Project Title: Branding the university for excellence and equity in agricultural education to produce skilled graduates for enhanced employment and entrepreneurship

As of now AU has utilized 41% of the budget during the FY2020-21. Establishment of e-library, smart classrooms, organisation of industrial internships for students, collaboration with academic and research institutes are some of the key activities carried out by AU during the period.

Exhibit: Key activities-MoUs established during the period	
Name of the MoU signed	**Name of Institute / *Organization / industry with whom MoU signed***
• Climate Smart Agriculture	International Rice Research Institute (IRRI), Philippines
• Collaboration for academic and research	University of Nebraska Lincoln (UNL), USA
• Collaboration in agricultural research and education	Indian Institute of Technology, Delhi
• Collaboration in agricultural research and education	Indian Institute of Technology, Roorkee
• Promotion of students' training and quality postgraduate research in cutting edge areas.	Indira Gandhi Krishi Viswavidyalaya, Raipur, Chhattisgarh
• Collaborative academic research activities	CSIR-Central Institute of Medicinal and Aromatic Plants, Lucknow
• Collaborative academic research and training activities	ICAR-Central Institute for women in Agriculture, Bhubaneswar
• Collaborative academic research and training activities	ICAR-Central Tuber Crops Research Institute
• Collaborative R&D activities on geo-spatial tools and applications	Space Application Centre (SAC), Ahmadabad

Plan ahead

- Focused approach for completion of international training programmes for students and faculties
- Professional and entrepreneurial skill development programmes will be taken up
- Soft skill/English communication skill programmes will be taken up

VI. Junagadh Agricultural University, Junagadh

Project Title: Institutional Development Plan for Junagadh Agricultural University, Junagadh, Gujarat

Over last one year, IDP-JAU-Junagadh has utilized 70% of the total budget till March 2020. Activities like establishment of AI lab, Bioinformatics lab, design and implementation of market-oriented course curriculums, collaborations with industry players for internships and training programs have been highlighted by AU during the presentation.

Exhibit: Key activities

Modernization of laboratories with world class equipment like ION-CHEF, Robotic Clay Fraction Analyzer and Feed Mill

Plan ahead

- Targeted efforts on international training programmes for students and faculties
- Focus is to be given on student internship and placement opportunities in corporate sector, and events will be conducted related to students' start-up activities.

VII. Acharya N G Ranga Agricultural University, Andhra Pradesh

Project Title: Institutional Development Plan of Acharya N G Ranga Agricultural University Human Capacity Building

ANGRAU, Lam-Guntur AU under IDP has utilized 53% of the total budget. Leveraging ICT infrastructure such as development of virtual classrooms, establishing Academic Management System to enhance the student's learning outcomes, organizing trainings programs for students and faculties, involvement of alumni, establishing MoUs with national level organisation are some of the key activities carried out by AU during the period.

Exhibit: Key achievement

<table>
<tr><td> 
</td><td>  </td></tr>
<tr><td>Alumni management portal has been developed for establishing linkage between alumni and institute</td><td>Establishment of smart classroom at partner AU during the period to enhance the learning outcomes</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Exposure visits to agribusiness companies under NAHEP initiatives</td><td>Modernization of AU laboratories, Central Instrumentation Facilities during the period under NAHEP</td></tr>
</table>

Plan ahead

- Organize online national trainings, skill development programmes, national/international lecture series, webinars, workshops for the benefit of students and faculty until the covid pandemic subsides
- Rescheduling the international training programmes for faculty and students
- Development of green campuses and digital infrastructure in the university

VIII. Tamil Nadu Veterinary and Animal Science University, Chennai

Project Title: Institutional Development Plan of Tamil Nadu veterinary and Animal sciences university

During last year, AU has utilized ~50% of total budget as planned. In this period, initiatives like establishment

of Learning and Assessment Centre, Virtual and Augmented Reality facility, smart classrooms, development of e-learning modules are few to mention

Establishment of facilitative centre at AU:

Digital Intervention	Brief	Photograph
Learning and Assessment Centre (LAC) by TANUVAS, Chennai	• Partner AU has established LAC facilities where actual size animal simulations have been enabled with Holstein dystocia simulator, Haptic Vet Cow simulator, Canine Surgical simulator etc. • These simulation models are being used to provide the real near experience to the students without harming the actual animals. • Practical sessions were organised for students in LAC to enhance the learning outcomes of the students, provide the clinical experience of various categories of animals/species.	

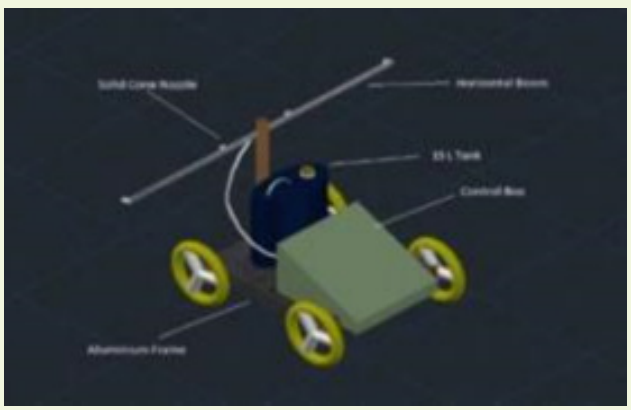
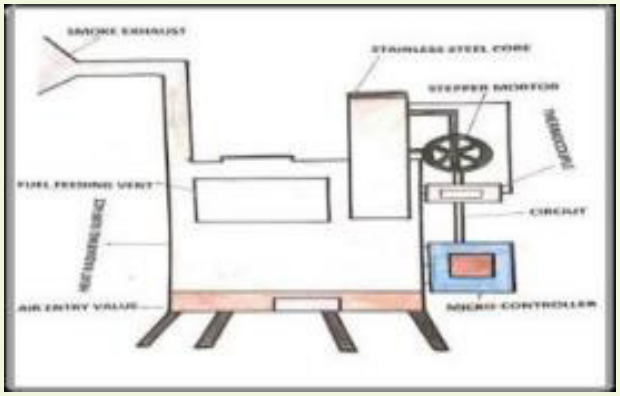
Plan ahead:

- Students (37 nos.) were selected to undergo overseas clinical training students will be sent if the overseas Universities are willing to accept students amid COVID-19 pandemic
- Selection of faculty to undergo overseas training and short visit was completed and they will be sent if situation permits
- Learning apps, animated lessons, video lessons and e-atlases to enhance student-centered learning, which are under progress will be completed

IX. Sher-e-Kashmir University of Agricultural Sciences and Technology, Kashmir

Project Title: Make SKUAST-K a preferred destination of Agri-Education for its Creativity, Innovation, Entrepreneurship, Leadership, Diversity and Equity

Over the last year, AU has utilized 82% of the total budget released. Initiatives like organisation of online-international training for faculties and students, establishment of discovery centre, development of computer labs, GIS and RS lab, Virtual classrooms, digital libraries are few to mention

Exhibit: Key achievement	
	
Remotely controlled self-propelled boom sprayer developed by partner AU under NAHEP	Low cost Pyrolizer is used for orchard residue and weed management purposes.

Digital Intervention	Brief	Photograph
Academic & Examination Management System developed by SKUAST, Kashmir	• Partner AU has developed the Academic and Examination Management System, where academic records of the students are being placed for administration purpose, exams are being conducted amidst social distancing norm imposed due to Covid pandemic • This application gives access to students on e-content modules, class schedules, academic calendar and enable to participate for examination	

Plan ahead:

- Building DISCOVERY Center at SKUAST, Kashmir for AI and ML Centre, SKIIE Centre, IPR and TM Cell, Big Data Analytical Cell
- Plan for organizing 'International Trainings' for students as well as faculties
- Organising various activities related to building philanthropic alumni through Alumni Meet, Industry Interaction Drive etc.
- Development of MIS for Automation of HRM and Finance Management

X. Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana

Project Title: Institutional Development Plan for Improved Learning Outcome, Skill and Entrepreneurship at Guru Angad Dev Veterinary and Animal Sciences University

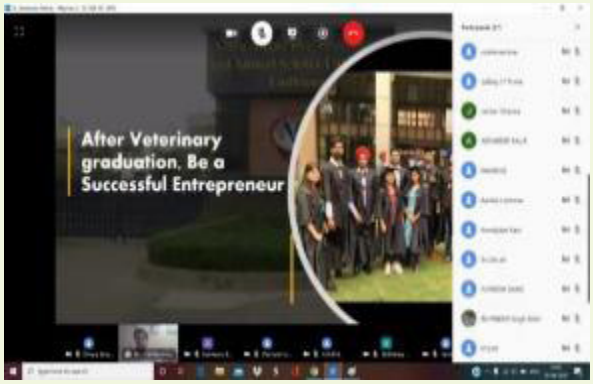
GADVASU-Ludhiana AU under IDP has utilized 76% of the total released budget and completed all the procurement for the year. Over the year, AU has established 13 smart classrooms and conducted over 25 national level programs for students. AU has also established strengthen the alumni network through online registration, alumni lectures and by organizing alumni meet at campus.

Exhibit: Key activities


Ludhiana Tribune

Academia webinar on shrimp farming held

Organised 'Industry-farmer-academia webinar on "Covid-19 crises: mitigation strategies for shrimp farmers in Punjab"' workshop under IDP



Organized various programs on Entrepreneurship during the FY2020-21

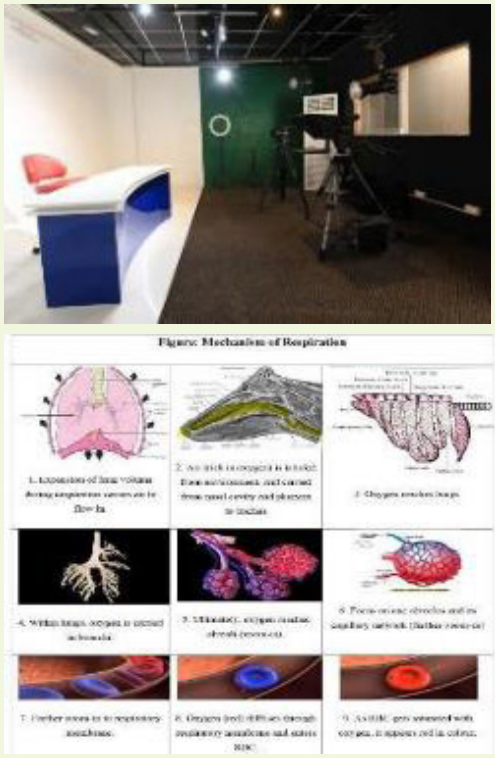
Plan ahead:

- International Trainings for both faculty and students initiated and will be accomplished.
- Exposure visits, workshops, seminars, alumni meet will be undertaken as early as possible

XI. G.B. Pant University of Agriculture and Technology, Pantnagar

Project Title: Institutional development plan of GBPUAT for Improving the Academic and Governance System of the University for enhancing Learning Outcome

AU has utilized ~70% of the total budget released. Activities like AR/VR facilities, e-content development studio, development of smart classrooms, language lab development activities have been carried out by AU during the period.

Digital Intervention	Brief	Photograph
Development of e-content studio at GBPUAT, Pantnagar	• To promote the promoting 360^0 learning environment, partner AU has developed the interactive user-friendly e-modules at e-content studio. • More than 100 faculties of the partner AU have collectively made efforts for the development of textual, hyperlinked photos, animations and video linked e-content modules. • The e-content created in interactive workbook format with question-answer, references, cases, illustrations, learning activities and other interactive linkages. • Till date more than 500 such modules have developed and being streamed online through e-module portal developed by partner AU under NAHEP	

Plan ahead:

- Alignment with international institutions have been set into place for international level training of faculty and will be put into instant action with opening of international borders.
- Collaborations and connects made at national and international platforms via Alumni Networks, Industry Experts, Foreign Faculty of International Repute, External Advisory Panel will be taken forward for successful and long-term partnerships for two-way growth.
- Institutionalizing all novel initiatives of IDP-NAHEP, Pantnagar in order to ensure their effective continuance and sustenance.
- An exit plan for the project is under development in order to sustain with the project initiatives and activities in a more vigorous way

XII. University of Agricultural Sciences, Dharwad

Project Title: Augmenting quality and relevance of higher agricultural education through enhanced learning outcome and entrepreneurship development

AU has utilized ~60% of the total budget released. Developing language laboratory, launch of ASTRA for entrepreneurship development, organisation of Ideathon, alumni meet these are some of the key activities carried out by partner AU.

Type of facilitative centre	Brief	
AI lab/ Center	• UAS, Dharwad in association with HAEGL Technologies Pvt. Ltd has organized three training programmes during January to August 2020 for third year UG students to impart the hands-on-training on AI and Machine Learning. • AU has hosted these programs in presence of Er. Gautam Shigaonkar, CEO (HAEGL)	
Industry Institution Interaction Cell (IIIC)	• IIIC has been established at university's administrative building. The cell is well equipped with modern electronic fixtures *(lecterns, digital podium, 80-inch interactive screen & wi-fi network).* • This facility will be used for the future guest lectures and industry interactions.	
Tissue Culture Unit	• A tissue culture lab for imparting hands-on training to UG students has been established with state of art equipment including Deep freezers (-860), Bio-safety cabinets etc.	
Language lab	• Mr. B. C. Patil, Hon'ble Agriculture Minister, Govt. of Karnataka inaugurated Language Laboratory at UAS, Dharwad in November 2020. • Each system in the lab has been equipped with the 8 English language modules. Each module has the detailed content followed by assessment. • To improve the academic performance and enhance the participation of students in extracurricular activities, remedial courses in English Language have also been commenced under NAHEP-IDP. • So far, **5 batches of the course** have been completed and **120 students** have benefitted through language lab. • Currently, lab has a capacity of **20 users per batch**.	

Type of facilitative centre	Brief	
Collaboration with Association for Startups and Technology Refinement in Agriculture (ASTRA)	• To understand the current and future market needs, AU has collaborated with ASTRA in Sept 2020 under IDP. • In association with ASTRA - an incubator, AU has taken an initiative to engage the students in various entrepreneurial activities and provide them an opportunity to engage with the industry and private sector players including agri startups.	

XIII. Tamil Nadu Agricultural University, Coimbatore

Project Title: Enhancing the learning outcome, employability, and entrepreneurial skills of farm graduates through excellence in education

The AU has utilized 92% of the total budget released. Development of market-oriented course curriculums, establishing MoU with industry players, organizing skill development and other capacity building programs are some of the key activities carried out by partner AU.

Exhibit: Key activities

Skill development training on "Drone Applications in Agriculture"

Development of e-learning modules on Artificial Intelligence and Big Data Analytics

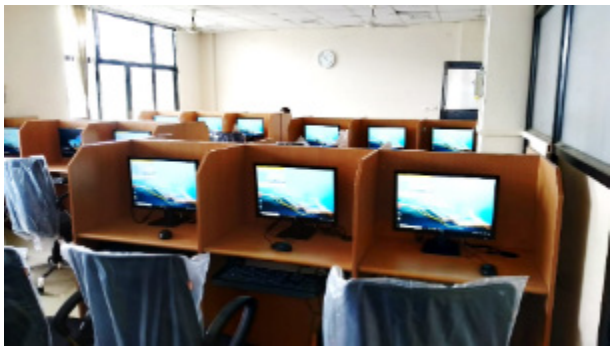
Plan ahead:

- AU is focusing on execution of certificate courses at college level
- Planning to organize an international alumnus meet in 2020-21
- Focus on completion of procurement related activities on priority basis

XIV. Central Agricultural University, Imphal

Project Title: Enhancing Entrepreneurial Competence in Students to address the emerging Challenges in Agriculture and Allied Sectors

Establishment of smart classroom, conducting online workshops on entrepreneurial initiatives, establishment of language learning laboratories are some of the key initiatives undertaken by partner AU during FY2020-21.

Exhibit: Key activities	
	
Language Lab developed under IDP-NAHEP at College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	An interactive class in progress with help of Smart Virtual classroom facility at college of Fisheries, Lembucherra, Agartala

XV. Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior

Project Title: Reinforcement of the brand Value of university for designing market ready graduates for entrepreneurship and employment generation

Partner AU has been engaged in development of smart classroom, language laboratory, industry expert lecture series during FY2020-21.

Plan ahead:

- Capacity building on governance for top level administrators & head of departments.
- Remedial courses for students
- Creation of wi-fi enabled campus
- Centralized digital monitoring System of educational activities
- Training for developing startups and entrepreneurship through incubation center and agribusiness firms
- International exposure of selected students in identified cutting edge areas
- Exposure visits to industries
- Visiting faculties from national and international institutions or industry.
- Full efforts will be made to bring the impact of the project in the institutional, educational excellence, creation of entrepreneurs etc.

XVI. Dr. Yashwant Singh Parmar University of Horticulture & Forestry, Solan

Project Title: Quality Education in Horticulture and Forestry to Generate Human Resource with Entrepreneurial Skills

Partner AU has been engaged in digitalizing the libraries, organizing industry-oriented pilot courses, entrepreneurial activities using farm demonstration units during FY2020-21.

Exhibit: Key activities-MoUs established during the period	
Name of the MoU signed	**Name of Institute/ organization/industry with whom MoU signed**
• Industrial Collaboration	Department of Industries, HP State Government
• Students' industry Internship	National Cooperative Development Corporation- NCDC
• Students' international training	West Sydney University, Australia

XVII. Sri Karan Narendra Agriculture University, Jobner

Project Title: Institutional Development Plan on Strengthening Academic Ambiance for Quality and Skill Oriented Undergraduate Education at SKNAU, Jobner

Key activities carried out by partner AU during FY2020-21

Initiative	Photograph
	
AMS (Academic Management System)	Digitization of library

XVIII. Pt. Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go-Anusandhan Sansthan, Mathura

Project Title: Institutional development plan of DUVASU for Improving the Academic and Governance system of the University for Enhancing Learning Outcome

Key activities carried out by partner AU during FY2020-21

Exhibit: Key activities-MoUs established during the period	
Name of the MoU signed	**Name of Institute/ organization/industry with whom MoU signed**
MOU between DUVASU and The Goat Trust	The Goat Trust
MOU between Veterinary University Mathura and Bikaner	RAJUVAS
MOU between Veterinary University Mathura and Jabalpur	Nanaji Deshmukh Veterinary Science University - Jabalpur

b) Component 1 B (CAAST)

I. Bidhan Chandra Krishi Vishwavidyalaya, West Bengal

Project Title: Centre for Advanced Agricultural Science & Technology on Conservation Agriculture.

Over the year, AU has utilized ~74% of the total budget released. This CAAST centre is carrying-out the activities on Conservation Agriculture (CA) thematic area. A dedicated farm has been allocated to CA activities, development of PG course on CA, organizing farmer aware programs are some of the major activities carried-out by AU

Initiatives	Brief	Photograph
Horticulture crop cultivation under conservation agriculture by BCKV, West Bengal	• Partner AU have developed various conservation agriculture (CA) such as Arecanut based cropping system: Arecanut + Carrot-Mint-Kharif onion, Mango-Arecanut based cropping system: Mango +Arecanut + Frenchbean- Amaranthus-Kharif onion, Mango based cropping system: Mango+ Guava + Berseem-Pumpkin etc. • Adoption of such methods in CA have been providing promising results in different climatic zones. • Partner AUs are also making efforts to promote such diversification in their vicinity through various field demonstrations and awareness programs for farmers	 

II. ICAR- Central Institute of Fisheries education, Mumbai

Project Title: Development of energy efficient and environment protective aquaculture technologies for degraded soils

- Over the year, AU has utilized 62% of the total budget released.
- Development of value-added products from ISW produce and waste, organizing industry exposure visits and skill development of programs, development of ICT based support systems are some of the key activities carried out by AU during the period
- The energy efficient and environment protective aquaculture technology developments were addressed through the research component of the project. The resource availability, characteristics and potential of inland saline soil and water have been delineated for Jhajjar district, Haryana and Mathura district, Uttar Pradesh.
- The dietary nutraceuticals for stress mitigation and growth enhancement of fish in inland saline water were evaluated. The major oxidative and ionic stress markers have been identified. The transcriptome analysis revealed branchial chloride channel-2 (CCL2) as a marker for potassium depletion in the rearing environment of GIFT (tilapia). The value-added products like coated shrimps, shrimp in curry, shrimp sode and shrimp in oil canned have been developed. Deproteinization of shrimp shell wastes to prepare chitin using Halophilic archaea (Halococcus dombrowskii) could be achieved upto 88% while arresting the spoilage and off odour generation.

Exhibit: Key activities

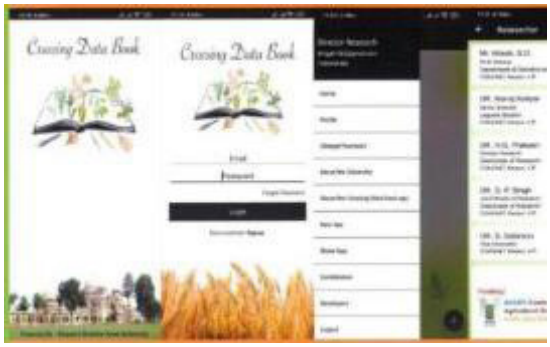


Exhibit: Key activities	
ICAR-CIFE has developed one smart classroom facility for conducting online classes for students as well as other stake-holders	Sustainable fish and shellfish production systems through stocking, harvesting and phyto-bioremediation strategies
Value-added product developed by partner AU	
 Coated shrimp	
Coated shrimps, Shrimps in curry: retort pouches, Shrimp sode, Shrimp in oil canned have been developed.	

III. Chandra Shekhar Azad University of Agriculture & technology, Kanpur

Project Title: Centre for Advance Agricultural Science & Technology on nutritional crops

- AU has utilized 55% of the total released fund till March 2021
- A sub-project focused on Nutritional Crops thematic areas has taken various initiatives during the project period. Initiatives such as organizing capacity programs for students and faculties to enhance the research effectiveness, development of market-oriented course curriculums, establishing linkages with industry and other national level organizations etc.

Digital Initiative	
Innovation	**Photograph**
Application Name: Crossing Data Book URL: htts:/play.google.com/store/apps/details2id=com.db.crossingdata This app has the following focus areas: 1. Creating the Hybridization program 2. Emasculation 3. Pollination 4. Seed Setting	

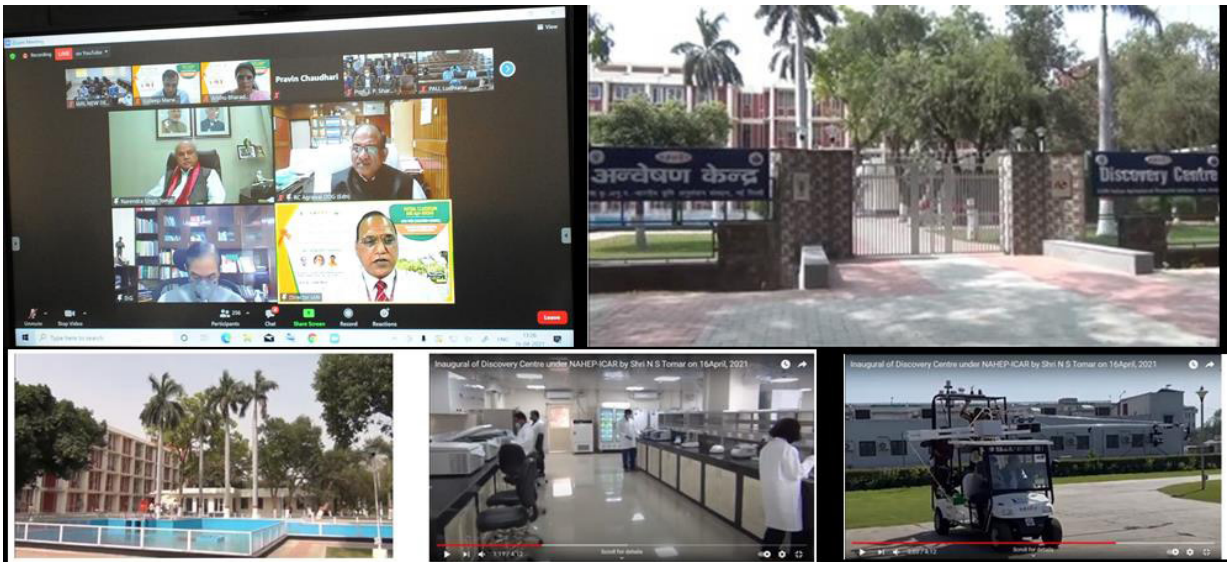
Value Added products developed by partner AU	
Innovation Product	**Photograph**
• Millets based Cowpea fortified Murukku, Pasta & Biscuit • Millets based Moringa oleifera fortified products • Murukku, Pasta & Biscuits	

Value Added products developed by partner AU	
Innovation Product	**Photograph**
• Wheat based Moong Cookies • Wheat based Cowpea Cookies	
• Ginger Candy • Karonda jam	

IV. Indian Agricultural Research institute, New Delhi

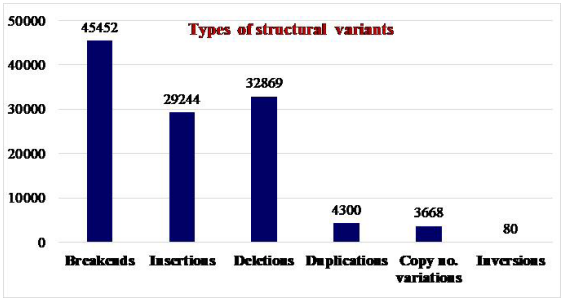
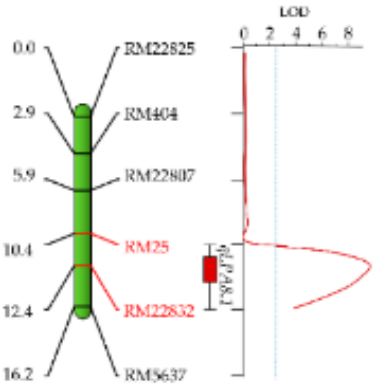
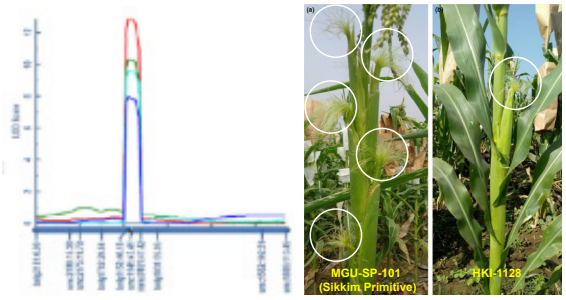
Project Title: Genomics Assisted Crop Improvement and Management

Exhibit: Key activities



Discovery Centre - a central facility for genomics and phenomics research

Genomics-aided research requires sophisticated and costly facilities. Establishment of such facility in different labs or division is expensive. Hence, common facility lab harboring essential equipment to carryout genomics and big data analytics research is required for unlimited access for the students and faculty. Currently this facility is not available in the Institute. Under the NAHEP CAAST program, genomics and big data analytics labs in the name of "*Discovery Centre*" was developed. It consists of Discovery Centre-Genomes and Discovery Centre-Drone Remote Sensing and Big Data Analytics. The facility will be useful for cutting edge post-graduate students' research in the area of genomics. In addition, "*Discovery Centre*" will serve as a center for providing hands-on training and experiential learning for large-scale skill development of students and faculty from different universities across India.

Out of box initiative by IARI, New Delhi	
De novo Sequencing of Taroari Basmati Genome India earns more than Rupees 30,000 crores annually through export of Basmati rice. Basmati rice varieties released by IARI contributed to about 95% of the basmati production and export from India. The reference quality genome sequence, a fundamental requirement for genomics assisted breeding, is not available for Indian basmati rice. Towards this *de novo* sequencing of the traditional Taroari basmati rice genome was carried out with PacBio Sequel II. Sequence analysis identified large number of structural variants. *The genome sequence will help develop climate resilient basmati rice varieties with inbuilt resistance to pest and diseases, enhanced nutritive quality and yield.*	
Mapping of the QTL for Low Phytic Acid for improving nutritional quality of rice Breeding rice varieties with a low phytic acid (LPA) content is an effective strategy to overcome micronutrient deficiency in a population which consume rice as a staple food. An LPA mutant, Pusa LPA Mutant 11 (PLM11), was identified from an ethyl methane sulfonate (EMS)-induced population of Nagina 22. The present study was carried out to map the loci governing the LPA trait in PLM11 using an F2:3 population derived from a cross between a high phytic acid rice variety, Pusa Basmati 6, with PLM11. A major QTL, qLPA8.1, explaining a 22.2% phenotypic variation on Chromosome 8 was mapped. *In silico* led to the identification of Os08g0274775, encoding a phosphatidylinositol 3- and 4-kinase gene. Since this QTL is currently specific to PLM11, the linked markers can be utilized for the development of rice varieties with reduced phytic acid (PA) content using PLM11 as the donor, thus enhancing the bioavailability of mineral micronutrients in human.	
Gene for Prolificacy in a unique maize landrace of North-Eastern Himalaya 'Sikkim Primitive' is a prolific maize landrace from North-eastern Himalayas bears 5-9 ears per plant as compared with 2 ears per plant in improved varieties. 'Sikkim Primitive' was crossed with two non-prolific inbreeds, namely, HKI1128 and UMI1200. Bulked-segregant analysis in F2:3 individuals led to the tagging of a major QTL explaining 31.7% phenotypic variation in prolificacy. Genome resequencing of parents and the lines with high prolificacy led to the identification of 6 candidate genes. *This novel QTL can be introgressed through marker-assisted selection for induction of prolificacy in elite maize, and thus enhance productivity.*	

V. Indian Veterinary Research Institute, Izatnagar

Project Title: Centre for Advance Agriculture Science & Technology on Advanced Centre for Livestock Health

During the period, one faculty has completed one-month training in UK, from April 2020 to March 2021. Whereas, under capacity building program, six students (PhD) have completed 3 months overseas training in various institutions of different countries (USA, France & U.K.).

Design and development of devices for the management of important reproductive disorders

The four designs have been developed viz., Cyst ablation device, Cyst aspiration cum ablation device, Herd animal catcher and Internal genital injection device for efficient and economical management of reproductive disorders in bovine. These designs have been submitted for registration at the Indian Patent Office for Design with the following details

Cyst Ablation Device (Design Application No. 333779-003):

Features of the technology: It is very light weight, easy to operate and used in the treatment of cystic ovarian disease in cattle and buffalo.

Ovarian cyst aspiration cum ablation device (Design Application No. 333779-001):

Features of the technology: It is portable and handy device for the treatment of cystic ovarian disease in cattle and buffalo. The main USP of this equipment is that we can aspirate the cystic fluid also which will be of immense use in the research and further development of diagnostics

Herd Animal Catcher (Design Application No. 333780-001):

Features of the technology: It is light weight, rod shape device and working on the principle of loop drop and developed for catching a particular animal in the herd.

Internal Genital Injection Device (Design Application No. 333779-002)

Features of the technology: Device developed for the treatment of bull accessory sex gland ailments and also useful in chemical sterilization of female cow. It could also be used for intra cervical injection in the cases of incomplete cervical dilation (ICD) in bovine.

VI. Mahatma Phule Krishi Vidyapeeth, Rahuri

Project Title: Centre for Advance Agricultural Science & Technology on climate smart agriculture and water management.

- **Capacity Building:** CAAST-CSAWM, MPKV, Rahuri has organized 05 International, 33 national training programmes, 16 workshops, 12 webinars, 54 experts' lectures, 07 demonstrations, 06 exposure visits benefiting 20,747 students and faculties of MPKV and 21,047 students and faculties from other agricultural universities and 4,340 farmers from Maharashtra state.
- **Certificate courses:** CAAST-CSAWM, MPKV, Rahuri has formulated the certificate courses of three weeks durations for the PG Diploma. These courses will be offered as (i) one course of three weeks, (ii) the combination of different courses of three weeks, (iii) one module of three certificate courses with or without a project or (iv) the combination of different modules. From March 2021, CAAST-CSAWM has declared the schedule of 11 standalone certificate courses (3 weeks each) and two modules (consisting of 3 certificate courses each) and completed three certificate courses on ***Organic Farming***, ***Basic Geoinformatics*** and ***Fundamentals of UAVs***. The total number of beneficiaries was 272. The revenue generated from the registration fees of these certificate courses was Rs. 4.35 lakhs.
- **Out of box research initiatives:** CAAST-CSAWM, MPKV, Rahuri developed/developed several sensors, IoT, mobile, robotics, and drone-based technologies with active inputs from the research associates and association with PG students. These developed technologies include, 06 developed Mobile and Web-Based Technologies, 07 developed IoT Based Technologies and 10 developed Drone and Robotics Based Technologies.

VII. University of Agricultural Sciences, Bangalore

Project Title: Centre for next generation technologies in adaptive agriculture

- AU has utilized 55% of the total released fund till March 2021

- Development of Next Generation Technologies on pest and disease forecasting, development of various knowledge management collaterals to such as website, mobile applications which ultimately benefits to the wider group of farmers

S.N	Category of the collateral	Brief summary	Snapshot/cover page
1	NGT Forewarning Pest and Disease	Pest Prediction & disseminating the advisory to farming community	
2	NGT-Agricultural Pest Prediction and Advisory (APPA) UAS, Bangalore	Location based Agricultural Pest Prediction and Advisory to farming community	

VIII. Punjab Agricultural University, Ludhiana

Project Title: School of Natural Resources Management for Sustainable Agriculture

- Till March 2021, total fund utilization is 80% by PAU
- Partner AU has carried out various activities such as development of market-oriented course curriculum on NRM, developed mobile applications to reduce the excess fertilizer usage, upgraded the existing machineries and technologies for effective paddy straw management, development of low-cost soil moisture sensors etc.

Technology Development
PAU-Urea Guide App: The adoption of the PAU - Urea Guide App based N management practices will substantially reduce the fertilizer N use, increase farmers' income, reduce insecticide and pesticide consumption, and also address the challenges related to air and water pollution. 

IX. Navsari Agricultural University, Navsari

Project Title: Establishment of secondary agriculture unit for skill development in students and farmers at NAU

- AU has utilized 67% of the total released funds till March 2021
- Along with the capacity building programs, guest lecture series and faculty upgradation trainings, partner AU has been keen in development of various secondary agriculture-based value-added products during the period. Some of such initiatives are placed below;

S.No.	Innovation Product	Photograph
1.	Essential oil extracted from 18 Eucalyptus clones	
2.	• Herbal Whey Beverage • Banana Paper Plate • Palm Donas	
3.	**Development of Fortified tricolour Semolina with whole wheat pasta by using food extruder:** • Bio / Naturally Fortified Pasta with beet juice was prepared under this NAHEP-CAAST sub-project. It is very rich in β-Carotene. • Spinach and Drumstick leaves are good source of Calcium and Iron content used in this product. This product is priced at Rs. 30 per 200g pack and Rs. 140 per 1 kg pack.	
4.	Semolina with whole wheat Palak pasta	
5.	Semolina with whole wheat turmeric pasta	
6.	**Wooden Candles** **Description:** Wooden Candles are being prepared by collecting the waste wood and bamboo internodes coated with eco-friendly varnish and paint. **Raw material used:** China clay / chalk powder, wooden block, sandpaper, adhesive, varnish, bamboo internodes. **Product cost: Rs. 30/-**	

S.No.	Innovation Product	Photograph
7.	**Rakhi** **Description:** This Eco-friendly Rakhi has been prepared by using wooden pieces, few NTFPs and varnish. **Raw material used:** Wooden pieces, seeds, thread, bamboo pieces, coconut holder, sandpaper & varnish **Product cost: Rs. 20 to 30/-**	

X. Anand Agricultural University, Anand

Project Title: Establishing Centre for Agricultural Market Intelligence at AAU, Anand

- AU has utilized 51% of the funds till March 2021
- During the period, price forecasting of six major crops namely wheat, groundnut, cotton, maize, potato, and cumin have been carried-out by the partner AU

Commodity	Forecasting Time	Achievement
Cumin	Post Harvesting (2020)	Prepared and published in various print media as well as on university and NAHEP-CAAST, AAU, Anand Website. **Validation- 84 to 100 per cent**
Wheat	Post Harvesting (2020)	Prepared and published in various print media as well as on university and NAHEP-CAAST, AAU, Anand Website. **Validation- 89 to 90 per cent**
Cotton	Pre Sowing (2020)	Prepared and published in various print media as well as on university and NAHEP-CAAST, AAU, Anand Website. **Validation- 88 to 100 per cent**
Groundnut	Pre Sowing (2020)	Prepared and published in various print media as well as on university and NAHEP-CAAST, AAU, Anand Website. **Validation- 100 per cent**
Maize	Pre Sowing (2020)	Prepared and published in various print media as well as on university and NAHEP-CAAST, AAU, Anand Website. **Validation- 100 per cent**
Cotton	Post- Harvest (2020)	Prepared and published in various print media as well as on university and NAHEP-CAAST, AAU, Anand Website. **Validation- 86 to 100 per cent**
Groundnut	Post- Harvest (2020)	Prepared and published in various print media as well as on university and NAHEP-CAAST, AAU, Anand Website **Validation- 100 per cent**
Maize	Post- Harvest (2020)	Prepared and published in various print media as well as on university and NAHEP-CAAST, AAU, Anand Website **Validation- 100 per cent**
Potato	Pre-Sowing (2020)	Prepared and published in various print media as well as on university and NAHEP-CAAST, AAU, Anand Website **Validation- 55-65 per cent**
Wheat	Pre Sowing (2020)	Prepared and published in various print media as well as on university and NAHEP-CAAST, AAU, Anand Website **Validation- 100 per cent**
Cumin	Pre Sowing (2020)	Prepared and published in various print media as well as on university and NAHEP-CAAST, AAU, Anand Website **Validation- 100 per cent**
Potato	Post- Harvesting (2021)	Prepared and published in various print media as well as on university and NAHEP-CAAST, AAU, Anand Website **Validation- 77-100 per cent**
Wheat	Post- Harvesting (2021)	Prepared and published in various print media as well as on university and NAHEP-CAAST, AAU, Anand Website **Validation- 100 per cent**
Cumin	Post- Harvesting (2021)	Prepared and published in various print media as well as on university and NAHEP-CAAST, AAU, Anand Website **Validation- 100 per cent**

XI. Birsa Agricultural University, Ranchi

Project Title: Standardization of Integrated Farming System Models for the State of Jharkhand

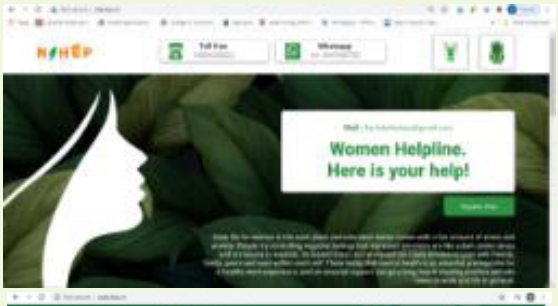
- The NAHEP – CAAST – IFS project has taken and the existing farming practices being practiced in the particular location and their constraints were identified and documented. On the basis of survey reports, various integrated farming system models viz. crop-based (1 & 2 ha model), agroforestry-based (1 ha model), pond-based (0.50 ha model, IFS for marginal farmers (1 acre model) and IFS for landless farmers have been developed, standardized and implemented for both rainfed and irrigated conditions for each agro-climatic zones of the Jharkhand.
- AU has completed 47% of the fund utilization till March 2021

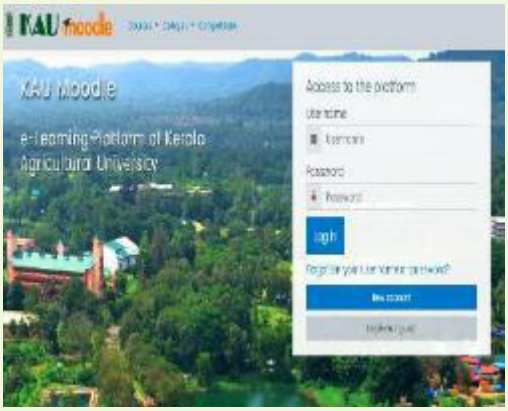
Innovation	Photograph
Initiation and Functioning of Academic Management System: Academic Management System (AMS-BAU) is a web enabled application for management of various academic activities of the Agricultural College, BAU, Ranchi.	

XII. Kerala Agricultural University, Kerala

Project Title: Knowledge and Skill Development on Coconut Based Secondary Agriculture

- AU has utilized 62% of the funds till March 2021
- Partner AU has taken various initiatives around the year on coconut and palm based secondary agriculture. AU has developed commercial production of neera sugar, standardization of Toddy and Neera powder process protocol using spray drying technology beneficial in bakery industry

Innovation	Photograph
• A women helpline website (www.she.kau.in) has been created for girl students, women labours and faculties in the university. • Idea behind this website development is to encourage the women / girls to submit their grievances without any hassles or discriminations. • Women helpline website link has also been placed at menu tab in the main page of KAU-NAHEP-CAAST website for easy access.	 

Innovation	Photograph
MIS (Management Information System) and e-learning / modules: Recently added modules under the National Skills Qualifications Framework (NSQF) • Agripreneurship development program (200 hours - Level 3) • Food Processing and Management (200 hours - Level 2)	

Type of facilitative centre	Brief	Event photograph
Start-up incubation cell	Mr. Jishnu V.G., a B Sc Forestry graduate who underwent the ELU course in the Dept. of Forest Products & Utilization was selected for a Rs 5 Lakhs grant under **RAISE (Realizing and Augmenting Innovations for Start-up Enterprises)** for his ideation to establishment of an agri start up around COCONUT FIBRE CEMENT BOARD (CFCB), a low cost housing panel.	
Infrastructure	Established an advanced research lab for PG students and faculty research in biotechnology; Coconut inflorescence sap (neera) processing unit, Coconut Food Pro Mall, Coconut wood workshop as demonstration centres for training entrepreneurs and FPOs in commercialization of food products from coconut; Advanced facilities in KAU - Agri Business Incubator for training and handholding of entrepreneurs	

XIII. Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya, Palampur

Project Title: Protected Agriculture and Natural Farming

- AU has utilized 71% of the funds till March 2021
- Eighteen Trichoderma isolates were evaluated against the Ralstonia solanacearum and isolates TI-6 and TI-9 were found to be most effective resulting each in 2.50 cm inhibition zone followed by TH-5 (2.00 cm).Water extract of the botanicals (Eupatorium spp., Euphorbia spp., Darek (Melia azedarach),

Lantana camera and Ajuga spp.) were found ineffective even at 100 per cent concentration whereas alcoholic extract of Eupatorium, Euphorbia and Darek (Melia azedarach) showed inhibition zone at 50% concentration.

S.No.	Innovation Product	Photograph
1	**Production of bio formulations, bio-fertilizers and compost liquid manures:**	
2	**Development of environmental control for protected cultivation using alternate sources of energy**	

XIV. Vasantrao Naik Marathwada Agricultural University, Parbhani

Project Title: Centre of Excellence for Digital Farming Solutions for Enhancing Productivity by Robots, Drones, and AGVs

- AU has utilized 57% of the funds till March 2021
- Establishment of smart classroom facilities, procurement of mechatronics, 3-D printer machines and developed innovative laboratories to create Agribots, Agri AGVs, organizing capacity and skill development training programs for student and faculties, organizing national level competitions etc. are some of the key activities carried out by pattern AU

S.No.	Innovation Product	Photograph
1	**Cotton Picker Machine**	

S.No.	Innovation Product	Photograph
2	**Multi-Functional Solar Sprayer Robot:** • The robot is designed to move in both the directions with the help of 4 wheels - 2 small and 2 big wheels. The combination of small and big wheels provides the stability to the robots on the field. • The IoT based camera is mounted for monitoring and addressing, both voice and video signals are continuously being transmitted on the 4G communication network for remote visualization. • V380 is an android application which is used for live field monitoring. • Necessary energy requirement of the robot is fulfilled by the battery mounted on the robot. The battery can be charged through the solar panel mounted on the robot or electrical supply.	

AUs awarded under CAAST - Call 3

During Call 3 award, CAAST sub-projects have been awarded to 2 AUs. Recently, PIU-NAHEP has released the funds to respective AUs. As the project progress, activities and achievements from these AUs will be more visible.

Here is the list of AUs and project title

Name of the AU	Project title
I. JNKVV, Jabalpur	Skill Development to Use Spatial Data for Natural Resources Management in Agriculture
II. MAFSU, Nagpur	Centre of Excellence for Advanced Research on Animal Food Safety

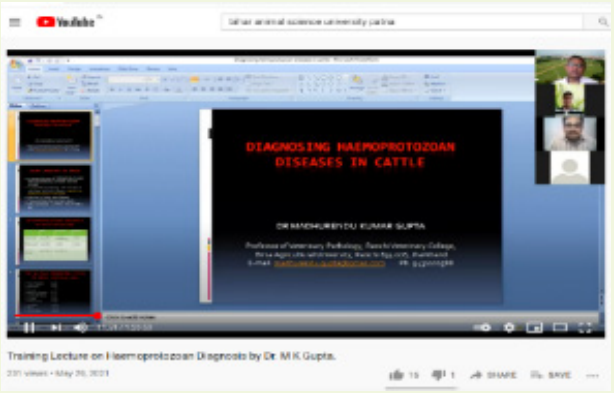
c) Component 1 C (IG)

I. Bihar Animal Sciences University, Patna

Project Title: Proposal for Innovation Grant under NAHEP

During the period, International Project sanctioned on "Promote Sustainable Livestock Production" due to international linkages developed under NAHEP by Australia-India Council Grant 2020 through Melbourne University. Two smart lecture halls renovated and made functional. Three faculty members from Bihar Veterinary College, BASU successfully completed International Training in USA and New Zealand. Fund utilization was completed as per schedule and all financial reports submitted well in time.

Exhibit: Key activities

<table>
<tr>
<td> 
</td>
<td>  </td>
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<tr>
<td>Online webinar/ Seminar recordings are being upload on University you tube Channel under NAHEP for wider dissemination of information</td>
<td>Workshop on "Canine grooming and Spa</td>
</tr>
</table>

II. Dr Panjabrao Deshmukh Krishi Vidyapeeth, Akola:

Project Title: Capacity building and skill development in renewable energy

- Keeping in view the objective to develop skill as well as capacity building of students and faculties the various activities like Brain storming e-workshop, industry -institute e-meet, e-trainings (National), e-conference (National), e-trainings for students (in-plant training and summer training), Two-weeks e-training for student regarding preparation of competitive examinations like AIEEA/AICE/ICAR, online debate competition for undergraduate students, National e-workshop for students on personality and leadership development were organized to enlace the skills of the students and faculties.

- The various activities were organized for the faculty as well as for the students. These activities have arranged with the main emphasis on capacity building and skill development in renewable energy. During these programs for student's various renewable energy-based prototypes, its use and necessity, its design development were discussed at length and online demonstration of the systems were shown wherever necessary. Hence the awareness, was created about the renewable energy technology-based entrepreneurship and its utilization in agriculture and for domestic sector. The participants from various disciplines of agricultural science were participated in the various training from all over the country. The concept of entrepreneurship opportunities and development in renewables as well as in agriculture has been percolated in students through faculty members

Exhibit: Key activities	
	
The biogas-based electricity generation system developed under NAHEP at University Dairy, Dr. PDKV, Akola. The biogas of 50 m3 run successfully & electricity is being supplied to dairy barn	Renewable Energy Fabrication Lab established at partner AU

III. Maharana Pratap Horticultural University, Karnal

Project Title: Research-cum-Technology transfer centre on protected cultivation

- MHU, Karnal has been provided grants under innovations grant component (IG) under the component Goods & equipment and office equipment subcomponent Hi-tech Poly house, Furniture & fixtures, computers & peripherals, digital e-text books etc.
- It shall help the University in infrastructure development and also the facilities of Smart Classroom and capacity building component where the students and faculty of the University shall have the opportunity to get international trainings which shall help in professional skill development establish linkages with foreign universities for future opportunities/international exposure to globally recognized institutes.
- The students shall become aware about the market-oriented academics/courses curriculum and making students ready to meet industry needs & their suitable placement. Presently, the University being in establishing stage the results are not visible immediately as the academic session for the undergraduate students started recently for the current academic year (2020-21). In the long run the benefits in imparting quality education to its students shall be reflected in future.

Exhibit: Key activities	
	
The book entitled "*Bharat me prachlit mushrrom ki unnat utpadhan taknik*" authored by Dr. Ajay Singh, Dr. Manjeet Singh, Dr. Ved Prakash Singh was published during 2020-21	Hi-Tech Green House with Retractable Roof established at MHU RMRC, Murthal (Soniepat), MHU Research Farm, Anjanthali (Karnal) & MHU RRS, Raiya (Jhajjar)

IV. PV Narsimha Rao Telangana Veterinary University, Hyderabad

Project Title: Modernization of Veterinary Clinical Complex and Establishment of Veterinary Diagnostic & Feed Analytical Laboratories

Road map that was approved for the year 20-21 was successfully implemented by completing the procurement of the approved laboratory equipment. During the year we have procured 26 different diagnostic and laboratory equipment with which we have completed the procurement process.

With these facilities able to provide an early but accurate diagnosis for many systemic and infectious diseases of livestock and companion animals. The facilities also provide a better practical exposure in the form of hands-on training experience for students. Faculty are utilizing these facilities for quality research.

The following diagnostic kits were developed and standardised:

1. Development of polymerase spiral reaction assay as point of care pen side diagnostic test (standardisation of the assay were done with the available virus in our lab and those that are significant in the field conditions)

* *Bluetongue virus (BTV) (ds RNA virus)*
* *Canine Parvo virus (CPV) (ssDNA virus)*
* *Canine Adeno virus (CAdV) (DNA virus)*
* *Canine Corona virus (CCoV) (ss RNA virus)*

2. Development of NS1 recombinant protein based Indirect-ELISA for serodiagnosis of BTV (*to standardise and develop an in-house recombinant protein-based ELISA kit for BTV)*

Exhibit: Key activities

Trainings and Demonstrations: Students and research scholars working with inhalant anesthesia machine

Establishment of Feed Analytical Laboratory helped the real needy people, farmers to have a quality feed for their animals and learned to follow food safety measures

V. Swami Keshwanand Rajasthan Agricultural University, Bikaner

Project Title: Proposal for Innovation Grant under NAHEP

- During FY 2020-21, total eleven training programmes on important aspects of agriculture and allied sectors were conducted to sharpen entrepreneurial skills among students and rural youth including farmers and farm women, where total 487 participants were benefitted. Two national webinars on "Strategy for Strengthening Agricultural Education under Changing Scenario of COVID-19" and "Intellectual Property Rights in Agriculture Sector" and one national e-workshop on "Current Scenario of Post-Graduation Research in Agriculture Sector" were conducted where total 7565 students and academicians from different parts of the country were registered. An awareness programme on Agricultural Education Day also organized in two different schools located near Pakistan border area of Bikaner with the theme carrier opportunities in agriculture and allied science.
- Online English Learning Language Lab for holistic development of students; Anti-plagiarism software to enhance the level of research, avoid plagiarism and also to encourage academic ethics and integrity among students; and learning management software's were also subscribed to develop academic competence among students during lockdown situation. A separate website for National Agricultural Higher Education Project of SKRAU Bikaner has also been developed. College library was enriched with the purchase of required books and journals.
- Sanitary napkin wending machine in female toilets have been installed under environmental and social safeguards. A video-conferencing system has been installed in Vice-Chancellor's secretariat to facilitate participation in online academic programs and conduct of online meetings. Laboratory equipment,

glassware and laboratory chemicals were also purchased to facilitate student research. Farm implements have also been purchased to facilitate farm operations for research and seed production programme.

VI. Kamdhenu University, Gandhinagar

Project Title: Making Kamdhenu University, College of Dairy Science, reform ready for accreditation

- AU has been accredited after the intervention of NAHEP.
- Activities like modernization of UG/PG labs, classrooms, digitization of libraries, capacity building programs etc. were the activities supported for securing better grade in ICAR accreditation

S. No	Initiative	Brief
1	Nanotechnology based dipstick for the instant detection of milk adulterants	• College of Dairy Science, Kamdhenu University, Amreli has developed "**Nanotechnology based dipstick for the instant detection of milk adulterants"**. • IPR has also been filed for this innovative technology • Technology transfer process has already been initiated

VII. Agricultural University, Kota

Project Title: Innovation plan for hi-tech Horticulture

- Under this component, projects have been awarded to select participating AUs to attain accreditation. Reform ready AUs mentoring the non-accredited AUs have also been considered in this component.
- Strengthening of existing hi-tech horticulture, establishment of pilot hydroponic / aeroponic unit and modernization of existing facilities like classroom, laboratories and instructional farms for smart teaching and hands on training for scaling up learning are the broad activities. Under these activities hydroponic unit has been strengthened with 24 vertical towers and 4 A-frame structures. These naturally ventilated polyhouses have been renovated. Laboratory and instructional farm have also been modernized with advance equipment facilities like automatic temperature, RH and light controller, lux meter, seed sowing machine and platform weighing machine and drip irrigation facility in 8 ha area.

VIII. Rani Lakshmi Bai Central Agricultural University, Jhansi

Project Title: Strengthening teaching – learning ambience for excellence in academic, research and extension

- Precision/Model Research Farm (50 acres) developed by laser leveling and Modern farm machineries for different farm operations have been purchased. For students learning and research three modern laboratories viz., Plant Pathology, Genetics and Plant Breeding, and Agronomy and have been established besides E-Library having 40 desktop computers established for the UG and PG students and faculty. E-resources are being shared with students and faculty regularly. University library have purchased books worth Rs. 11 lakhs.
- Established cafeteria for students learning and exposing farmers of the region to new varieties/hybrids: Newly developed varieties/hybrids of major oilseed (sesame, mustard, groundnut, linseed), pulses (chickpea, lentil, mungbean, urdbean, pigeonpea, cowpea), cereals (wheat and barley), and coarse grains (pearl millet, sorghum, kodo millet & barnyard millet and pseudo cereal (amaranths, quinoa) collected and grown. Fruits Orchard & Flowers Cafeteria established. Also established seasonal cafeteria on major crops and vegetables of the Bundelkhand region. Huge collection of germplasm accessions of wild (chickpea, sesame, linseed and mustard) and cultivated species (chickpea, mungbean, urdbean mustard, sesame and linseed) from different sources (NBPGR, ICAR Institutes, SAUs, and CGIAR Institutes etc.) has been done. Developing Integrated Farming System (IFS) Module on 1.0 ha farm area –organic production of crops and vegetables (vermicomposting unit established). Massive plantation (in more than 3 ha area) and around newly constructed academic and administrative building besides roadside has been done. Biodiversity Park having 42 tree species of economic importance has been established.

Ensuring recycling of crop and plant residues through vermicomposting (from 100 acres land) and ponds for rainwater harvesting created.

IX. University for Agricultural Sciences, Raichur

Project Title: Digitization of Library for information services to strengthen and develop competitive human resources at agricultural university

- UAS, Raichur is sanctioned a project on "Digitization of Library for Information Services to Strengthen and Develop Competitive Human Resources at Agricultural University" under ICAR-NAHEP-IG and being successfully implemented since 2019. Under the project, UAS, Raichur is sanctioned Rs. 499.95 lakh for developing the library as "Knowledge Hub" and to serve the students and faculty with required and adequate information on various technical subjects. Overall, the project aims to strengthen library with e-Resources and digitization and also developing competitive human resources in the University. During the year 2020-21, the targeted and issue-based programmes have been successfully completed. During FY 20-21, many activities have been conducted to achieve the objectives, major ones are: exposure visits (4 Nos), seven webinars, eight training programmes, six workshops and one national conference under the project. Nearly 5038 students and faculty participated in various programmes and gained the usufructs of the project. Among these trainings and workshops, high impetus has been laid on enhancing soft skills, improving operational efficiency, encouraging quality research writings and use of ICT based tools in teaching and learnings and also emphasis on building entrepreneurship capabilities of students in university. Moreover, exposure visits and skill development programmes have also been organized to develop linkages with agri based industry and enable the students to start their own Agripreneurship.
- Besides these, major digital infrastructure activities under the project, established RFID based Digital Library System, Kindle library for smart reading and English Language Lab at Libraries of College of Agriculture, Kalaburagi and Bheemarayanagudi. It enabled self-circulation and self-return of issued books besides improved security system. It also facilitated an easy access for students to read online and pre-loaded e-books and other digital resources that helped in improving communication and presentation skills. It also facilitated NAAC accreditation process of the University. One of the objectives is to get accreditation, since the University got accreditation of the constituent Colleges namely CoA, B'Gudi and Kalaburagi: The University has entered out the process of NAAC accreditation as suggested by the world bank review team. University library is also strengthened with e-resources like agriculture e-books, Turnitin Plagiarism Software, Grammarly SSPS statistical software, Myloft remote access system and Indiastat subscription for easy access of various e-resources to the students and faculty of the University to develop competitive human resources. Another highlight of NAHEP-IG Project of UAS, Raichur is maximum financial utilization (79.12%) and highest Procurement Progress (97.91%) during FY 2020-21 despite Covid-19 pandemic

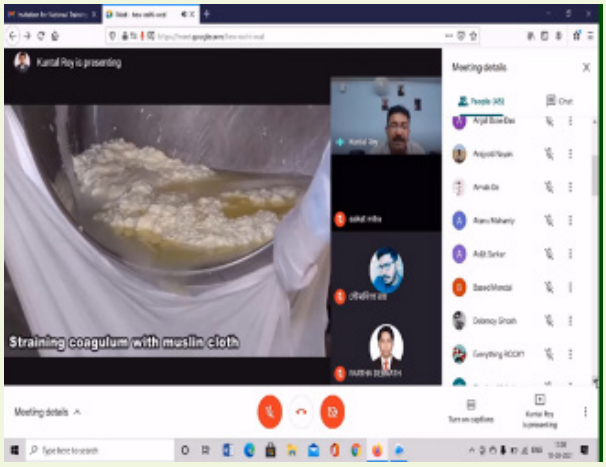
X. West Bengal University of Animal & Fishery Sciences

Project Title: Strengthening Post Graduate Education and Outreach Programmes at faculty of Dairy technology, west Bengal university of Animal and fishery sciences, Kolkata, West Bengal

- The current project was taken up with an aim to strengthen the Post Graduate Education at the Faculty of Dairy Technology, West Bengal University of Animal and Fishery Sciences along with providing training and skill development facilities to the farmers and young dairy entrepreneurs through outreach programmes. Infrastructural development of the faculty was one of the major objectives fulfilled during the financial year 2020-21. About 15 different Laboratory instruments and equipment were procured for upgrading central laboratory facilities and incubation centre of the faculty. A 30 seated smart classroom and a 50 seated training hall equipped with multimedia facilities were developed. A solar panel of 5 KW was installed on the rooftop of the faculty building for effective energy savings. In the academic block of the faculty building, existing tubes and bulbs were replaced by energy- efficient lights. As an out of the box activity, an initiative has been taken to develop a clean and green campus around the faculty building at Mohanpur, Nadia.
- Under the COVID-19 global pandemic situation, capacity building programmes for faculty members and postgraduate students were accomplished partially through virtual mode. Virtual lecture sessions on

different technical aspects of dairy food processing, food safety, packaging innovations, biotechnological advancement, engineering innovations by eminent personalities from the abode and abroad were arranged for knowledge enhancement of the students and faculty members

Exhibit: Key activities



Institute of Dairy Technology organized 2 online training programmes for socially backward people and women

Repair and Renovation of one 50 seated training hall and one 30 seated smart classroom was accomplished.

XI. Sri Konda Laxman Telangana State Horticultural University, Hyderabad

Project Title: Strengthening of College of horticulture, Mojerla for attaining ICAR Accreditation

Trainings under Human Capacity building: During FY 2020-21 financial activities mainly focused on teaching and research infrastructure development, faculty development trainings, personality development for students, networking, research collaboration, e- enabled learning activities and students job placement. Till March 2021, nearly 162 students and 23 faculty of Horticulture college and allied departments have undergone national level trainings in reputed research institutes, whereas one workshop on "Student Empowerment for Competitive Examinations" have been organized for UG level students under Capacity building programme. Among these trainings and workshops, high impetus has been laid on enhancing employability and building entrepreneurship capabilities of Horticulture students, so that the ripple effect of program in society could be created. Moreover, industry visits and Skill development programs have also been organized majorly to cater the current market needs and enable the students to emerge as "Job Creators" rather than "Job Seekers".

Establishment of Instructional farm: New Instructional farm was established at Madanapuram in close proximity to college with the financial aid of NAHE project. During 2020-21 plantation was done with the drip irrigation facilities in the newly established fruit plantation and vegetable blocks in 12 acres. Mango, Guava, Fig and Pomegranate, vegetables blocks were established with the support of skilled manpower engaged under NAHE Project. All the farm operations such as land clearing, ploughing, digging of pits, bed making mulching etc. were carried out with tractor and tractor drawn implements purchased with project such as Mould board plough, Mulch laying machine, Post hole digger, leveller, Bed maker etc.,

Strengthening of Library facilities: Digital library and language laboratory were established. Books and journals were purchased as per the revised syllabus. Twenty new computers were purchased under NAHEP for newly establishment language lab and digital Library. A Server was purchased for file and network security, centralized data storage for college. In order to establish a fair and transparent system, while effectively addressing the grievances of project stakeholders, a 3 tier Grievance Redressal Mechanism has also been established at College under NAHEP and has been made fully operational during FY 2020-21.

It is worth mentioning here that, during November, 2019 College has attained ICAR accreditation due to NAHEP financial support and interventions.

XII. Professor Jayashankar Telangana State Agricultural University, Hyderabad

Project Title: National Knowledge Management Centre for Agriculture Education and Research

- Digital technologies and online access to information resources have brought increased expectation from library and information services. For researchers, timely and fast access to existing scientific outputs and archived scholarly information on his/her topic of interest is as crucial as current scientific knowledge. The modes of services that librarians and information professionals provide has thus become very important and have undergone fundamental changes over past few decades. Digital resources, digital services and access technologies continue to create new opportunities, new challenges and new expectations. Union catalogue, digital repository and digital libraries are the new paradigms which have been taken up under e-Granth initiative to facilitate researchers, teachers, students, extension professionals for a limited number of universities. These facilities should be extended in more efficient and effective manners.
- Therefore, National Knowledge Management Centre For Agricultural Education & Research (NKMC4AER) is proposed to innovate and execute newer developments for efficient use of modern platforms of digital knowledge. The NKMC4AER will continue to strengthen the digital platform for NARES repositories under various agricultural libraries of the universalities.

Sl. No	Innovation	Photograph
1	**Application developed (Mobile/Web based)** • Designed and Developed Mobile App for Library and Knowledge Management • Through this application, students can search a particular Book in the Library while using keywords like Title, Author, Subject.	
2	MIS (Management Information System) / FMS (Financial Management System)	
3	**Digitization of library** Implementation of Koha Integrated Library Management Software (ILMS) and Customization of Online Public Access Catalogue (OPAC) in 06 SAUs and 01 ICAR Institution.	

Sl. No	Innovation	Photograph
4	**e-learning / modules developed** • Developed an e-learning platform for launching of MOOCs on **"Information Handling Skills for Teaching, Learning and Research".** URL: http://mooc.nkmcaer.pjtsau.edu.in. • Developed 15 Digital Video Contents on various topics of Information Handling Skills for Teaching, Learning and Research. • Established centralized platform for providing cloud service to NARES libraries & to enable them to use Koha for their library operations and local user services at ICAR-IARI.	

XIII. Sri Venkateshwara Veterinary University, Tirupati

Project Title: Innovation Grant proposal

Digital Studio was established with latest multimedia modules for Preparation of short videos on various animal husbandry activities at Centre for continuous veterinary education, SVVU,Tirupati. Strengthened Livestock Research Station, Palamaner into a modern post graduate research center at Livestock Research Centre, Plamanaer. Established virtual dissection lab at Department of Veterinary Anatomy, College of Veterinary Science Tirupati. Five smart classrooms were established in Various constituent colleges of SVVU i.e at College of Veterinary Science Tirupati, College of Dairy Technology, Tirupati, College of Veterinary science, Gannavarm, College of Veterinary Science, Proddatur and College of Fishery science, Muthukur.

Initiatives	Brief	Photograph
Development of Virtual Dissection of Ox/Cow by SVVU, Tirupati	• Partner AUs have been consistently upgrading the Virtual Dissection tool for more various species and animals. • AU has recently developed the simulation modules for Anatomy and surgical procedures for Ox and Cow	

XIV. Agriculture University, Jodhpur

Project Title: Innovation grant under NAHEP for Strengthening of Agriculture University, Jodhpur for Accreditation

Training program conducted under NAHEP includes Women Health-Hygiene & Wellness which was organised for all the female students and staff members of the University. In this training program more than 15 special guests were invited from different fields, and all the participants got valuable knowledge from the dignitaries and also were inspired from their life lessons. In this training program students were also facilitated from a brainstorming session in which a metaphor therapy was done by the special team. All the female students undergone blood sampling and results. Students got a medical kit specially related to their health and hygiene. Online learning courses were implemented for students like English learning tools, course eBooks & journals etc. which helped them to learn even in this current pandemic situation. Various online competition program were conducted for students like poster making competition, essay writing competition, quiz competition etc. to bring out the talents and give them a platform for their talents. These competitions include a national level essay and poster making competition in which all the students of agriculture university of India were invited to take part in the competition. We got more than 1000 entries

and the winners awarded with the prizes and certificates.

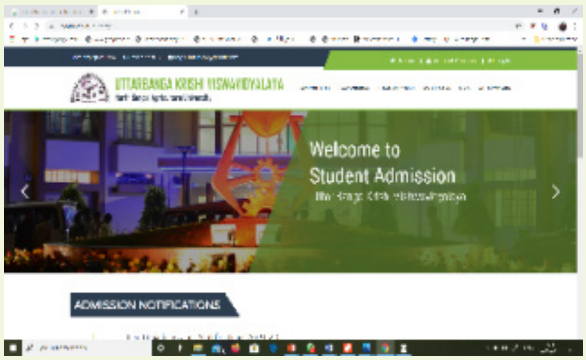
XV. Acharya Narendra Deva University Of Agriculture And Technology, Kumarganj, Ayodhya

Project Title: Strengthening and modernization of Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya to make the University ready for accreditation

Exposure visits	
Visit to Lucknow Zoo	 
Visit To Central Institute of Subtropical Horticulture	
Visit of Students to Amul Milk Plant, Banas Dairy	
Visit of community science students to different institutes	

XVI. UBKV, West Bengal

Project Title: Smart curricula delivery through virtual classrooms as communication Linked Interface for Cultivating Knowledge and online courses

Brief	Photograph
	
Leveraging the intellectual excellence beyond boundaries of a classroom/ conference room through creating facilities of Virtual Classroom/Smart Classroom	Successfully completed online admission and counselling of student year 2020-21

XVII. Dr. Rajendra Prasad Central Agricultural University, Pusa

Project Title: Automation of University activities and digitization of the documents

- Digital Smart Podiums: These systems have been installed in all the classrooms of different colleges which are being used by the course instructors for delivering the off line as well as online lectures. Majority of the lectures are delivered through Power Point Presentation (PPT). These Podiums have multiple built in features like video lectures, lecture recordings, etc. Also, these are connected with high-speed internet connection which helps d nd Ph.D. students have been conducted online using Cisco-Webex/ Google Meet platforms. This has resulted in saving of a lot of time of the faculty, experts and students
- All the new academic/ administrative buildings of the university have been connected to LAN of the university and some of the old buildings with poor connectivity (RF Channel) have been provided with OFC connectivity

The new campus of the university at Piprakothi (East Champaran) is being provided with LAN with latest technology

AUs awarded under IG – Call 3

IG – Call 3 sub-projects have been awarded to **10 AUs / colleges.** Recently, PIU-NAHEP has released the funds to respective AUs. As the project progress, activities and achievements from these AUs will be more visible.

Here is the list of AUs and project title

Name of the AU	Project title
I. **Dr. RPCAU, Pusa, Samstipur, Bihar**	Automation of University activities and digitization of the documents
II. **VCSGUH&F, Bharsar, Uttarakhand**	Strengthening of VCSG Uttarakhand University of Horticulture and Forestry, Bharsar
III. **IGKV, Raipur, Chhattisgarh** a. **College of Agriculture and Research Station, Janjgir – Champa** b. **DKS college of Agriculture and Research Station, Bhatapara** c. **College of agriculture and Research Station, Bemetara** d. **College of Agriculture and Research, Raigarh** e. **College of Agriculture and Research station, Korea**	Creation of Facilities and Modernization of the College.

IV. **SVPUA&T, Meerut** **a. College of Veterinary and Animal Sciences, SVPUAT, Meerut** **b. College of Biotechnology, SVPUAT, Meerut**	Institutional capacity building leading to accreditation of colleges
V. **KV&ASU, Wayanad** **a. College of Avian Sciences and Management, Thiruvazhamkuunu, Palakkad**	CASM (under KVASU) - Proposal for ICAR Innovation Grant under NAHEP
VI. **CKV, Kawardha** **a. College of Fisheries, Kawardha,**	Upgradation of Academic and Research Facilities of College of Fisheries, Kawardha.
VII. **NDVSU, Jabalpur** **a. College of fishery Science, Jabalpur**	Innovation Grant under National Agricultural Higher Education Project for Strengthening of College of Fishery Science, Nanaji Deshmukh Veterinary Science University, Jabalpur (IG)
VIII. **RUV&AS, Bikaner** **a. Post Graduate Institute of Veterinary Education and Research, Jaipur** **b. College of Veterinary and Animal Science Navania, Vallabhnagar, Udaipur**	Establishment and strengthening of livestock innovation, knowledge, entrepreneurship, skill centre for accreditation

C. Success stories / Case studies / Out of box initiatives undertaken by partner AUs

a) Success stories under the component

Documentation of success stories are useful for disseminating the focus of the innovative projects, outcomes and impacts on the beneficiaries. Through this dissemination methodology, the stakeholders of the project have been encouraged to share their experiences of implementation process that led to better or satisfactory results.

Name of the institute: Junagadh Agriculture University, Junagadh (Gujarat)

Success story

Establishment of an agri enterprise "Techno Chem": Setting the entrepreneurial mindset through NAHEP

Mr. Bhavesh Solanki, graduated student from College of Agril. Engg. & Technology, JAU has established his own startup, Techno Chem at Vapi, Gujarat. Techno Chem is an agri based firm, which deals with laboratory Chemicals, laboratory instruments, lab glassware, Plastic ware, silica ware, lab metal ware, rubber ware, lab safety products, commercial grade chemicals, ETP Plant Materials, membrane filter paper, water testing kit etc.

During final year of UG, Bhavesh participated in various entrepreneurial promotion initiatives and training programs conducted by JAU, Junagadh. Distinguished guest lectures of innovators / new age agri startups organized by JAU motivated and helped Bhavesh in building the entrepreneurial capabilities in agriculture and allied sector. Prior to starting his own firm, he gained hands- on experience with select reputed firms such as Rankem, Merck, Thermo Fisher, Labline and Whatman. Bhavesh expressed his sincere gratitude to the university and NAHEP- IDP for the opportunity to get associated and benefits he has received from the program.

Agricultural Equipment enterprise "Kisan Agritech": Setting the entrepreneurial mindset through NAHEP

Mr. Nikunj Vegad, who graduated in 2019-20 from College of Agricultural Engineering and Technology, JAU, Junagadh has started his own agri enterprise, M/s. Kisan Agritech which deals majorly with agricultural equipment retailing. While pursuing UG at JAU, he attended various industry-oriented lecture series hosted by JAU under NAHEP. Constant interactions with experts from the industry and the industry-oriented training programs helped and motivated Nikunj to establish his own agri based enterprise, right after he completed his UG degree. Nikunj expressed his sincere gratitude to JAU and NAHEP - IDP for capacitating him while enhancing his inter-personal & professional skills, industry orientations, helping him to better understand market needs and augmenting his entrepreneurial capabilities.

Name of the institute: G. B. Pant University of Agriculture & Technology Pantnagar, Uttarakhand

Success story

Selection for postgraduation in Humboldt University, Berlin, Germany: Improved learning outcome through NAHEP

During last one year, GBPUA&T has conducted various training programs for Under-graduate students under NAHEP- IDP. Among these programs, Certification based foreign language classes were also being conducted on a regular basis to acquaint students on German and French language along with advance English communication classes. So far, a total 400 hours of language classes have been conducted for ~230 student beneficiaries.

Among these students, Ms. Kritika Chauhan got selected for the Humboldt University to pursue her postgraduation in agriculture. It happened mainly due to her understanding of German language (which she learned during NAHEP- IDP certification programs), in addition to requisite academic and technical qualifications.

Name of the institute: Sher-e-Kashmir University of agriculture science and technology of Jammu (Jammu and Kashmir)

Success story

SKUAST-Kashmir bags prestigious 'India Innovation Growth Programme IIGP-2019 award

SKUAST-K ranked amongst top 10 institutes along with the IITs and BITS Pilani in IIGP 2019. IIGP-2019 competition took place in two phases with the final presentation at IIT Bombay.

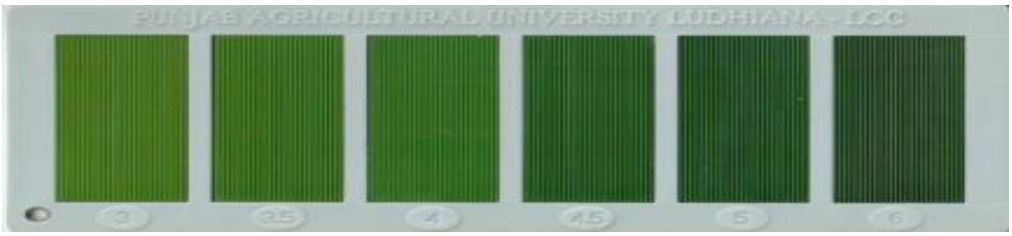
Dr. Hamadani, a faculty from university and one of the beneficiaries of NAHEP - IDP presented an innovative idea on **"Artificial Intelligence driven Farm Management Information System"** during the competition. The AI driven tool presented by Dr Hamadani has the potential to directly connect the farmers with the development agencies, R & D institutions and other key stakeholders for real-time data collection and service delivery to the farmers. The output provided through this application will help farmers for better management of the farms with customized support services. Over and above this, such AI driven tool could serve as an effective market research and e-governance tool for government to facilitate in decision making processes.

Component 1b: Centres for Advanced Agricultural Sciences and Technology

Name of the institute: Punjab Agricultural University, Ludhiana (Punjab)

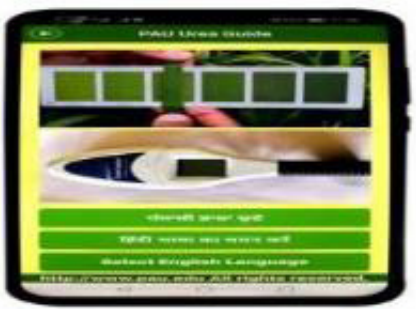
Success story

PAU's Urea Guide Mobile Application: Has potential to achieve an estimated economic savings of INR 7.5 billion in Punjab annually



- Department of Soil Science, PAU has developed the PAU - Leaf Color Chart (LCC) in 2017. Going forward, the further research activities, field demonstrations and promotion of this innovative technique are now being undertaken through CAAST support.

- PAU-LCC chart application recommends the farmers on the usage of fertilizers and pesticides on the basis of leaf color combinations.
- Initially adoption of this LCC chart was at slower rate with specific villages like Bassian in Ludhiana.
- Post intensive field demonstrations and marketing campaign for PAU-LCC, the adoption rate has significantly improved.
- Now, most of the farmers from Bassian have been using these charts while application of fertilizers and pesticides, which has resulted into precise application of fertilizers and has reduced the excessive usage of fertilizer and overall input costs.



- The use of PAU - LCC has led to an equivalent grain yield with an average saving of 50-80 kg N per hectare in Rice and 50 kg N per hectare in wheat in comparison with the farmers' usual practice.
- According to the estimates prepared by PAU scientists, the adoption of PAU - LCC in all the fields of rice, wheat, maize and cotton in Punjab alone has potential to save INR 7.5 billion costs of farmers annually. The savings on expenditure of insecticides / pesticides would help in doubling the farmers' income.

Name of the institute: Birsa Agricultural University, Ranchi, Jharkhand

Success story

Adoption of Integrated Farming System (IFS) has significantly improved the livelihood of Mr. Anuj Kumar, Gaya, Bihar

- NAHEP awarded sub-project at BAU, Ranchi has been working in one of the emerging areas of agriculture and allied sciences i.e., Integrated Farming System (IFS) since last two years. Scientists from BAU has been engaged in promoting IFS practices through various activities such as *awareness workshop, orientation workshops for farmers and other stakeholders at village level.*
- With the support from NAHEP – CAAST, one of the beneficiary farmers Mr. Anuj started integrated farming on a land area of 5.0 acres. He was growing field crops like *Paddy, Wheat, Rapeseed, Pulses, Fodder crops and Vegetables in 4.5 acres in all the three seasons since last one and half years.*
- Whereas, on the remaining piece of land *(0.5 acre), he has been rearing and managing 543 ducks (Khaki Campbell & Indian Runner Breed), 250 poultry birds (Sonali Hen), 1500 quails, 3 cattle (cross-bred) and 10 goats (Black Bengal).* He has also established a vermicompost production unit with a capacity of 1 ton per month and a 4-layered fishpond with the production capacity of 1000 fishes of 90 days cycle.
- Post adoption of this IFS method of farming, Mr. Kumar is getting more yield per unit area per unit time by virtue of high crop canopy, better crop rotation and additional income from allied enterprises while utilizing the on-farm inputs properly on an economic and sustainable basis.
- It is also important to note that due to adoption of IFS, he is also realizing the income at regular intervals as well as can afford the nutrition balance for his family throughout the year.

Name of the institute: Navsari Agricultural University, Navsari

Success story

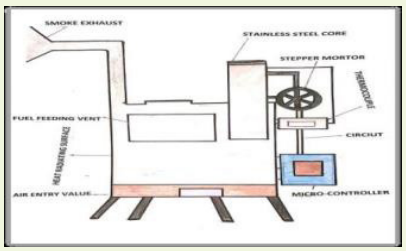
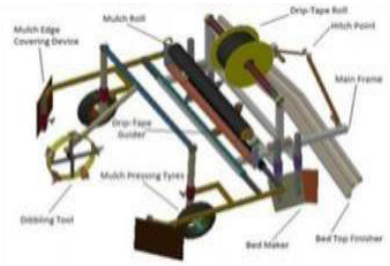
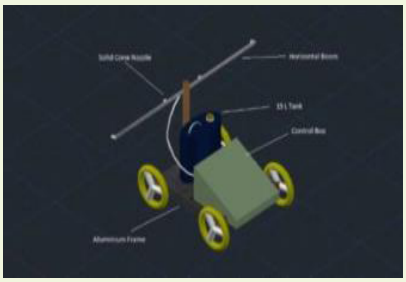
'Novel' Organic plant booster developed by NAU scientists' controls pests and diseases in a sustainable manner

- 'Novel': A banana pseudo stem based organic liquid nutrients has been introduced by scientists of NAU, Navsari. This product contains N, P and K as well as other micro-nutrients such as Ca, Mg, S, Mn, Cu, Zn, Fe etc. in required amount to crops. It also contains plant growth regulators such as NAA, cytokinin and GA3 as well as other beneficial soil conditioning and waste decomposing organisms. Scientists and research fellows from NAU are still working on this product for further enrichments.
- Scientists have tried this product with more than 500 different combinations of natural plant extracts to enhance the pesticidal and fungicidal properties and has conducted trials on various categories of the crops. Result data were scientifically analyzed and best combinations were tested again on demonstration plot as well as on the farmer's field on different crops.

- Studies were also carried out to analyse the results on particular insect-pests and diseases on different crops. Results depicts that 'Novel' significantly works to control the aphid, jassid, borers, thrips and all kind of larvae for most of the field crops whereas 'Novel Prime' works efficiently to control the fungal and bacterial diseases.
- NAU has also planned to commercialise this product through select agro-chemical companies across the state.

b) Out of box initiatives undertaken by IDP partner AUs

Name of the institute: Sher-e-Kashmir University of agriculture science and technology of Jammu (Jammu and Kashmir)

S. No	Initiative	Brief	Photograph
1	Low cost Pyrolyzer	Low cost Pyrolyzer is used for orchard residue and weed management purposes.	
2	Low Cost Integrated Mulch Laying Machine	Tractor drawn plastic mulch laying machine with covering and dibbling device	
3	Remotely controlled self-propelled boom sprayer	Student Innovation: Ahmer Bashir, Agri Engineering • 360 degrees turning ability • Semi-automatic machine • Radio systems work in the range up to 500 m.	

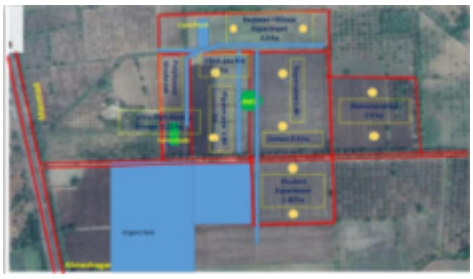
Name of the institute: University of Agricultural Sciences, Dharwad

S. No	Initiative	Brief	Photograph
1	Classroom Innovation: Flipped classes in English Language	• Flipped classes in English language have been developed to provide opportunity to students to improve their skill in English language. • A total of **40 video modules** on English language grammar and writing skills have been prepared including content presentations followed by assessment in each module.	
2	Green initiatives Paper recycling	• Based on feasibility and desirable properties, 200 kg of waste has been recycled into 440 GSM paper sheets. • These paper sheets are being used to make the office files, folders, bags etc.	

S. No	Initiative	Brief	Photograph
3	Miyawaki Forest at Hi- tech Horticulture Unit at UAS, Dharwad's main campus	• **Miyawaki forest** is a technique invented by Japanese botanist **Akira Miyawaki** which helps build and reconstitute indigenous forests. • Use of this technique result into **10 times more production outputs with 30 times denser plantation** than usual forestation techniques. • AU has used indigenous varieties for plantation where this technique has been promoted, which involves comparatively less maintenance for **next three years.** • Through use of this technique, a protective forest will be ready in **20 to 30 years** whereas through natural succession technique, it would take **200 years in temperate and 300 to 500 years in the tropics** condition. • Adoption of this technique would provide the sunlight to saplings from the top which would help tree to grow upwards than horizontal. • This method is being practiced across **40 countries and over 40 million trees** have been planted so far.	

Name of the institute: Mahatma Phule Krishi Vidyapeeth, Rahuri (Maharashtra)

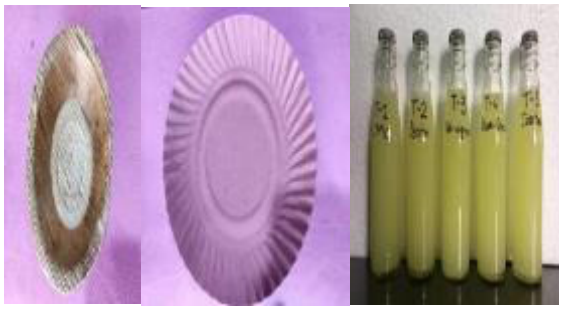
S. No	Initiative	Brief	Photograph
1	Automatic ring infiltrometer	• To overcome the challenges related to a conventional double-ring infiltrometer, an automatic ring infiltrometer has been designed, developed and tested in the field for infiltration rate measurement by AU. • This instrument provides more precise measurement as compared to existing infiltrometers. It can be used to measure the rate of water infiltration into the soil and other porous media.	
2	Indigenous Traditional Knowledge	• AU has identified 42 Indigenous Traditional Knowledge (ITK) from Tribal Farmers of Akole block (Ahmednagar district) in crop production, livestock management and rainfall prediction. • Adoption of these ITK practices are cost effective and has potential to improve the economic condition of the farmers. These practices are eco-friendly and has adaptive capacity against climate change.	

S. No	Initiative	Brief	Photograph
3	Village level Contingency Crop Plan	• Developed **"Village level Contingency Crop Plan"** for cluster of seven villages in Akole block (Ahmednagar district) with joint efforts of NABARD, State Agriculture Department, KVKs, Farmers, NGOs and Experts from respective departments including RIDA and ATARI.	
4	Field Innovation: Development of Climate Smart Agriculture Blocks	• Climate Smart Agriculture Blocks were developed with climate smart agriculture and water management research experiments. • Technology demonstrations are implemented with **Automatic Weather Station (AWS) and Microclimate Monitoring Station (MMS).** • Lysimeter was installed to record micrometeorological studies, weather parameters, and measure the amount of actual evapotranspiration with climate smart agriculture and water management techniques at the Experimental Farm of Mahatma Phule Krishi Vidyapeeth, Rahuri.	

Name of the institute: ICAR - Central Institute of Fisheries Education, Mumbai (Maharashtra)

S.No.	Innovation	Photograph
1	**Development of skewered shrimp using ISW reared Penaeus vannamei** • Spiral skewered products locally known as **Tornado** are a popular street food in South Korea, it is generally made up of potatoes. • Efforts were made for the first time to develop a similar product from **ISW reared P. vannamei.** • Quality shrimp of 35-40 count were dressed and wooden barbecue sticks were inserted in individual shrimp with cut in a spiral shape, battered and deep fried at 180^{0}C. • The procedure of preparation was standardized after trials and sensory evaluation. • Because of spiral cuts, the shrimp gets elongated and battering makes it appear bigger in size.	

Name of the institute: Navsari Agricultural University, Navsari (Gujarat)

S.No.	Innovation Product	Photograph
1.	Essential oil extracted from 18 Eucalyptus clones	
2.	• Herbal Whey Beverage • Banana Paper Plate • Palm Donas	
3.	**Development of Fortified tricolour Semolina with whole wheat pasta by using food extruder:** • Bio / Naturally Fortified Pasta with beet juice was prepared under this NAHEP-CAAST sub-project. It is very rich in β-Carotene. • Spinach and Drumstick leaves are good source of Calcium and Iron content used in this product. This product is priced at Rs. 30 per 200g pack and Rs. 140 per 1 kg pack.	
4.	Semolina with whole wheat Palak pasta	
5.	Semolina with whole wheat turmeric pasta	

S.No.	Innovation Product	Photograph
6.	**Wooden Candles** **Description:** Wooden Candles are being prepared by collecting the waste wood and bamboo internodes coated with eco-friendly varnish and paint. **Raw material used:** China clay / chalk powder, wooden block, sandpaper, adhesive, varnish, bamboo internodes. **Product cost: Rs. 30/-**	
7.	**Rakhi** **Description:** This Eco-friendly Rakhi has been prepared by using wooden pieces, few NTFPs and varnish. **Raw material used:** Wooden pieces, seeds, thread, bamboo pieces, coconut holder, sandpaper & varnish **Product cost: Rs. 20 to 30/-**	

Name of the institute: University of Agricultural Sciences, Bangalore (Karnataka)

Innovation Product	Brief	Photograph
1. Solid State Refrigeration Module	The module was displayed during the 108th Indian science congress held at UAS, GKVK, Bengaluru **where 3 private entrepreneurs expressed their interest to collaborate in developing a similar module of smaller capacity with lighter materials to commercialise** the same.	
2. Value added products	Khakhra, idli, dosa, pulav and upma using Kodo millet	
3. Solar operated power sprayer	• The demonstration of solar operated power sprayer developed by NAHEP-CAAST-VNMKV, Parbhani was held during international workshop. • This solar operated power sprayer is innovative and is being operated on green energy.	

Name of the institute: Chandra Shekhar Azad University of Agriculture & Technology, Kanpur

S.No.	Innovation Product	Photograph
1	• Millets based Cowpea fortified Murukku, Pasta & Biscuit • Millets based Moringa oleifera fortified products • Murukku, Pasta & Biscuits	 
2	• Wheat based Moong Cookies • Wheat based Cowpea Cookies	 
3	• Ginger Candy • Karonda jam	 

Name of the institute: Kerala Agricultural University, Kerala

S.No.	Innovation Product	Photograph
1	**Coconut fiber enhanced Cement Board:** • **Mr. Jishnu V G**, BSc Forestry graduate developed Coconut fibre enhanced Cement Board (CFCB). These boards are used in ceiling, corrugated or straight roof tops, hollow bricks, furniture/Box components. • Ensures economic returns for coconut farmers without creating any negative ecological impact	
2	**Coco cubes:** • Unique and innovative health drink developed by **Mr. Jerome**, which is being promoted as India's first one-digit energy drink from coconut. • Natural, healthy, nutritional and low-calorie alternative to carbonated health drinks available in multi-flavours.	

S.No.	Innovation Product	Photograph
3	**Coconut wood carvings:** • **Mr. Praveen K P** developed coconut palm wood-based carvings, Fixtures & furniture. • Commercial processing of coconut wood and export-quality finished products serve as eco-friendly and effective waste to wealth product. • The product is highly reliable, cost effective and generates employment opportunities for Coconut farmers.	
4	**Adrics products:** **Mrs Chithra,** a passionate Agripreneur started her Start-up, M/s Adrics Agro Products at Palakkad in 2016. The flavoured whey coconut milk drink & coconut milk cubes are purely vegetarian, healthy, highly nutritious and delicious. The product is great source of protein and minerals.	  
5	**Fabrication of machineries in coconut value chain:** • Coconut Dehusker • Tender coconut trimming cum punching machine • Rotary oven • FDM 3d printer • Coconut desheller	
7	**Palmwood Pillars through advanced boring and peeling technology:** Mr. Hariharan, an entrepreneur from Calicut got himself engaged in the production of coconut stem wood-based furniture, fixtures and handicrafts is collaboration with KAU - CAAST project.	

Name of the institute: Vasantrao Naik Marathwada Agriculture University, Parbhani

S.No.	Innovation Product	Photograph
1	**Cotton Picker Machine**	

S.No.	Innovation Product	Photograph
2	**Multi-Functional Solar Sprayer Robot:** • The robot is designed to move in both the directions with the help of 4 wheels - 2 small and 2 big wheels. The combination of small and big wheels provides the stability to the robots on the field. • The IoT based camera is mounted for monitoring and addressing, both voice and video signals are continuously being transmitted on the 4G communication network for remote visualization. • V380 is an android application which is used for live field monitoring. • Necessary energy requirement of the robot is fulfilled by the battery mounted on the robot. The battery can be charged through the solar panel mounted on the robot or electrical supply.	

Name of the institute: Bidhan Chandra Krishi Vishwavidyalaya, Haringhata (West Bengal)

Sl.	Initiative undertaken	Activity
1	• Established a demonstration unit at university farm	
2	• Installation of solar energy driven micro irrigation system and operation of 10 HP pump using solar energy	

Name of the institute: Kamdhenu University, Gujarat

S. No	Initiative	Brief
1	Nanotechnology based dipstick for the instant detection of milk adulterants	• College of Dairy Science, Kamdhenu University, Amreli has developed "**Nanotechnology based dipstick for the instant detection of milk adulterants**". • IPR has also been filed for this innovative technology • Technology transfer process has already been initiated

D. List of key personnel involved in NAHEP governance and implementation

Participants of World Bank Team in Implementation Support Review Mission

S.No.	Name	Designation
1	Mr. Bekzod Shamsiev	Task Team Leader
2	Ms. Priti Jain	Sr. Procurement Specialist
3	Ms. Papia Bhattacharya	Sr. Financial Management Specialist
4	Ms. Vanitha Kommu	Consultant, Environment Safeguard
5	Ms. Surbhi Dingra	Consultant- Social Safeguard
6	Ms. Asha Bhagat	Consultant- Financial Management
7	Ms. Kumudni Choudhary	Program Assistant

List of key Personnel involved in NAHEP implementation at PIU level

PIU NAHEP, KAB-II, Pusa Campus	
1	Dr. R. C. Agrawal, National Director
2	Dr. P. Ramasundaram, National Coordinator, (Sub-component: 1a)
3	Dr. Prabhat Kumar, National Coordinator, (Sub-component: 1b and Component: 2)
4	Dr. Hema Tripathi, National Coordinator, (M & E and Nodal officer- ES and SS Measures)
5	Mr. Dilip Roy, Deputy Secretary
6	Mr. N. K. Arora, Deputy Director-Finance
7	Mrs. Ritu Chahal, F&AO
8	Mr. N K Sarvang, Section Officer
9	Mr. Vishwa Ratan Bharati, Assistant
10	Smt. Suman Lata
11	Mr. Rishabh Narang

List of Consultants / RAs / SRFs involved in NAHEP implementation at PIU level

PIU NAHEP, KAB-II, Pusa Campus	
1	Dr. Ajay Kumar, RA, IDP
2	Dr. D.K. Jayswal, RA, CAAST
3	Dr. Shailja Thakur, RA, IG
4	Dr. Suvarna Mahalle, RA, Component 2
5	Dr. Shanti Singh, SRF, IDP
6	Dr. Ritika Joshi, SRF M&E
7	Mr. Ashish Pandey, SRF, Procurement Management
8	PricewaterhouseCoopers Private Limited, M&E Consulting firm
9	RITES Ltd., Procurement Consultant
10	Lochan & Co., Internal Audit Consultant
11	Ms. Indira Prakash, Specialist, Environmental Safeguard

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