ANNUAL REPORT
2021-22

National Agricultural Higher Education Project
Project Implementation Unit
Indian Council of Agricultural Research, New Delhi
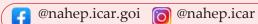
National Agricultural Higher Education Project (NAHEP)

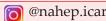Indian Council of Agricultural Research and World Bank Project

NAHEP

Annual Report 2021-22

Project Implementation Unit – NAHEP
Indian Council of Agricultural Research
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Abbreviations

S.N.	Abbreviation	Full Form
1	AAU	Anand Agricultural University
2	AAU	Assam Agricultural University
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, Ranchi
23	BCKV	Bidhan Chandra Krishi Vishwavidyalaya, West Bengal
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	Post Graduate
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
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
173	SVVU	Sri Venkateshwara Veterinary University

S.N.	Abbreviation	Full Form
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

CONTENT

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सचिव, एवं महानिदेशक

Dr HIMANSHU PATHAK
SECRETARY (DARE) & DIRECTOR GENERAL (ICAR)

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कृषि अनुसंधान और शिक्षा विभाग एवं
भारतीय कृषि अनुसंधान परिषद
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Foreword

ICAR launched World Bank aided National Agricultural Higher Education Project (NAHEP) in 2017 for improving the quality of higher agricultural education. Through NAHEP, a fundamental change in approach, financial sustainability, accountability, autonomy and transparency was envisaged to improve the quality and relevance of higher agricultural education. Under NAHEP the projects have been implemented across 62 AUs of the ICAR-AU system.

NAHEP is addressing the policies, quality assurance, harmonization for common academic regulations and governance, effective curricula delivery mechanism, faculty competence and student development. It aims at enhancing the learning outcomes of the students and improving faculty effectiveness through national and international trainings, exposure visits, guest lectures, creation of world class infrastructure, ensuring academic continuity amidst social restrictions etc.

NHAEP's Annual Report 2021-22 illustrates the activities, significant achievements, and salient success stories under different components of the NAHEP. The periodical functioning of the institutional mechanisms for implementation and monitoring such as National Steering Committee (NSC), Project Management Committee (PMC), Agricultural Higher Education Programme Committee (AHEPC) and World Bank are also included. The continuous feedback and suggestions of these meetings have helped achieving desired outcomes. The guidance and stewardship of Dr. T. Mohapatra, former Secretary, DARE & Director General, ICAR in this endeavour is highly acknowledged.

It is heartening to learn that by March 2022, over 500 students and 250 faculties have undergone international trainings and about 595 pilot courses have been developed on emerging areas of agri and allied sector to bring relevance in existing curricula delivery mechanism. NAHEP support enabled 11 AUs to attain ICAR accreditation during last three years. The NHAEP also helped strengthening of digital infrastructures of the ICAR-AU system under its Compnenet-2. The virtual classrooms were established at 18 AUs and implementation of Agri-DIKSHA web channel helped development and uploading of over 20,000 e-contents by partner AUs. Besides, AR/VR labs were established at 10 partners AUs.

I appreciate the commendable efforts made by Dr. R. C. Agrawal, National Director and his team in preparing this report and hope that NAHEP will play an important role in improving the quality and relevance of higher education in agricultural sciences with lasting impacts for the development of agriculture sector in India.

(Himanshu Pathak)

Dated the 18th October, 2022
New Delhi

राष्ट्रीय कृषि उच्चतर शिक्षा परियोजना (राकृउशिप)
National Agricultural Higher Education Project (NAHEP)
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NAHEP

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

PREFACE

Indian Council of Agricultural Research (ICAR), with financial assistance from the World Bank, has launched National Agricultural Higher Education Project (NAHEP) to transform the country's agricultural higher education. To enhance the quality and relevance of agricultural higher education, the 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 linkages with industry and other HEIs, and supporting the digitization of the overall academic ecosystem. **The Annual Progress Report, 2021-22, presents the implementation progress of NAHEP and highlights the significant achievements made during the mentioned period.**

Project implementation has witnessed significant achievements during the last year despite Covid-19 disruptions. Till March 2022, **62 Agricultural Universities** across the country were awarded projects under different components of NAHEP.

Till March 2022, students and faculties have visited ~120 international HEIs and got trained 330 emerging areas of agri and allied sector to enhance their academic and entrepreneurial capabilities, employability, developed more than 400 pilot/certificate courses on cutting edge areas of the sector which benefitted more than 30,000 students in last two years. Project partners have also developed 314 facilitative units like IIIC Cell, placement cell, alumni cell, AI labs, robotic labs, AR/VR facilities, e-content development studios, learning and assement centre and various other digital infrastrutres to ensure the academic continuity and bring excellence in overall education delivery.

Technologies and innovative approaches developed around emerging areas of the sector such as precision agriculture, genomics, robotics, conservation agriculture, aquaculture are not only enhancing the research effectiveness but also benefitting the farmer community.

Furthermore, in addition to regular monitoring of sub-projects, M&E team has developed AU-Implementation Performance Scoreboard (AUIPS) to ensure the effective implementation of the project at partner AU level. Other activities entail assessing the measurable intermediate outcomes through a Mid-line survey, Satisfaction mapping of direct project beneficiaries, organizing M&E Clinics, Measuring Graduate Income Index etc. The procurement and financial progress have also been closely monitored and expedited through multiple review meetings and virtual handholding sessions.

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

During the entire project implementation period, the constant encouragement, guidance and support extended by Dr. Trilochan Mohapatra, the then 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 the administration of the Project provided by Additional Secretary, DARE & Secretary, ICAR and in financial management by 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, and AHEPC have played an essential role in the effective implementation of NAHEP. We highly appreciate the regular support and guidance of the current Task Team Leader (TTL) of NAHEP from the World Bank - Mr. Bekzod Shamsiev, and the WB team. Noteworthy to mention the contribution of 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, the then 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 Dr. Dhiraj K. Singh, 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.

(R. C. Agrawal)

Dated the 19th October, 2022
New Delhi

Executive Summary

NAHEP is designed to strengthen the national agricultural education system in India with an 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 the 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 the 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 a total project cost of USD 165 Million, having 50:50 cost sharing between GoI and World Bank. The project has been approved with a timescale extension of up to one year and four months, i.e., 31st March 2024. Placed below is the re-structured budget outlay considering the extension of the overall project.

Details have been tabled below as per the project restructuring:

NAHEP Cost by Component	Budget
	INR Crores
1. Support to Agricultural Universities	
1a. Institutional Development Plans (IDPs)	462
1b. Centres for Advanced Agricultural Science and Technology (CAASTs)	308
1c. ICAR Innovation Grants to AUs	96
2. Investment in ICAR in Agricultural Higher Education	188
3. Project Management and Learning	45
4. Front-end Fee	13
Total	**1,100**

Till March 2022, 62 Agriculture universities (AUs) have been awarded under NAHEP, wherein 22 AUs come under IDP, 16 AUs under CAAST and 24 AUs under IG in component

The beneficiaries of NAHEP include **74 institutions** that form the ICAR-AU System, which encompasses **63 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 Component 2.**

Till March 2022, **62 Agriculture universities (AUs)** have been awarded under NAHEP, **wherein 22 AUs come under IDP, 16 AUs under CAAST and 24 AUs under IG in component 1. Besides, 2 ICAR institutes, i.e., ICAR-Indian Agricultural Statistics Research Institute (IASRI) and ICAR-National Academy of Agricultural Research Management (NAARM), has been implementing Component 2 of NAHEP**.

Project details encompassing name of awarded AUs, Component, Title of the project, thematic areas and fund sanctioned are placed in **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**	22
1b: Centres for Advanced Agricultural Science and Technology (CAAST)	Scientific entrepreneurship, employability and research effectiveness; focus on **PG and PhD 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**

Key provisions for funding 22 projects 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 the twinning plan**. In addition to these priorities, emphasis is also being placed on **effective industry linkages to enhance the 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 stakeholders' role in curriculum design, course evaluation and overall faculty and student development**. Till April 2022, more than 400 students and faculties have completed their international trainings in foreign institutions. During the period, IDP partner AUs have conducted more than 170 guest lecture series on entrepreneurship development trainings, established industry and institution linkages with more than 35 organizations etc. Introducing AR/VR modules, establishing language proficiency lab, organizing interactions with Alumni, and developing e-content modules are some of the out-of-box initiatives undertaken by IDP partner AUs during the period.

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 the 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 April 2022, ~160 students and faculties have completed international trainings, whereas **more than 4,000 national level trainings/ seminars** have been conducted to develop the scientific entrepreneurship of students and enhance research effectiveness. Development of climate-smart agriculture tools, innovative secondary agricultural technologies, and the establishment of innovative research labs are some of the out-of-box initiatives undertaken by CAAST partner AUs during the period.

IG projects have been awarded to select participating AUs to attain accreditation. Till date, 24 sub-projects have been awarded under this component. Key IG activities include **national-level trainings for faculty upgradation, master and Ph.D. sandwich programs, alum linkages, industry seminars and professional workshops, and e-enabled learning activities** etc. It is worth mentioning here that, in the last three years,

11 AUs under the IG have attained ICAR accreditation due to NAHEP support and interventions.

Component 2 aims to support ICAR to carry out institutional reforms within ICAR and enhance its effectiveness in coordinating, guiding and managing agricultural higher education in the country. Till date, activities undertaken **are strengthening key digital infrastructures of the ICAR-AU system, such as the establishment of virtual classrooms at 18 AUs and effective implementation of the Agri-DIKSHA web channel, which has more than 20,000 e-contents developed and uploaded by partner AUs, the establishment of AR/VR labs at ten partners AUs, the launch of KVC-Alnet and facilitate the AUs for ensuring the alums registration-so far more than 43,000 alumni have been registered on the portal etc. are some of the key initiatives undertaken by Component-2 of the project.**

The major activities and achievements under the Monitoring and Learning component include P**rocess Evaluation and Dipstick Surveys** such as assessing the **Graduate Income Index of 1-year graduate students, assessment of the measurable intermediate outcomes through Mid-line survey specifically on facilitative units, Development and implementation of AU Implementation Performance Scoreboard (AUIPS), Satisfaction mapping of direct project beneficiaries, organizing M&E visits to select AUs etc**.

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), and Strategic study to assess the requirement of human resources in agriculture and allied fields for next 20 years** etc. The infrastructure developed, teaching, learning and skill upgradation initiatives under NAHEP are very much aligned with the **National Education Policy (NEP) 2020 formulated by the Government of India**.

This Annual Report of NAHEP highlights the outcome-focused achievements made under different components of NAHEP, including 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 effective project implementation.

Introduction

Over the years, there has been a paradigm shift in tertiary education teaching and learning practices throughout the world. NAHEP is addressing the gaps in agricultural higher education in India by improving AU performance through quality enhancement, better employment and entrepreneurship opportunities for agriculture graduates, non-accredited AUs attaining ICAR accreditation, and implementing institutional reforms in the education division of ICAR.

This programme has been promoting efficiency and competitiveness through changes in the 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.

Project Objectives
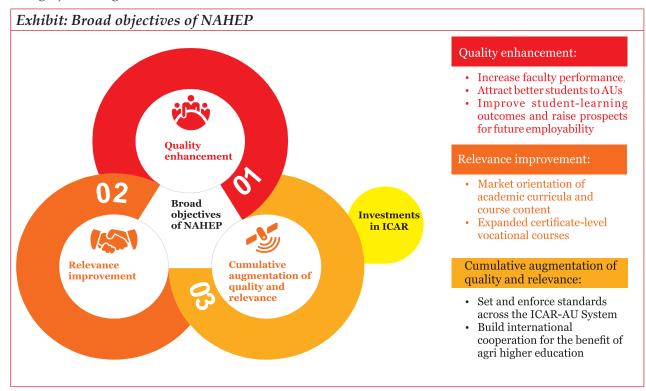
The overall objective of the **NAHEP** is to support Participating Agricultural Universities and ICAR in providing more relevant and higher-quality education to the students. **NAHEP** addresses quality by supporting interested AUs to propose and implement technically sound and verifiable investments 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 "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 the 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 the market by re-orienting the skill sets at AUs, especially in Agricultural Higher Education and avoid a misfit 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 endeavours to increase agricultural productivity and support quality improvements in higher education and ensure a 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 the 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 the 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 Centres for Advance Agricultural Science and Technology (CAAST), multidisciplinary centres 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 centres 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 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 the 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 a total project cost of **USD 165 Million (INR 1100 Cr approximately)**, 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%
4. 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 funding partners.

Project Beneficiaries

The beneficiaries of NAHEP comprise **74 institutions** that form the **"ICAR-AU System**", which encompasses 63 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 Component 2.
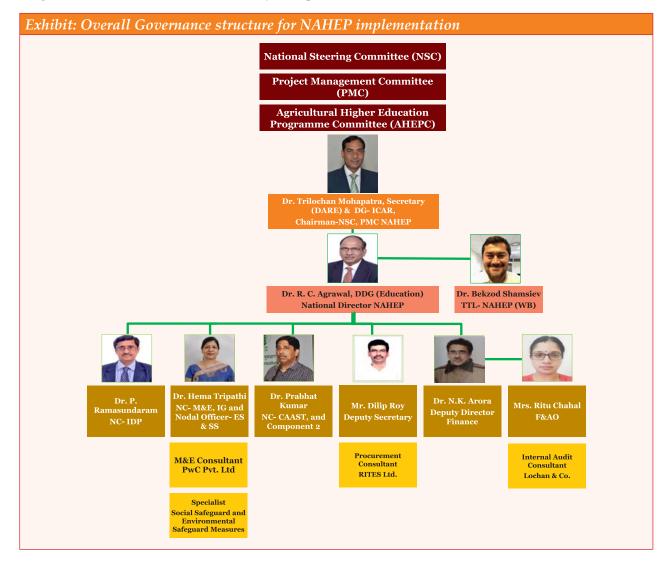
	Key beneficiaries & emerging benefits to them
Students	❖ Enhancing quality and relevance of teaching and research from new learning-centred education, leveraging ICT and external partnerships; ❖ Effective stakeholder participation in curricula development, pedagogy options and course evaluation; and ❖ Expanded learning and academic environment to sharpen students' skill sets for their improved employability.
Faculties	❖ Increasing collaboration among Indian AUs and with other international universities to raise research quality and educational quality, relevance; and ❖ Training and capacity building to improve the delivery of education and its learning outcomes.
Institutes	❖ Governance & transparency, Infrastructural development; and ❖ Productive campus culture and intensive use of technology-enabled learning.

Project Implementation: Governance Mechanism

NAHEP was approved in **October 2017** , and subsequently, the loan agreement was signed in the same month. The project commenced operation effectively from **November 2017**. During the 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

National Steering Committee (NSC)

Project Management Committee (PMC)

Agricultural Higher Education Programme Committee (AHEPC)

Dr. Trilochan Mohapatra, Secretary (DARE) & DG- ICAR, Chairman-NSC, PMC NAHEP

Dr. R. C. Agrawal, DDG (Education) National Director NAHEP

Dr. Bekzod Shamsiev TTL- NAHEP (WB)

Dr. P. Ramasundaram NC- IDP

Dr. Hema Tripathi NC- M&E, IG and Nodal Officer- ES & SS

Dr. Prabhat Kumar NC- CAAST, and Component 2

Mr. Dilip Roy Deputy Secretary

Dr. N.K. Arora Deputy Director Finance

Mrs. Ritu Chahal F&AO

M&E Consultant PwC Pvt. Ltd

Procurement Consultant RITES Ltd.

Internal Audit Consultant Lochan & Co.

Specialist Social Safeguard and Environmental Safeguard Measures

The structure and roles of each of the committees and levels are 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.	Secretary (DARE) & DG, ICAR	Chairman
2.	Financial Advisor (DARE/ICAR)	Member
3.	Secretary (ICAR)	Member
4.	Representative of Ministry of Agriculture and Farmer's Welfare	Member
5.	Representative of Ministry of Skill Development	Member
6.	Representative of University Grants Commission	Member
7.	Vice Chancellor of CAU/AU (2)	Member
8.	Director of a Deemed University (ICAR)	Member
9.	Representative from Industry	Member
10.	Representative from Public Sector	Member
11.	National Director, 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.	Secretary (DARE) & DG, ICAR	Chairman
2.	Financial Advisor (DARE/ICAR)	Member
3.	Secretary (ICAR)	Member
4.	Deputy Director General, ICAR (2)	Member
5.	Vice Chancellor of CAU/AU (2)	Member
6.	Director of a Deemed University (ICAR)	Member
7.	Representative from Industry (2)	Member
8.	Project Director	Member
9.	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. **A total of 62 projects, viz. 22 under IDP, 16 under CAAST and 24 under IG, have been approved and awarded to date.** The composition of the AHEPC is as follows:

S. No.	Name & Designation	Position
1.	National Director, NAHEP	Chairperson
2.	Vice Chancellor of SAU (3)	Member
3.	Vice Chancellor of CAU/Director DU (2)	Member
4.	Representative from AICTE/IITs/IIMs (2)	Member
5.	Education Specialists from a different discipline (4)	Member
6.	Representative from Industry (2)	Member
7.	Assistant Director General (Education), ICAR (1)	Member
8.	Project Director	Member Secretary

Project Implementation Unit:

The Project Implementation Unit (PIU) is responsible for the overall project implementation, coordination and facilitation under the guidance and supervision of the 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 the PIU team has been presented in Annexure -G.

Key meetings held by NAHEP governance are presented herewith.

S. No.	Meetings	Date
1.	AHEPC Meeting	2nd April 2021
2.	NAHEP Annual Review Meeting	2nd and 3rd June 2021
3.	PMC Meeting	17th June 2021
4.	AHEPC Meeting	15th September 2021
5.	TPRM Meeting	15th November 2021
6.	PMC Meeting	10th October 2021
7.	PMC Meeting	23rd February 2022

The various committees and the governance structure of NAHEP have been responsible for the overall project implementation. The same was achieved not only because of the 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 the project.

The major achievements and activities undertaken within NAHEP during 2021-22 have been presented in the subsequent chapters.

NAHEP - Key activities & achievements

Major activities and achievements made under different components of the NAHEP project during FY 2021 – 22 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 **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 for the twinning plan**.

The learnings and exposure gained- through the NAHEP trainings have made a significant upward change in my professional capabilities. On one hand, it has enhanced my technical & problem-solving skills to pursue higher education while solving soil-related problems in my area. On the other hand, it has broadened my perspective in day-to-day decision-making, improved my presentation, communication, and interpersonal skills, and allowed me to work in a multicultural and multifunctional team environment.

- Ankita Mohapatra, student from OUAT, Bhubaneshwar

In addition to these priorities, emphasis is also being placed on **effective industry linkages to enhance the 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 stakeholders' 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 also helped to convert the restrictions from a deep crisis into an opportunity for increasing digitization and effectively implementing 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 FY 2021-22, IDP awarded the sub-projects to 22 AUs spread across 16 states/UTs in the country. The total budget outlay of the component is **USD 69.4 Mn (INR ~462 Crores)**. The geographical distribution of the AU awarded under IDPs is tabulated herewith:

State/UT	Partner AUs	State/UT	Partner AUs
1. **Andhra Pradesh**	1. ANGRAU, Lam (Guntur)	**9. Odisha**	12. OUAT, Bhubaneswar
2. **Assam**	2. AAU, Jorhat	**10. Punjab**	13. GADVASU, Ludhiana
3. **Gujarat**	3. JAU, Junagadh	**11. Rajasthan**	14. MPUAT, Udaipur 15. SKNAU, Jobner
4. **Haryana**	4. NDRI, Karnal, 5. CCS HAU, Hisar	**12. Tamil Nadu**	16. TANUVAS, Chennai, 17. TNAU, Coimbatore
5. **Himachal Pradesh**	6. DYSPUH&F, Solan	**13. Uttarakhand**	18. GBPUAT, Pantnagar
6. **Karnataka**	7. UAS, Dharwad 8. UHS, Bagalkot 9. UAHS, Shivamogga	**14. UP**	19. DUVASU, Mathura
7. **Madhya Pradesh**	10. RVSKVV, Gwalior	**15. J&K**	20. SKUAST, Kashmir 21. SKUAST, Jammu
8. **Manipur**	11. CAU, Imphal	**16. Maharashtra**	22. Dr BSKKV, Dapoli

b. Key activities undertaken

During the current implementation period, altogether, 22 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 the development of e-course contents, online examination platform, virtual learning platforms, e-content creation etc. Such digitally embedded infrastructures have not only continued academic activities but also widened 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.

"JAU has established Robotics and Automation lab to impart the practical applications of precision agriculture tool like robotics, drones, IoT etc. not only for AU beneficiaries but also has plans to commercialize the same."
-Robotics and Automation Lab, JAU Junagadh

Digital interventions to improve operational efficiencies

AUs have taken several digital initiatives such as the development of mobile or web-based applications in order to improve operational efficiencies, academic & teaching purposes, enhance connections with alumni etc. The ultimate aim to undertake such initiatives is to widen the horizon of the teaching scope and provide global-level learning to the students. This not only helps ICAR- AU system to readily adapt to meet the needs of new-age industries while staying relevant but also improves the overall quality of agricultural higher education in the country. Below are some of the key initiatives undertaken by partner AUs of IDP.

Digital Intervention	Brief	Photograph
Virtual Reality Lab at TNAU, Coimbatore	• TNAU, Coimbatore, has developed 15 modules of agronomy based on VR and AR.	
Language Lab at CAU, Imphal	• Language Laboratory at College of Veterinary Sciences and Animal Husbandry, Aizawl.	
Digital Extension Innovation Lab (DEIL) by TNAU, Coimbatore	• The lab consists of sound-proof material, 24 workstations equipped with computers, a pan-tilt-zoom camera, a video editing system and a smart board. • The students opting for media advertising and graphic designing course are trained in – Graphic, UI & logo designing, film making & animation concepts, photoshop etc. Till now, it has a total of 1400 beneficiary students.	
Alumni management portal by ANGRAU, Guntur	• An Alumni management portal has been developed to establish the linkages between alumni and the institute. https://www.angraualumni.com	
AR/VR facility, GBPUAT, Pantnagar	• The lab is well equipped with two 3-D projectors, a video processor, a silver projection screen for 3-D view, 16 VR headsets, 3-D polarized glasses and a seating capacity for 100 individuals. • The laboratory aims to provide video lectures, web resources and animated demonstrations for undergraduate courses.	

Virtual learnings for 'Academic Continuity'

During the pandemic period over the last FY 2021-22, 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, and competitions are some of the key initiatives undertaken by IDP

partner AUs during the period. More than 4,000 such online programs were organized by partner AUs last year. Below are some of the related initiatives undertaken by partner AUs of IDP.

Programs	Brief	Photograph
Virtual Class-rooms	• Strengthened the digital infrastructure helping us to develop digital content and instructional videos in various formats for student learning • Around 25 lectures have been taken through this setup & recorded more than ten lectures.	
E-studio	• For conducting online classes, remedial classes, virtual meetings, and live streaming for all the colleges simultaneously.	

'Out of box' initiatives undertaken

Partner AUs under IDP has been playing an 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 the 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.

"Through IIIC Cell, GBPUAT promotes students' innovative ideas and facilitates to emerge agri start-ups with successful business propositions."

-IIIC Cell, GBPUA&T Pantnagar

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
Classroom Innovation: e-content portal by GB-PAUT, Pantnagar	• Developed and launched an e-content portal, Certificate courses portal, with 550 modules, video lectures of 175 hours, and 780 study materials. • A total of 1,85,760 hours of viewers/learners have been invested on the portals in accessing and studying the materials.	
Language Laboratory- AAU, Jorhat	• Established language labs in four constituent colleges of AAU. • Students will be able to learn four foreign languages, namely, English, French, German and Spanish. • It will benefit the students to opt for academic opportunities abroad, and for personal growth.	

Initiatives	Brief	Photograph
High-tech Soft Skill Laboratory and Training Center	• Established high-tech Soft skill lab and training centre was established with 25 capacity.	
Learning Management System (LMS)	• LMS is a digital ecosystem that serves as a platform for effectively delivering the course contents, monitoring students, making periodical assessments, and getting real-time, in-depth feedback. • LMS is used to develop course content, set question papers, and conduct exams and evaluations for the III-year students of B.Tech (Biotechnology) and B.Tech (Food Technology).	
Innovation Cell & Incubation Facility	• Established an Innovation Cell & Incubation Facility at College of Forestry, Sirsi and Main campus, UAS, Dharwad. • Provides a platform to boost students' activities - research in niche areas, ideation, prototype development, market research, and startup ecosystem.	

C. Output-outcome monitoring under IDP

S. No.	Additional monitoring indicators	Baseline	Unit of measure	Till March '22 (Cumulative figures)	
				Planned	Achieved
1.	% increase in AU on-time graduation rate	77	%	85.4	95.5
2.	% increase in cut-off scores for students in ICAR entrance tests	26	Percentile	28.6	36.7
3.	% increase in student placement rates	41.9	%	46.2	60.3
4.	% increase in faculty research effectiveness	21.2	h-index value	23.2	29.2
5.	Reduced student inbreeding (% AU students admitted from other states)	19	%	22.1	25.3
6.	Reduced faculty inbreeding (% faculties with HE degrees from more than one university and more than one state)	45	%	54.0	54.5
7.	Improved AU revenue generation (% change in Internal revenue of AU)	8.5	%	12.8	12.4
8.	Number of direct beneficiaries of the project	0	Number	30,000	110,519

S. No.	Additional monitoring indicators	Baseline	Unit of measure	Till March '22 (Cumulative figures)	
				Planned	Achieved
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	132	245
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	63	243
12.	Number of MoUs signed with industry for knowledge exchange programs/ internships / short-term training programs etc.	0	Number	176	254
13.	Number of faculty training programs (both national and international) organized by AUs	0	Number	179	992
14.	Number of student training programmes (both national and international) organized by AUs	0	Number	813	1698

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.

Introducing AR/VR modules, establishing language proficiency lab, organizing interactions with Alumni, and developing e-content modules are some of the key initiatives that supported AUs in achieving remarkable outcomes during the period.

The overseas training at the University of Copenhagen, Denmark, gave me exposure to the state of art technologies in the Dairy field while enhancing my technical knowledge, team management skills and overall experience during the program.

- Ms. Sakshi, student from ICAR-NDRI, Karnal

d. Input and activity monitoring

Input / Activity indicator	Sub- head / category	Apr'21 to March'22	
		Expenditure/input in INR lakhs	
		Planned	Utilization
Goods and equipment	Equipment, Plant & Machinery	37.82	32.34
	Office equipment	68.24	33.49
	Laboratory equipment	2111.51	1100.83
	Furniture & fixtures	247.35	220.69
	Computers and Peripherals	808.16	986.26
	Books and Journals	171.48	146.82
Civil works	Minor repair and renovation work	850.53	591.52
Human capacity building	National level training	50.65	2.10
	International level training	2229.83	235.20
	Short visit/ seminars	206.08	29.30
	Meetings and workshops	159.72	89.99
Consultancy	National level consultancies	235.07	41.12
Recurrent cost / Miscellaneous	Travel	175.78	65.86
	Contractual services	1058.44	865.12
	Operational costs	7939.17	2211.35
	Institutional charges	389.51	155.28
Total	**Total**	16,767.00	6,966.45

Out of planned **INR 167 Cr** expenditure across key input categories, utilization under the IDP component is **INR 69 Cr,** i.e., utilization percentage stood at **41.3%** for FY 2021 – 22. More efficient planning is required for specific expenditure heads like goods and equipment, Civil works, plant and machinery, national level consultancies, and international level trainings, leading to higher utilization percentage. Due to '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 a low rate of utilization of funds under these heads.

Under NAHEP, the learnings gathered from the training at Iowa (USA) on the Topic – "Conducting research on photo-oxidation of nutrients in vegetables placed in retail outlets at different storage conditions" is noteworthy to mention here. The focus of the training was on how lighting conditions influence photo-oxidation of light-sensitive foods. Going forward, I plan to apply such interesting findings/insights in the F&V retail sector in India.

- Archana Lamdande, student from UAS, Dharwad

The IDP investments allow AUs to sort out key challenges and 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 centres both nationally and internationally.**

Under CAAST, I have received training on "Molecular tagging & Localization of microbes in insects" at Agricultural Research Organization, The Volcani Centre, Israel. While incorporating the key learnings from this training, I completed my Ph.D. Research on Whitefly; identified endosymbionts in Bemisia tabaci genetic groups and their relationships with the fitness of B. tabaci.

- Ramesh K.B., student from ICAR-IARI, New Delhi

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 centres will be a boost for technology commercialization of Indian agriculture. Besides, the digital intervention will lead to transform Indian agricultural education into a 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. The 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, Thrissur	**11. NCT of Delhi**	16. IARI, New Delhi
6.	Madhya Pradesh	7. JNKVV, Jabalpur		

b. Key activities undertaken

During FY 2021-22, the major activities and achievements by AUs under CAAST included technology-enabled facilitative centres, development of mobile applications, organization of virtual training programs for students and faculties, the 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 the introduction of pilot courses on emerging areas of agriculture and allied sciences, development of virtual tutorials, development of innovative equipment and machineries, the 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 are also expected to generate internal revenue in the near future through technology commercialization and technology transfer.

"To organize capacity development programs for faculties and students in the field of UAV & to undertake research related to its different applications, MPKV has established a State-in-art UAV Laboratory. Commercialization plan is also in place"
-UAV Laboratory, MPKV Rahuri

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 the 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
NGT-Agriculture Pest Prediction and Advisory (APPA)	• NGT-Agricultural Pest Prediction and Advisory (APPA) UAS, Bangalore Location-based Agricultural Pest Prediction and Advisory to the farming community.	
MP ETp	• To interactively visualize district-wise potential evapotranspiration monthly, the seasonal and annual time scale for Madhya Pradesh https://pspawar71.shinyapps.io/MP_ETp/.	

Jawahar Ganna Mitra	• To provide an online platform for both the sugarcane mill owner and the farmer to easily sell sugarcane in the mill and for the sugarcane mill owner to buy it. http://sugarcanejnkvv.com	
i-Kisan Setu	• Dissemination of timely and needy information on market intelligence for farmers. Along with the generation of the primary data stream from the farmers to enhance the market intelligence. • Farmer/Student and other stakeholders can submit their queries through the application.	
Butting Animal Science (google play store)	• This App has good quality multiple-choice questions for the aspirants of JRF, SRF, ICAR-NET, ARS, various state levels, and other competitive examinations in the subject of Veterinary & Animal Husbandry subjects. • This App contains 7000 questions contributed by the 59 faculties from the length and breadth of the country. • This App could be used in practice as well as in Mock test mode, which gives real-time examination experience.	
Saral	• A web application (https://nahep.nau.in/Courses/) to conduct various competitions.	

'Out of box' initiatives

Partner AUs of CAAST have undertaken various out-of-box initiatives during the period, such as innovative methods through the 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
Discovery Center	• Central Laboratories were developed at IARI for the first time. This facility will boost genomics research and remote drone sensing, and big data analytics and is also being used for conducting training to impart genomics and skills. Monthly hands-on training for IARI students and faculties is being organized at the NAHEP-CAAST Discovery Centre-Drone Remote sensing & Big Data analytics Lab.	
Robotics Laboratory	• To conduct hands-on training for capacity development of faculties and students in research related to the development of track-type remotely operated sprayers for orchid crops, develop an AI-based robotic harvesting machine for picking fruits, and organize the demonstration for farmers through different Agri exhibitions for awareness of technology.	
Unmanned Aerial Vehicles Laboratory	• To conduct research for optimization of different parameters of UAVs like height, speed, swath, etc. is in progress, PG and PhD students are working on a research project related to UAVs like Spraying, UAV-based Imagery etc., and organizing, demonstrating to the farmers through different Agri exhibitions for awareness of technology.	

Initiatives	Brief	Photograph
Hyperspectral Imaging Laboratory	• The Hyperspectral Imaging laboratory aims to assimilate all the strengths of sensors, ground and airborne platforms, remote sensing, and GIS technologies to improve the agriculture sectors, crop advisory, and water management by developing the climate-smart agriculture block.	
IoT and sensor Laboratory	• IoT and sensors laboratory was established in 2021 at CAAST-CSAWM, MPKV, Rahuri, for the development of IoT-enabled and sensor-based technologies.	

c. Output-outcome monitoring

S. No.	Additional monitoring indicators	Baseline	Unit of measure	Till March '22 (Cumulative figures)	
				Plan	Achievement
1.	% increase in the number of technologies commercialized	0	%	4	14
2	% increase in faculty research effectiveness	21.2	h-index value	23.2	29.2
3	Number of direct beneficiaries of the project	0	Number	-	157,230
4	Number of female beneficiaries	0	Number	-	39,163
5	% increase in JRF / SRF / ARS	13	%	14	22.3
6	% increase in the number of students who were admitted to foreign universities	10	%	11	11
7	% increase in PG student placements	3	%	10	5.4
8	Number of industry-sponsored projects and positions in cutting-edge areas of agri-science	32	Number	120	231
9	Number of faculty training programmes (both national and international) undertaken by AU	0	Number	-	1,452
10	Number of student training programmes (both national and international) undertaken by AU	0	Number	-	3,391

As mentioned in the table above, awarded CAAST projects have overachieved on indicators such **as faculty research effectiveness, the 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.), **the percent increase in JRF / SRF / students admitted in foreign universities.**

Under this component, different CoEs have been established in emerging areas of agriculture and allied sector to carry out extensive research, develop the technologies, prepare internationally competitive research articles and collaborate with industries to transfer and commercialize the technologies.

I attended international training at CIMMYT, Mexico, on key emerging themes in the Wheat crop, such as hybridization & hybrid varieties, and research trials of durum wheat resistance against lodging, drought, heat, and rust. In addition to this, I was also trained in the area of landmark genotyping and genome-assisted breeding. Over and above, I also learned about statistical programming tools such as R, which ultimately helped me to qualify and join to a reputed South Asian Institute post submission of my thesis.

- Dr Jagdish Prasad Chaurasiya, student from CSAUAT, Kanpur

d. Input and activity monitoring

Input / Activity indicator	Sub- head / category	Apr'21 to March'22	
		Expenditure / input in INR lakhs	
		Planned	Utilization
Goods and equipment	Equipment, Plant & Machinery	1087.01	466.28
	Office equipment	33.32	14.07
	Laboratory equipment	1495.98	272.66
	Furniture & fixtures	65.02	27.43
	Computers and Peripherals	41.34	18.29
	Books and Journals	47.15	22.88
Civil works	Minor repair and renovation work	541.96	279.91
Human capacity building	National level training	55.92	16.58
	International level training	1326.54	170.13
	Short visit/ seminars	142.27	4.76
	Meetings and workshops	68.51	18.42
Consultancy	National level consultancies	467.38	88.20
Recurrent cost / Miscellaneous	Travel	126.84	20.00
	Contractual services	1763.33	1126.39
	Operational costs	3333.08	1313.39
	Institutional charges	200.62	124.65
Total	**Total**	**10796.27**	**3984.05**

Out of planned **INR 107 Cr** expenditure across key input categories, utilization under the CAAST component is **INR 39 Cr,** which signifies utilization percentage stood at **36.4%** for FY 2021-22. However, specific expenditure heads like **national level consultancies, international level trainings and goods and equipment category** require better planning and execution.
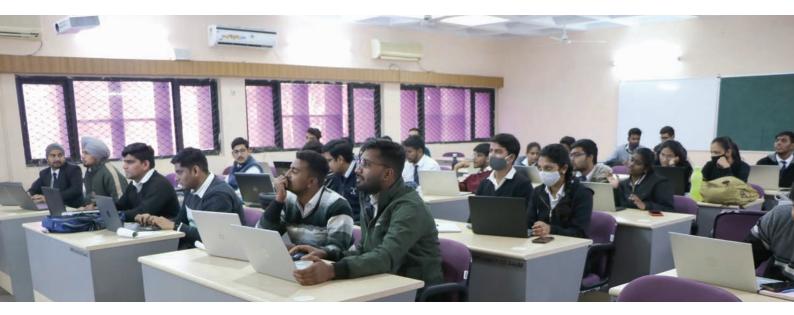
I have received international training at Carbon Management and Sequestration Centre, School of Environment & Natural Resources, The Ohio State University, Columbus, USA. This training programme has helped me to gain experience in the latest technologies in related areas through virtual classes, meetings and seminars. During the training programme, I have also received hands-on working experience with Gas Chromatograph, Photoacoustic greenhouse gas analyzer and CHN analyzer, profile bulk density sampler, and automated penetrometer.

-Dr G. S. Dheri, faculty from PAU, Ludhiana

The holistic approach towards teaching and research for agriculture and rural development, ingrained in this component, would build capacities in a specialized thematic area and cutting-edge agricultural science and make AUs globally competitive and locally relevant. The investments under the CAAST component have contributed to 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.

I have received training on Entrepreneurship and Personality development under the NAHEP project, which helped me to become a confident and successful entrepreneur in the landscape domain. I have also employed several qualified technical staff in my ongoing gardening projects. I have successfully completed several promising landscape projects and gained a recall in the domain for providing Quality and superior customer service.

- Ms. Jhansi Kunta, student from SKLTSHU, Telangana

a) Geographical distribution of partner AUs awarded under IG

Over the years of implementation, IG has awarded the sub-projects to 24 AUs spread across 14 states. The 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, Samastipur	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. KU, Gandhinagar	11. Telangana	16. PVNRTVU, Hyderabad, 17. PJTSAU, Hyderabad, 18. SKLTSHU, Hyderabad
5. Haryana	7. MPHU, Karnal	12. Uttarakhand	19. VCSGUH&F, Bharsar,
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, Cooch Behar, 24. WBUA&FS, Kolkata

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 in virtual mode. For strengthening the digital infrastructure, partner AUs under IG have made significant efforts such as the 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 widened 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
Establishment of LIKES Centre at RAJUVAS, Bikaner	• Livestock Innovation, Knowledge and Entrepreneurship Skills (LIKES) centre established at RAJUVAS, Bikaner.	
Hydroponics and Aeroponics Centre at AU, Kota	• Establishment of hydroponic unit (8 flat aeroponics, 04 NFT, 26 vertical towers) at AU Kota.	

Initiatives	Brief	Photograph
Computer Laboratory	• A computer lab equipped with Language lab software and hardware as well as a Moodle-based E-course facility has been installed for dynamic learning.	
Conference Hall	• A conference hall has been developed for conducting online meetings, trainings, seminars, webinars etc.	

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 online MOOC classes, and 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
Digital Conference Room	• A digital conference room is developed with state-of-the-art equipment and instruments with an enhanced capacity from 35 to 80 persons.	
Video Conference Hall	• Interactive Teaching Device & Video Conference Solution established at College of Horticulture, MHU Karnal Camp at EEI, Nilokher, and at MHU Regional Mushroom Research Centre, Murthal (Sonepat).	
Smart Classroom, NDVASU, Jabalpur	• Smart classroom established at College of Fisheries, NDVASU, Jabalpur.	

c. Output-outcome monitoring

S. No.	Additional monitoring indicators	Baseline	Unit of measure	Till March '22 (Cumulative figures)	
				Plan	Achieve-ment
1	Number of AUs accredited with revised norms and standards of ICAR	55	Number	71	67
2	Number of direct beneficiaries of the project	0	Number	-	43,170
	Number of female beneficiaries	0	Number	-	12,399
3	Number of e- enabled learning activities initiat-ed in AU (MOOC platform, virtual labs, video lectures	-	Number	38	213
4	Number of trainings (national and internation-al) undertaken for faculty upgradation	0	Number	-	509

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.**

As observed in the table above, there have been significant achievements in the number of AUs accreditation since project inception. Out of all non-accredited AUs under the component, 11 AUs have received accreditation after NAHEP implementation.

d. Input and activity monitoring

Input / Activity indi-cator	Sub- head / category	Apr'21 to March'22 Expenditure / input in INR lakhs	
		Planned	Utilization
Goods and equipment	Equipment, Plant & Machinery	0.00	0.00
	Office equipment	31.85	59.09
	Laboratory equipment	110.80	295.54
	Furniture & fixtures	24.66	44.38
	Computers and Peripherals	22.60	38.74
	Books and Journals	26.50	22.97
Civil works	Minor repair and renovation work	15.50	24.66
Human capacity build-ing	National level training	122.87	54.47
	International level training	247.00	22.53
	Short visit/ seminars	118.15	57.46
	Meetings and workshops	101.94	65.85
Consultancy	National level consultancies	0	0.00
Recurrent cost / Miscel-laneous	Travel	102.25	31.70
	Contractual services	395.38	373.43
	Operational costs	428.25	284.24
	Institutional charges	44.70	43.59
Total	Total	1792.44	1418.65

Out of planned **INR 17 Cr** across key input expenditure categories, utilization under the IG component is **INR 14 Cr.** While the utilization percentage stood at **82%** for FY 2021-22, 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, 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 ~66 Crores).**

a. Key activities undertaken

Strengthening of necessary Digital infrastructures by ICAR- IASRI:

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

In order to strengthen the services and infrastructure needs of digital agriculture in the National Agricultural Research and Education System (NARES), the existing Data Centre (ICAR-DC) built-in 2012 is being strengthened with cloud computing infrastructure. Furthermore, under NAHEP, the outreach of the 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
e-Learning Portal	• The E-Learning portal is developed with an objective to strengthen Agriculture Higher Education in India by developing and disseminating the e-courses for undergraduate and postgraduate Agriculture Courses. The portal allows agriculture higher education faculty to develop and revise digital learning content for undergraduate, post-graduate, and Ph.D. courses. 98 courses are completed by March 2022.	

Initiatives	Brief	Photograph
Payment Gateway Integration for AMS	• To facilitate beneficiaries of various online modes of payments, a payment gateway ingratiation is done. As a result, universities can now collect payments via online mode.	
Krishi Vishwavidyalaya Chhatr Alumni Network (KVC ALNET)	• KVC ALNET is an online, workflow-based system developed for the alumni of Agricultural with the objective of facilitating alumni from 75 Agricultural Universities onto a common platform. More than 39000 alumni members registered on the portal. A recruiter login is available for current students and alumni members to view the latest jobs posted by recruiters.	
Agricultural Experts Information System (AEIS)	• This system has been developed with the objective of creating a network of retired and in-service subject matter experts in the agricultural sector and building a repository of the work done by said experts. A database of more than 1054 experts is created for 1595 disciplines.	

Establishment of Facilitative Centres by ICAR-NAARM:

Initiatives	Brief	Photograph
Faculty Development Centre Monitoring System	• Faculty Development Centre Monitoring System was developed to ensure online monitoring of FDC activities, which is a very useful tool for reporting & Monitoring of Faculty Development Centres established at various SAUs and also in upcoming FDCs in future. https://nahep.naarm.org.in/fdc.	

| Disaster Recovery Centre (DRC) | • DRC is an expansion of ICAR-DC at ICAR-IASRI, New Delhi. It is built on cutting-edge technology of industry-standard of Data Centre components of Smart Rack, 804 Cots & 2940 RAM Computing, 225 TB Storage, Hyper-Converged Infrastructure (HCI), 100 Gig Structured, Scalable & Resilient Network Architecture Networking, Global Load Balancer and Cyber Security with Multilayer, cross Hybrid, Advance Threat Protection, Deep Security, DLP, Next Generation Network, and Web Application Firewall. | |

b. Output-outcome monitoring

S. No.	Additional monitoring indicators	Baseline	Unit of measure	Till March '22 *(Cumulative figures)*	
				Plan	Achievement
1	Number of MOUs signed between industry / HEIs and AUs to strengthen their linkages	6	Number	16	20
2	Number of e- enabled learning activities initiated in AU (MOOC platform, virtual labs, video lectures)	-	Number	-	21
3	Number of IDP/CAAST /IG proposals assisted by the education division	0	Number	-	62
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	4	3
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	13	21
7	Number of direct beneficiaries of the project	0	Number	-	16805

As mentioned above, awarded institutes under Component 2 have overachieved on indicators**: 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.** However, component 2 institutes need to strategize further in meeting the planned targets against the **external advisory panel visits to AU for capacity building.**

COVID-19 has accelerated the transformation in education through policy developments and measures to ensure the continuity of teaching and learning for all while prioritizing the health and safety of the education community. It underscores the importance of laying the foundation of institutional resilience by improving the quality and enhancing access to high-quality education and reducing the digital divide through appropriate, effective and interactive digital learning initiatives. Hence, as an important initiative under **Component 2, Resilient Agricultural Education System (RAES)** has been introduced, 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 a Resilient Agricultural Education System (RAES), where the focus will be on strengthening existing Digital infrastructure and online learning platforms in AUs, the development of a discipline-specific Digital Content repository and a system-wise Digital Capacity building program.

c. Input and activity monitoring

Input / Activity indicator	Sub- head / category	Apr'21 to March'22	
		Expenditure / input in INR lakhs	
		Planned	Utilization
Goods and equipment	Equipment, Plant & Machinery	1807	603
	Office equipment	20	0
	Laboratory equipment	4116	1519
	Furniture & fixtures	51	0
	Computers and Peripherals	247	27
	Books and Journals	0	0
Civil works	Minor repair and renovation work	229	7
Human capacity building	National level training	25	0
	International level training	11	0
	Short visit/ seminars	28	0
	Meetings and workshops	76	0
Consultancy	National level consultancies	707	586
Recurrent cost / Miscellaneous	Travel	139	5
	Contractual services	286	231
	Operational costs	615	295
	Institutional charges	63	2
Total	Total	8418	3275

Over last year, project fund utilization for component 2 (including RAES) is **38%, i.e., INR 32.7 Crores out of total INR 84.9 Crores**. The investment under this component intends to strengthen ICAR's governance and management of Agricultural Higher Education in the country through supporting institutional reforms.

This component will enable ICAR to be better equipped for effective coordination, guidance and management of 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:

- Maintenance of Project Implementation Unit and Monitoring and Evaluation Cell to ensure:
  - Compliance with the project's procurement, financial management, and reporting requirements.
  - Carrying out administration, supervision, monitoring and evaluation of projects awarded under IDP, CAAST and IG.
- Providing training to ICAR and participating AUs to achieve and sustain increased quality, relevance, and effectiveness of agricultural higher education.
- 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 the Monitoring and Learning component includes M&E initiation activities, baseline finalization activities, and PMTS and PME-related activities. During the year, the M&E team has taken various initiatives to monitor the project and plan for evaluation effectively.

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

AU Implementation Performance Scoreboard (AUIPS) has been designed in such a way that the physical progress corresponds to the financial utilization, and this will ultimately ensure the effective implementation of NAHEP. It assesses the **Call specific - component specific - AU specific** performance in an objective manner.

Based on the findings of the assessment, component-wise AUs have been classified into three categories in the AUIPS framework: **Strength, Competent, and needs improvement**. Through this initiative, a major objective is to create a competitive spirit among grants and advise them on necessary corrections, 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 a comparative assessment has been made with the highest utilization from the respective component. • On the basis of the comparison of fund utilization, the 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 similar lines of financial management, the procurement performance of each AU has been measured on the basis of Signed / Completed Contracts, and a comparative assessment has been made with the AU with the highest signed/ completed procurement from the 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 and ESM indicators. A comparative assessment has been made with **the overall performance of components against each M&E and select ESM indicators assigned** *(as per the suggestions made by WB in the 6th ISM held in Sept'21).* • In the 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 the respective component's average, the score has been considered as "**1**".

Under this initiative, the Central M&E team has been updating the scoreboard on a quarterly basis, wherein the **AUIPS 1.0 was updated & published in December 2020.** Post-AUIPS 1.0, the Central M&E team has been regularly updating the scores and organizing the regular M&E Clinics for those who have scored below average. During this period, the M&E team updated the scores and published the results of **AUIPS 3.0.** These results were discussed with all the partner AUs during the recent **NAHEP Technical Review-2022 held in May 2022,** and expectations were put forth to further improve the overall implementation performance.

AU Implementation performance Score Board 3.0

Award Call	Name of the AU	AUIPS 3.0				
		FM (Max: 4)	PM (Max: 1)	OOM (Max: 5)	Final Score (Max: 10)	Rating
IDP						
I	JAU, Junagadh	4.0	1.0	3.9	8.9	Strength
I	ANGRAU, Guntur	3.2	1.0	4.3	8.5	Strength
I	AAU, Jorhat	3.2	1.0	3.5	7.7	Strength
I	NDRI, Karnal	3.2	0.6	3.7	7.5	Strength
I	TANUVAS, Chennai	3.2	0.8	3.5	7.5	Strength
I	OUAT, Bhubaneshwar	2.4	0.6	4.3	7.3	Competent
I	CCSHAU, Hisar	2.4	0.6	3.7	6.7	Competent
I	MPUAT, Udaipur	2.4	0.6	3.1	6.1	Competent
II	GBPUAT, Pantnagar	4.0	0.8	3.5	8.3	Strength
II	TNAU, Coimbatore	3.2	1.0	3.5	7.7	Strength
II	UAS, Dharwad	3.2	0.6	3.5	7.3	Competent
II	SKUAST, Kashmir	2.4	0.6	3.9	6.9	Competent
II	GADVASU, Ludhiana	2.4	1.0	2.7	6.1	Competent
III	CAU, Imphal	3.2	1.0	2.5	6.7	Competent
III	SKNAU, Jobner	3.2	1.0	4.3	8.5	Strength
III	RVSKVV, Gwalior	2.4	0.6	2.9	5.9	Competent
III	DUVASU, Mathura	3.2	0.6	1.0	4.8	Needs Improvement
III	YSPUHF, Solan	3.2	0.6	1.0	4.8	Needs Improvement
CAAST						
I	MPKV, Rahuri	4.0	1.0	4.1	9.1	Strength
I	NAU, Navsari	4.0	1.0	3.8	8.8	Strength
I	UAS, Bangalore	4.0	1.0	1.9	6.9	Competent
I	CIFE, Mumbai	4.0	1.0	1.3	6.3	Competent
I	PAU, Ludhiana	4.0	1.0	1.0	6.0	Competent
I	IARI, New Delhi	4.0	1.0	1.0	6.0	Competent
I	IVRI, Izatnagar	2.4	0.6	2.9	5.9	Competent
II	BAU, Ranchi	3.2	0.8	3.4	7.4	Competent
II	VNMKV, Parbhani	4.0	1.0	0.9	5.9	Competent
II	AAU, Anand	4.0	1.0	0.3	5.3	Competent
II	CSK HPKV, Palampur	4.0	1.0	1.0	6.0	Competent
II	KAU, Thrissur	4.0	1.0	1.0	6.0	Competent
III	JNKVV, Jabalpur	4.0	0.4	1.0	5.4	Competent
III	MAFSU, Nagpur	3.4	1.0	1.0	5.4	Competent

Award Call	Name of the AU	AUIPS 3.0				
		FM (Max: 4)	PM (Max: 1)	OOM (Max: 5)	Final Score (Max: 10)	Rating
IG						
II	RLBCAU, Jhansi	4.0	1.0	3.3	8.3	Strength
II	UAS, Raichur,	4.0	1.0	2.1	7.1	Competent
II	WBUAFS, Kolkata	4.0	1.0	1.3	6.3	Competent
II	SKLTSHU, Hyderabad	4.0	1.0	1.0	6.0	Competent
II	ANDUA&T, Ayodhya	4.0	1.0	1.0	6.0	Competent
II	UBKV, Cooch Behar	4.0	1.0	1.0	6.0	Competent
II	Dr RPCAU, Samastipur	4.0	1.0	1.0	6.0	Competent
III	VCSGUKU, Bharsar	4.0	1.0	1.0	6.0	Competent

AUs secured 'Strength' category indicates their comparatively more directional efforts in effective planning and implementation of technical and financial milestones. Compared to the previous year's performance

Post 6th ISM, AUIPS 3.0 scores were generated for each AU and results were shared during NAHEP Technical Review Meeting held in May 2022. There were 13 AUs under the Needs of improvement category in AUIPS 1.0, and now there are only 2 AUs left in the same category in AUIPS 3.0.

In order to keep up the momentum of improving the individual performances along with competitive spirits among partner AUs, the M&E team will be regularly updating & publishing the AUIPS scoreboard.

2. Assessment of students' and faculties' satisfaction

Central M&E team has taken the 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 levels were assessed on the 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 of 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 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 the 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 the national level
	Faculty development program at the 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
Collaboration and linkages	Improved MoU opportunities with the industry for tech transfer and commercialization
	Improved awareness of global/national research collaboration & competitive grant opportunities
Training and capacity building	Faculty development program at the national level
	Faculty development program at the international level
	Subject-matter specialized CB programs

During the year, **2,576** students responded to the satisfaction survey, wherein 2,176 (84%) students were aware of the NAHEP project. Out of 874 respondent faculties, 820 (94%) faculties were aware of the project. Students and faculties who were aware of the NAHEP were further assessed on the aforementioned survey queries. Access to faculty and student satisfaction survey questionnaire.

Placed below are the key findings of the 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	**1.08**
Training and capacity building	25%	**2.24**	3.00	**0.59**
Facilities and infrastructure	30%	**2.28**	3.00	**0.72**
Overall			**3.00**	**2.39**
Previous score				**2.26 (5.4% increase)**
% increase in awareness of NAHEP amongst students				**9% (From 76% to 84%)**

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	**1.01**
Facilities and infrastructure	30%	**2.57**	3.00	**0.79**
Industry collaboration and global experience	30%	**2.45**	3.00	**0.76**
Overall			**3.00**	**2.57**
Previous score				**2.51 (2.3% increase)**
% increase in awareness of NAHEP amongst faculties				**9% (From 90% to 94%)**

*The table depicts that students and faculties are <u>moderate to highly satisfied at the overall level due to the direct & perceived benefits of the program</u>. However, a clear distinction of efforts leading to PDO needs to be established in a 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. **Assessment of AU Autonomy**

In order to address & timely report one of the key IR indicators of the NAHEP RF, i.e. **"AUs that have attained autonomy", the** M&E team has conducted a detailed online survey, and the findings have been shared with **PIU during the Technical Review meeting held in May 2022.** The survey questionnaire comprises various assessment areas to understand the current status of AU autonomy (overall & in 3 specific areas- Academic Autonomy, Administrative Autonomy and Financial Autonomy).

Total 21 survey queries have been administered to respondent AUs.

- Academic: 9
- Administrative: 7
- Financial: 4
- Others: 1

Placed below are the survey queries under each category.

Academic Autonomy	Review (add/upgrade) existing courses/programmes on regular basis? If Yes, what is the frequency?
	Upgrade the existing methods of assessment of student performance, conduct examinations and notification of results on your own?
	Announce results, issue mark sheets, migration, other certificates and award degree certificates?
	Have the full privilege to start the new programs at any level (UG/PG/PhD)?
	Take any initiative to organize the faculty upgradation programs to understand the importance of autonomy?
	Collect the students' feedback? If yes, what is the frequency?
	Collect the Faculties' feedback? If yes, what is the frequency?

Administrative Autonomy	Prescribe and adhere to rules for admission in accordance with the reservation policy of the state government/national policy?
	Fix/amend the fee structure of the courses on your own?
	Constitute your own Governing Body, Academic Council, Board of Studies and Finance Committees?
	Have the full privilege to recruit administrative staff, faculty and scientists and promote them?
	Have adequate infrastructure in terms of classrooms, library books and e-resources, laboratories and equipment, sports facilities, facilities for recreation activities, residential accommodation for faculty and students, transport facilities etc.?
	Have a monitoring cell to assess the activities carried-out by affiliated institutes/colleges?
	Have the full privilege to construct the civil works, develop/ amend infrastructure facilities, and make renovations and repairs on your own?
Financial Autonomy	Average budget of your AU/institute in the last three years? (Please provide figures in INR Crs)
	Average internal revenue generation of your AU/institute in the last three years? (Please provide figures in INR Crores)
	Share of internal revenue generation out of the total budget of your AU/institute? (%)
	Average % fund utilization of expenditure out of total budget outlay of last three years?
	Does the exclusive governing body manage the financial expenses?
	Does this governing body conduct the internal audit time-to-time? If yes, how frequently does your AU/institute have been audited by external auditors in the last FY?
Others	Recognized as 'Deemed to be university' by UGC?
	Have you been granted an autonomous institute by UGC?
	If yes, please share the number of conferment letters received from UGC

Overall, survey response scores were further converted into autonomy points and categories. **AUs with >= 8 point represents "Autonomous", and < 8 represents "Autonomy aspirers"**. The link to the assessment of AU autonomy status has been placed here: questionnaire.

Placed below are the key findings of the AU autonomy assessment conducted during the current reporting period.

Category	No. of AUs	
	2021	**2022**
Autonomous (scored more than or equal to 8 points)	**51%**	**57%**
Autonomy aspirers (scored less than 8 points)	**49%**	**43%**
% increase in AUs that have attained academic autonomy compared to the previous year		**57%**

Due to NAHEP interventions, it is envisaged that a greater number of AUs will secure academic, financial and administrative autonomy in true sense in medium and longer runs.

4.   **Assessment of the measurable intermediate outcomes through a Mid-line survey**

M&E team of NAHEP organised a Midline outcome survey during FY 2021- 22, wherein preliminary findings were presented during **NAHEP Technical Review Meeting-2022.** The intention behind administering this survey is to carry-0ut the perceptual mapping of intermediate outputs and outcomes culminating to NAHEP PDO, develop the basis for economic and financial analyses of impacts and devise the need for mid- course corrections required if any.
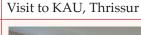
Following are the key excerpts of the survey:

Outcome-focused impact assessment: Sub-project level
From April to June 2022, M&E has undertaken an initiative to carry-out an outcome-focused impact assessment at the AU level with the following objectives.   - Conducting Impact study & Economic analysis of various activities, outputs and outcomes of each subproject of call 1 & call 2 under NAHEP- IDP & CAAST components   - Developing case studies – "What works" & "What doesn't work" & sharing best practices

Visit to MPKV, Rahuri	Visit to KAU, Thrissur
Visit to TNAU, Coimbtore	Visit to TANUVAS, Chennai

To carry out these interactions at the AU level, we developed a detailed structured questionnaire to understand the project-level potential impact of the project. The detailed questionnaire is placed in the annexure.

With-without assessment of intermediate outputs/outcomes of international trainings organized under NAHEP

Total number of students undergone international training

Year	Without NAHEP	With NAHEP
2022	25	362
2021	14	280

Major purposes / expectations from the international training for students (values in Avg., highest score 5)

Purposes / expectations	Without NAHEP	With NAHEP	% increase
Managerial skill development	2.6	3.5	35%
Awareness on market-oriented academics	2.7	2.8	4%
Professional skill development	3.1	3.5	13%

*Sample (number of AUs) **N=42***
Scale: 1-dissatisfied/ least important, 5 satisfied/ most important

Total number of faculties undergone international training

Year	Without NAHEP	With NAHEP
2022	70	122
2021	48	77

Major purposes / expectations from the international training for faculties (values in Avg., highest score 5)

Purposes / expectations	Without NAHEP	With NAHEP	% increase
Improving teaching effectiveness	2.6	3.0	15%
Collaborative research / linkages with foreign universities	3.1	3.4	10%
Improving Research effectiveness	2.8	3.0	7%

With-without assessment of intermediate outputs/outcomes of pilot courses and digital initiatives undertaken

Development of market-oriented pilot courses

Parameter	Without NAHEP 2021	Without NAHEP 2022	% increase	With NAHEP 2021	With NAHEP 2022	% increase
Total number of pilot course curriculums developed	8	13	38%	101	204	50%
Number (~) of students benefitted through such pilot courses	498	733	32%	1,995	4,899	59%

Does the development of such courses were relevant or not? (values in Avg., highest score 5)

Parameter	Without NAHEP	With NAHEP	% increase
To what extent, such courses will upgrade the existing skillsets of students?	3.7	4.4	19%
To what extent, such courses will enhance academic, research and professional competitiveness of students?	4.0	4.4	10%

Digital initiatives undertaken by partner AUs

Parameter	Without NAHEP 2021	Without NAHEP 2022	% increase	With NAHEP 2021	With NAHEP 2022	% increase
Number of web and based applications developed	84	90	7%	89	111	20%
Number of enabling digital infrastructures established to enhance academic excellence (such as AI Lab, Virtual Reality Facility, online learning portal)	27	75	64%	106	171	38%

Sample (number of AUs) **N=42,** Scale: 1 being not at all likely, 5 being most likely

With-without assessment of intermediate outputs/outcomes of establishing facilitative units and MoUs entered under NAHEP

How does the development of facilitative units are being majorly utilized for ? (values in Avg., highest score 5)

Parameter	Without NAHEP	With NAHEP	% increase
Student teaching- learning	3.9	4.7	20%
Research Purposes	3.6	4.4	22%
Administrative Purposes	3.0	3.6	20%

Sample (number of AUs) N=17
Scale: 1 being not at all likely, 5 being most likely

Major purposes / expectations from entering into MoUs with industry / HEIs (values in Avg., highest score 5)

Parameter	Without NAHEP	With NAHEP	% increase
Enhancing academic excellence (teaching-learning)	3.8	4.4	16%
Enhancing research excellence	4.0	4.4	10%
Marketing/Commercialization of technology / innovation	3.2	3.6	13%
Improving job opportunities for students	3.7	4.3	16%
Knowledge exchange	3.9	4.6	18%

With-without assessment of intermediate outputs/outcomes of facilitative units established under NAHEP: A closer view

Number of facilitative units established	
Without NAHEP	**With NAHEP**
51	80

Type of establishments	
Type of units	**Number of units**
Out-of box initiatives (Robotics lab, Digital Clinical services, Climate Resilient Dairy Unit, E-content studio, LAC etc.)	22
Digital Lab/Virtual/Smart Classrooms	18
Upgradation of existing facilities (Classroom, Nethouse, Hactchery Unit)	18
E-Content repository Digital Library, MOOC etc.	9
Placement/Alumni/IIIC Cell	8
Digital Infrastructure (Disaster Recovery, Discovery Centre etc.)	2
Incubation unit	1

Ease of performing the activity

Frequency of usage

Daily	60%
Alternate day	15%
Weekly	9%
Twice in a week	7%
Fortnightly	7%

Assessment of efficiency (lead time) and Beneficiaries

Parameter	Without NAHEP- FU	With NAHEP-FU	% improvement
Avg. time reduction to conduct an assigned activity	3 hrs/day	5 hrs/day	**43%**
Beneficiaries	14K	37K	**61%**

It is envisaged that the project intervention logic of NAHEP would further evolve, scale up, and more tangible & non-tangible impacts would realize in the long run. The same will be recorded during upcoming midline and end-line impact assessment studies.

5. **Assessment of graduate income index after one year – A new IR indicator**

Post restructuring of the project in 2021, the '% increase in graduate income index after 1-year' indicator has been added to the PDO category. Towards the assessment of this indicator, a detailed questionnaire has been prepared with 30 queries to assess the graduate income index of alumni who graduated from awarded AUs last year. A dipstick survey has been organised to collect responses from Alumni. The queries involve

- General and perceptual benefits
- Remuneration benefits and
- Aspirational benefits

Placed below are the survey queries under each category.
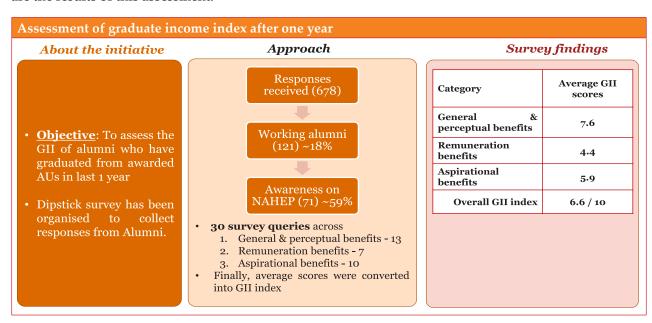
General & perceptual benefits	Are you currently working?
	Are you aware of ICAR- NAHEP project
	Type of employment
	Type of organisation
	Type of 'Private Organisation'
	Fit in hierarchy
	Job location
	Did you change the job after the first job?
	Please provide the total work experience (in years)
	Did the campus placement cell of your AU facilitated during your first Job placement?
	Is it personally rewarding?
	Is it Professionally rewarding?
	Is it Financially rewarding?
Remuneration benefits	What is your current gross income (fixed remuneration component) post-completion of the degree?
	What was your fixed remuneration immediately after joining the organisation?

Remuneration benefits	What is the average share of annual fixed bonuses/perks out of gross income?
	for the same job role/occupation in your organisation
	for the same job in other similar organisation
	for the same hierarchy, experience and education background level in other agri and allied sector/industry
	For the same hierarchy and experience level in other than agri and allied sector such as IT firm, manufacturing firms, banking etc.
Aspirational benefits	Are you planning to continue serving the same organisation for the next one year?
	Are you planning for higher education in the next 2-3 years?
	Remuneration offered by the organisation
	Support in career advancement
	Manageable work-life balance
	Support for higher education
	Prepare for leadership positions
	Developed indispensable skill sets
	Developed professional network
	Satisfied with bonuses and perks

Under this initiative, we have also leveraged our well-established online platform to connect the alumni, i.e. KVC-Alnet. To date, we have received responses from 678 Alumni, out of which 121 (18%) are currently working and of which 71 (59%) are aware of NAHEP and eligible for this assessment.

Overall, survey response scores were further converted into GI Index points and categories. **Placed below are the results of this assessment.**

Assessment of graduate income index after one year

About the initiative

- **Objective**: To assess the GII of alumni who have graduated from awarded AUs in last 1 year

- Dipstick survey has been organised to collect responses from Alumni.

Approach

Responses received (678)

↓

Working alumni (121) ~18%

↓

Awareness on NAHEP (71) ~59%

- **30 survey queries** across
  1. General & perceptual benefits - 13
  2. Remuneration benefits - 7
  3. Aspirational benefits - 10
- Finally, average scores were converted into GII index

Survey findings

Category	Average GII scores
General & perceptual benefits	7.6
Remuneration benefits	4.4
Aspirational benefits	5.9
Overall GII index	6.6 / 10

6. **Knowledge management initiative – development and implementation of KMF and KMP**

Development of Knowledge Management Framework (KMF): For effective implementation of the Knowledge management strategy in NAHEP, there is a need to develop a robust Knowledge management framework (KMF). KMF comprises measurable indices, reporting frequency and a responsible agency/partner to report the indices. KMF will form the base for the development of the knowledge management portal. KM indices have been developed in such a way that these indices could be useful in M&E-related decision-making. The 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.
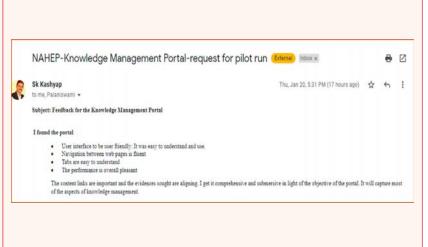
Development and launch of Knowledge Management Portal (KMP): The knowledge management portal (KMP) is a web-based application/page to provide an automated solution to users. Every respondent has their own user credentials to login into the system to interact with the system. In the case of NAHEP, the key functionalities of KMP will be to store data on the 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. The dashboard/output format will be dynamic in nature and will be updated on the basis of input entries.

Activities related to KMP pilot & portal augmentation

Prior to the launch and go-live, the M&E team has requested select AUs for the pilot run and collected the feedback from the same.

- To conduct the pilot run, we have selected two partners AUs and requested to run the pilot by input entries against all indices defined under KMF

- Based on the critical pilot run, partner AUs have provided feedback. Based on the feedback, we have carried out the final amendments in the portal prior to launch.

- Placed here is the feedback from one of the pilots conducted at GBPUAT, Pantnagar

Activities related to the KMP launch and go-live

Post portal augmentation, M&E has organised a virtual KMP demonstration workshop and go-live webinar on 21st January 2022 through virtual mode. Towards the preparation, the M&E team has prepared the detailed concept note and invited all awarded AUs for requisite sensitization and to meet the expectations related to KPM. The event witnessed participation from 62 AUs comprising 80 participants. Here are a few glimpses of the event.

Key achievements on KMF indices (As on 31ˢᵗ March 2022)

#	Measurable KM indices	Achievement (till March 2022)
1.	**Knowledge collaterals**	
	• Research Articles	61
	• Publications	43
	• Books	19
	• Annual Reports	28
	• Success Stories	70
	• Newsletter	75
	• Magazines	14
	• Blogs	141
2	**Mobile and web applications**	
	• Mobile applications developed and link to install uploaded on KMP	14
	• Web applications developed	15
3	**Number of IPR registered/obtained (with upload option)**	
	• Copyrights	11
	• Patents	5
4	**Dissemination and outreach**	
	• No. of Posts on Social Media	29
	• No. of Posts on Newspaper	142
	• No. of Posts on Magazines	0
	• No. of Unique Promotional by PoPs/e-flyers (both physical & virtual)	247

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**., are very well evident and have been presented in the report in detail. These achievement figures confirm that activities at partner AUs are attributed to RF indicators and NAHEP PDO, leading to the increased quality and relevance of agricultural higher education.

It is envisaged *that the **project implementation and intervention logic of NAHEP** would further evolve and scale up. As a result, tangible & non-tangible impacts would realize in the medium and long runs, and the same will be recorded during the impact assessment studies*.

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 for 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 plans, publication notices and contract award information on 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 are 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)

b) 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 the 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 the import of goods or likely participation of foreign firms 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 the 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 is unlikely. Advertisement in at least one News Paper of National Circulation. - publication on the client's web site shall also be done. All other as in ICB

Shopping (National & International)

- For a small number 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 a minimum of three quotations
- For international shopping minimum of three quotations are required from two 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 the RFQ feature

Direct Contracting

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

- Extension of an existing contract for goods/works
- Additional purchases from the 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):

- 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 the selection of consultants 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 and lacks transparency in the selection. Therefore, single-source selection shall be used only in exceptional cases.

iii. Selection of Individual Consultants:

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

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

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

Process status- STEP	Total	% completion
Pending implementation/ Under Implementation	13,226	21%
Signed/ Completed contracts	48,808	79%
Total	62,035	**100%**

As observed in the table above, the 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 during 2021-22.

c) Financial management

The fund utilization of NAHEP has been closely monitored by PIU-NAHEP under the guidance of the National Director. PIU-NAHEP has organized **need-based capacity-building activities and review meetings for awarded AUs to expedite fund utilization**. The cumulative financial utilization progress of the project till March 2022 has been tabulated below:

Particulars			INR (lakhs)			
	2017-18	2018-19	2019-20	2020-21	2021-22	Total
• Funds released by NAHEP to participating AUs	-	20,657	24,137	18,000	22,500	**85,294**
• Fund utilization by participating AUs	-	7,526	15,663	16,975	14598	54,762
% total utilization	-	**36%**	**65%**	**94%**	**65%**	**64%**

There has been a significant increase in the utilization of budget by awarded AUs as compared to the last WB Mid-term review held in September 2020. The cumulative fund utilization for NAHEP has reached 64%, whereas it was 52% during the previous reporting period (Sept'20).

<u>**Component-wise financial progress status**</u> *(Values in INR Lakhs till March 2022)*

Component	Sanctioned budget (till 2019-20)	Cumulative Release	Fund Utilization	% Utilization
IDP	43,649	32,714	22,508	**68%**
CAAST	30,671	26,873	19,675	**73%**
IG	9,824	8,877	7,504	**84%**
Comp2	4,021	12,136	6,717	**55%**
Comp3	-	1,467	1,467	**100%**
Total	**88,165**	**82,069**	**54,762**	**67%**

As observed in the table above, cumulative fund utilization **of IG is highest with >80%, followed by CAAST & IDP with 73% and 68%, respectively. Fund utilization of component 3 against cumulative release stands at 100%.** The timely procurement and finance review meetings and handholding webinars have played an important role in expediting the overall procurement progress and fund utilization.

d) Environmental safeguard measures

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

Environmental Management Framework (EMF): The EMF presents the 'legal and regulatory framework'- a compilation of applicable acts, rules and regulations of GoI that identifies potential environmental risks and presents the mitigation measures along with green initiatives. NAHEP has been implementing in 58 AUs. Out of 58 PAUs, 27 PAUs (under Call-1) started the project activities during the 2018-2019 financial year, while 19 PAUs (under Call-2) and 12 PAUs (under Call-3) initiated the activities during the 2019-2020 financial year. Based on the EMF, the PAUs prepared Environmental Sustainability Plans (ESPs) for the proposed activities under the project.

I. Capacity Building Programme:

Organized three workshops for all AUs as per the aide-memoire and need-based. All the workshops are in virtual mode. The details are given below:

- Refresher Workshop to Call 3 AUs: Virtual refresher workshop was organized on 6th August 2021 for the Universities under Call 3. The objective of the workshop was to share the experiences on ESP implementation and facilitate the AUs on issues faced during the implementation of ESP. The workshop was started by NC – M&E and Nodal officer – ESS and briefed about the workshop objectives and appreciated ES Nodal officer & PIs for their continuous support and success implementation of the project. The nodal officer presented the progress of the ESP on their campus and its challenges. Due pandemic, mostly colleges were closed, and classes through virtual mode.

- Green Building/ Campus Certification: Most Agricultural campuses, by and large, can be considered as green campuses due to greenery, landscape, etc. and resource management and conservation practices which are part of the education. Considering these aspects, to encourage AUs to drive for green building/ campus certification, a virtual workshop was organized on 18 August 2021. Mr Gautam Aswani, a consultant with expertise in the Green Campus/ Building rating system, delivered the lecture on the same. The session focused on the concept of the green building, types of green building certificates, fee particulars and rating structures. He also presented a few case studies which acquired a green rating building certificate by GRIHA, followed by the question-and-answer session.

- Experience Sharing – Environmentally Sustainable Plan (ESP) Implementation process: The workshop was organized on 6th December 2021. The objective of the workshop is to share the experiences of Call 1 AUs on ESP through PPT with Call 2 and Call 3 AUs.

- Call 1 AUs shared their experiences through power point presentation. The presentation broadly covers as given below:

- Legal compliances & mitigation measures, along with the budget incurred

  o Call 1 AUs successfully executed the compliances as per the ESP.

- Green Initiatives, along with the budget incurred

  o All AUs initiated conservation practices such as energy conservation by replacing the LED bulb, installing solar energy and water conservation through installing sensor taps in the toilets, up-grading and renovating water harvesting structures, bore wells, etc., to improve the recharge capacity of groundwater in the campus area. Waste management practices such as segregation as per the colour codes in the labs for chemical/ hazardous waste and municipal solid waste at canteen/ hostels and campus. Massive plantation programmes through students in improving the green cover in and around the campus.

- Education and awareness programme: All AUs conducted awareness programmes among the students inform of painting poster competitions and one-day training programmes on specific issues and staff members on special environmental days

- Most of the AUs raised the issues of lack of budget provision under ESP but were able to manage through operational costs of NAHEP, other programme funds, university grants, etc. MPKV, Rahuri presented their impact of the ESP through carbon emission

II. Legal Compliances and Mitigation Measures:

Proposed legal and mitigation measures as per the ESP developed by 62 AUs and detailed below:

- Call 1 AUs (27) Complied all the compliances and mitigation measures
- Call 2 AUs (19) Complied 98% of compliances and mitigation measures
- Call 3 AUs (12) Complied 90% of compliances and mitigation measures
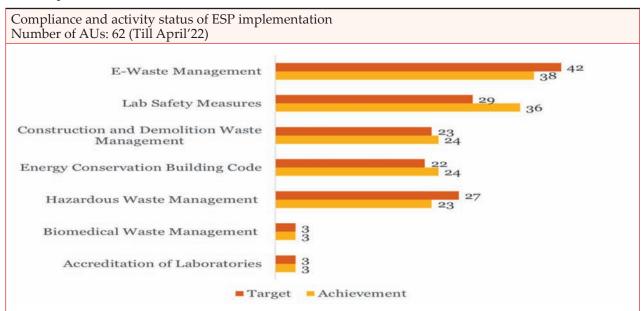- Call 4 AUs (3) Initiated the activities

Hazardous waste management and E-waste management are yet to be complied with. Laboratory safety measures were taken in AUs under renovation works. Details of the compliances are given in table 1.

The contractor also followed the COVID-19 advisory guidelines and provided necessary arrangements for the safety of the workers. Details of compliance with the advisory guidelines are present in table 2. AUs are taken up research work that requires permission from departments concerned or committees such as licenses from the Animal Ethics committee and Biosafety Committee, etc.

Compliance and status of ESP implementation

Regarding the compliances applicable and integrated into ESP, AUs have already adopted the site-specific plan to deal with the environment safeguard issues. In addition, mitigation measures for air and noise pollution were also taken during the renovation work. AUs have adhered to the necessary compliance measures required for appropriate waste management for different types of wastes discharged from various labs at the AU level. Compliances were followed under the recommendations of the 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: 62 (Till April'22)
The aforementioned figures depict that AUs have complied with the ESP implementation except for E-waste and Hazardous waste management against the target. Four AUs who have not accomplished E-Waste management were suggested for E-Waste Auction. Hazardous waste management was still under process, and such AUs belongs to call 3.

Separate vehicles were deputed for Garbage collections from the campus – YSPUH&F, Solan Under NAHEP	E-Bike at UAS Bangalore Campus

COVID -19 Advisory Guidelines:

82% of AUs/ institutions provided information in the local language (on their term & conditions, including hours of work, rest time, and wages) and provision of facilities like potable water, use of the dedicated washroom, first aid, medical facilities, rest shed & emergency plans on health and safety to the workers.

Contractors were provided with the following safety measure procedure as given below:

- No child below the age of 18 will be allowed to work in hazardous circumstances
- Provision for dedicated safe drinking water, sanitary facility and restroom for labour/ labour camp with the minimum required space for each worker- in case of labour staying at the worksite
- Use of Personal Protection Equipment (PPE)
- Health and safety programs for the workers
- Provision of first aid box & medical facility
- Provision of storage (materials) at the construction site with adequate barricades & signboards

A glimpse of safety measures followed during the pandemic

III. Education and Awareness:

Green Technologies and Climate Smart Agriculture:

Name of AU	Green & Climate Smart Agriculture- Technologies
Junagadh Agricultural University, Junagadh	• Agri voltaic system • Smart irrigation system/ Mulching for crop production and sensors for irrigation
Bihar Animal Sciences University, Patna	• Installation of Cow Dung Log Machine
Mahatma Phule Krishi Vidyapeeth, Rahuri	• Climate Resilient Resource Conservation Technologies for Sustainable Sugarcane Production
University of Agricultural Sciences, Bengaluru	• Sensor-based automated irrigation techniques in important agricultural crops
Anand Agricultural University, Anand	• Hydroponic Technology
University of Agricultural Sciences, Raichur	• Pigeon pea Transplanting technique
Dr PDKV, Akola	• Development of battery electric vehicle sprayer
SKUAST, Kashmir	• Nursery raising under controlled environmental conditions

IEC material:

NAHEP developed a booklet titled **'Guidelines for Safe Disposal of Hazardous Waste Generated from Laboratories'. B**ooklet soft copy was uploaded on the NAHEP website. The website link: https://nahep.icar.gov.in/ESSDocuments.aspx.

In addition to the booklet, three posters were developed on Safe disposal of laboratory culture, Safe disposal of hazardous chemical waste, and Segregation bio medical waste. A poster was uploaded to the website during the first week of February 2022.

Awareness Programmes:

All AU organized awareness programmes on environmental-related issues in the form of rallies, door-to-door campaigns at the community level, and mock drills on fire with the authorized department. Some universities conducted competitions on special days such as world Environment Day, World Water day, etc.

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 labour, student, teaching and non-teaching staff, a labour-management plan has been developed and implemented for civil construction work.

I. Capacity Building of Nodal officers

National level workshop

Two National workshops on social safeguard were organized at ICAR-NAARM, Hyderabad, for principal investigators/ co-investigators of NAHEP, nodal officers and faculty members of partner AUs. The first workshop on "Effective Implementation of Social Safeguard Plans" was organized by the ICAR-National Academy of Agricultural Research Management, Hyderabad, from 23rd-24th July 2021. The workshop was organized as a part of the World Bank-sponsored National Agricultural Higher Education Project Component-2A. The

objective of the workshops was to create awareness of the meaning, need, and importance of the social safeguard techniques, including planning, provisions, principles and implementation of social safeguard policies and mitigation measures under NAHEP. Around 39 participants, including principal investigators/co-investigators of NAHEP, nodal officers and faculty members of the state agricultural universities from 13 States, participated in the training workshop. The second workshop on "Education Management and Academic Leadership" was organized by the ICAR-National Academy of Agricultural Research Management, Hyderabad, from 23rd-28th September 2021. This workshop was conducted to provide an opportunity for faculties/nodal officers/PIs to share their experiences in improving the leadership quality of faculties.

Details of the capacity building are provided in the following Table

S.No.	Workshop conducted	Venue	Date	No. of AUs represented	Number of Participants
1.	National Level Virtual Workshop	ICAR-NAARM	23rd-24th July 2021	13	39
2.	National Level Virtual Workshop	ICAR-NAARM	23rd-28th September 2021	11	23
Total				**24**	**62**

II. Equity Action Plan (EAP)

EAP is prepared in line with the Government of India's commitment to Inclusive Growth, in compliance EAP is prepared in line with the Government of India's commitment to Inclusive Growth, and in complying 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.

III. Preparation and implementation of EAP

All 62 awarded AUs (Call- I: 27, Call-II: 19 and Call-III: 12: Call IV:4) submitted EAP in the prescribed format, as per their proposal and implemented.
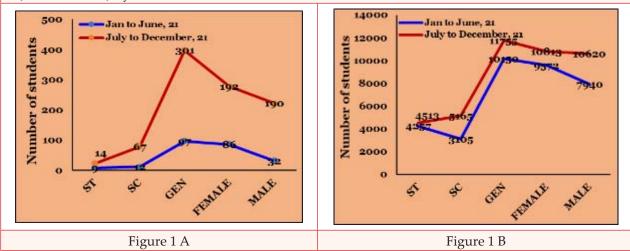
Capacity-building programs for students

Scheduled Tribes (ST), Scheduled Castes (SC) and female students have been integrated into all the projects. However, some AUs have been facing problems in ensuring 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. From July to December 2021, a total of 382 students, comprising 14 from ST, 67 from the SC and the rest 301 from the General category, attended overseas training from 07 Universities. The gender-wise distribution shows that 192 female students had undergone Overseas trainings against 190 male students. From January to June 2021, a total of 86 female and 32 male candidates participated in oversea training (through virtual mode). Figure 1A depicted a comparison between two semesters (Jan to June 21 and July to December 21) regarding the number of students who attended overseas trainings. It is found that a higher no of students from each category attended overseas trainings from July to December 21 as compared to Jan to June 21. A similar pattern was observed in national-level trainings (Figure 1B).

Here is a brief snapshot of achievements made for the academically weak students under NAHEP:

Particular	January to June 2021 (Through virtual mode)						July to December 2021 (Through hybrid mode)					
	Caste			Gender			Caste			Gender		
	ST	SC	Gen	F	M	Total	ST	SC	Gen	F	M	Total
Overseas Training	9	12	97	86	32	118	14	67	301	192	190	382
Contribution (%)	7.6	10.2	82.2	72.9	27.1	100	3.7	17.5	78.8	50.3	49.7	100
National Level Trainings	4257	3105	10150	9572	7940	17512	4513	5165	11755	10813	10620	21433
Contribution (%)	24.3	17.7	58.0	54.7	45.3	100	21.1	24.1	54.8	50.5	49.5	100

Comparison of student's contribution in overseas (1 A) and national level (1 B) trainings between January to June 2021 and July to December 2021

Figure 1 A	Figure 1 B

IV. Improving the performance of academically weaker students

As a part of the social safeguard, several interventions have been taken by the partnering AUs to ensure good performance of academically weak students and achievement of post-college goals. Interventions like English classes, peer group leanings, student teacher mentoring, and remedial sessions have been promulgated to address the language and communication constraints among students of weaker sections and special efforts for internships/placements. Most AUs have initiated training and motivational classes to enhance their leadership qualities and achievements. A total of 9695 students have benefitted through various capacity-building programs from July to December 2021 at the university level, out of which 4591 (47.4%) were female and 5104 (52.6%) were male students. Caste-wise distribution showed the contribution of ST, SC and Girl students were 13.2%, 21.4 % and 65.5%. The below table shows that the percentage contribution of ST, SC, and female students were 25.8 %, 20.9 % and 45.1 % in university-level trainings.

Here is a brief snapshot of achievements of social inclusion made under NAHEP:

| Particulars | January to June 2021 | | | | | | July to December 2021 | | | | | |
| | Caste | | | Gender | | | Caste | | | Gender | | |
	ST	SC	Gen	F	M	Total	ST	SC	Gen	F	M	Total
Trainings at the University level												
Student identified as weak in English	85	213	260	227	331	558	67	278	748	434	659	1093
Academically weak students	200	117	408	310	415	725	107	259	546	373	539	912
Remedial Class	244	132	436	367	445	812	19	187	227	201	232	433
Student Teacher mentoring	9	9	71	14	75	89	7	9	55	18	53	71
Peer group	4	5	5	4	10	14	-	-	-	-	-	-
Special efforts for internship/ placement	512	440	488	688	752	1440	178	320	448	390	536	946
Communication & Presentation Skills	604	424	1760	1289	1499	2788	206	1209	4845	2675	3585	6260
Total	1658	1340	3428	2899	3527	6426	1284	2462	5949	4591	5104	9695
Contribution (%)	25.8	20.9	53.3	45.1	54.9	100	13.2	21.4	65.5	47.4	52.6	100

V. Faculties' capacity-building program

Subject knowledge up-gradation nationally or internationally is to make the faculty aware of the advances in knowledge, technology, and research methodologies to improve their performance and teaching quality. NAHEP has been supporting faculty to improve their knowledge, pedagogical skills, and sensitivity to gender equality and social inclusion issues in agriculture educational institutions through overseas & national level trainings. From July to December 2021, a total of 4654 faculty have participated so far in overseas and national level training programs, out of which 1299 (27.9%) were female, and 3355 (72.1%) were male faculty. Out of 4654, 4642 faculties participated in national level trainings, and 12 faculties in overseas trainings. Contribution to oversea and national level trainings by ST, SC and Gen faculty was 4.0%, 10.6% and 85.4%. From January to June 2021, total 848 faculty have participated in overseas and national level trainings. Out of the total, 32.1% were female, and 67.9% were male faculty.

Here is a brief snapshot of achievements of social inclusion made under NAHEP: Faculties

| Particulars | January to June 2021 | | | | | | July to December 2021 | | | | | |
	ST	SC	Gen	F	M	Total	ST	SC	Gen	F	M	Total
Oversea Training	11	11	122	44	100	144*	2	3	7	5	7	12**
National level Training	35	70	599	229	475	704	185	490	3967	1294	3348	4642
Total	46	81	720	273	575	848	187	493	3974	1299	3355	4654
Contribution (%)	5.5	9.6	84.9	32.1	67.9	100	4.0	10.6	85.4	27.9	72.1	100
*Hybrid mode, ** Physical 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, Escalator, Signboard, Mock drill, Wheelchair, installed Street lights, and 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 six months of project commencement. As an initiative for user-friendly campus, 09 AUs have established 44 ramps, 07 AUs modified 16 user-friendly washrooms, 04 AUs arranged 11 wheelchairs for people with disability (PWD), 03 AUs arranged 03 mock drills, 01 universities installed 30 CCTV cameras to enhance the security of women and installed 22 napkins vending machine for safe disposal of sanitary napkins by 07 AUs, and 06 AUs established 36 signboards. NAHEP made it mandatory to provide ramps under renovation work. Details of user-friendly infrastructures developed by the AUs under NAHEP are given in the below table.

User-friendly infrastructure, till December 2021

Particulars (No.)	No. of infrastructures	No of AUs developed infrastructures
Ramps	208	29
Washroom	275	25
Napkin vending machine	61	23
Incinerator for safe disposal of napkins	15	10
CCTV	542	12
Escalator	17	15
Wheelchair	100	14
Mock drill	31	22
Signboard	697	35
Streetlights	383	19
Alarm/hooter	2	2

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 is of prime concern for the AU/ Institution. The Head of the institution, along with the site engineer and the contractor / sub-contractor, is ensuring and managing safety provisions through the implementation of the Labour Management Plan (LMP). Partnering AUs have been following the rules and regulations of the state government. Under this, 44 AUs have executed 237 civil works till December 2021 out of 62 awarded AUs.

Performance monitoring on Social Safeguard indicators

Assessment of the performance of NAHEP on SS indicators has been summarized below:

S. No.	Particulars	Apr'21 to March'22	
		Plan	Achievement
1.	Number of courses/seminars/workshops /lectures on social aspects	104	328
2.	Number of documents with thrust on social / equity (papers, reading material, etc.) developed by faculties resulting from exposure within or outside the country	151	195
3.	Number of guest faculties delivering lectures or lessons on social / equity aspects	173	506
4.	EAP (Equity Action Plan) prepared and implemented	62	62
5.	Labor Management Plan prepared and implemented during civil works (renovation)	171	195
6.	Grievance Redress Mechanism (GRM) prepared and addressed complaints within the stipulated time according to the GRM portal	-	29
7.	SC / ST beneficiaries	18.8	18.8

IV. Learnings and Way Ahead

The learnings made during the last FY 2021-22 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 the last year of implementation, IDP sub-projects have continued the virtual/online mode of education as a supplement to the regular mode of academic activities. This transformation has occurred due to restrictions of social distancing measures imposed by the government during the first half of FY 2021-22. However, due to the adoption of the online mode of academics, institutions have continued to be engaged in developing e-content, online examination platforms, conducting webinars etc. and were able to continue the academic activities without disruptions.

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

Over and above, awarded AUs have made timely efforts in reporting their achievements, success stories of students and faculty, testimonials of students and faculty, out-of-box initiatives, digital/virtual initiatives, etc. Such accomplishments and activities were also further compiled and documented as the learnings at component as well as PIU level and have been published for broader circulations.

Partner AUs have procured digital language lab software, strengthened state-of-the-art computer labs with virtual learning modules, modernised UG classrooms, developed skill development programs (training on personality development & other soft-skill development etc.), and remedial courses for weaker sections of students.

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

a. Continuing the international training for students and faculties

Partner AUs have planned for international training and exposure visits for the students and faculties on various emerging areas in the agri and allied domain, which was on hold due to the ban on international travel by the government.

b. Further 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 further strengthening the existing infrastructure and are acclimatizing fast to meet the global standard of higher education for the students. Efforts are being undertaken to institutionalize the transformational interventions made in order to have a sustained impact. Partner AUs have started using the facilities (Laboratories, Smart classrooms & Language labs) effectively and providing training and building the capacity of students (COATA, AR and VR).

c. Curriculum and skill development for students:

The focus will be entrepreneurship, vocational, skill development, internship programmes, and exposure training for students in national and international institutes.

There will be increased efforts to integrate the new advanced courses into the UG course curriculum and off-campus exposure to students. Using the established language lab to improve students' English, French, German and Spanish proficiency skills will also be on the priority list of activities.

d. Faculty upgradation:

Catalyzing collaborations through alumni-faculty at foreign universities (student exchanges, adjunct faculty, virtual classrooms, etc. National and International training for the faculties. Capacity building on governance for top-level administrators & heads of departments.

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 the 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 a dual degree with reputed foreign universities.
- Leveraging state-of-art referral laboratory facilities for the dairy and food industry at competitive commercial terms for revenue generation.
- Leveraging research facilities and business incubation setups for improving entrepreneurship among students of partner dairy science colleges.
- Workshop and national internship on entrepreneurship and skill development of students
- Strengthening of Alumni cell
- Strengthening of Placement cell
- More number of exposure visits, workshops, seminars, and alumni meet will be conducted in physical mode
- Producing more number of agri-entrepreneurs

B. Component 1b

Learnings: During FY 2021-22, partner AUs under CAAST have been engaged in further improving and adding new digital infrastructure, organising faculty upgradation and student training programs in various thematic areas in the presence of domain and industry experts, updated curriculum & developed learning aids for Masters & Ph.D. programs, collaborated with national and international centres of excellence and conducted skill development programs for entrepreneurs, farmers & other stakeholders, developed several mobile apps and web applications to ease the access to knowledge and dissemination of knowledge. In addition, most of the AUs were also actively involved in strengthening the academia-industry interface for preparing industry-ready students, creating entrepreneurs and co-development of technologies, 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 expanded and improved farm and laboratory facilities to promote the scope and opportunity for modern and relevant research, introduction of the new seed varieties, farm equipment aggregation platform, innovative farming practices, dissemination of digital interventions, new teaching/learning material and smart classroom facilities have initiated and encouraged the execution of digitally interactive platform under NAHEP - CAAST have been remarkable achievements this year due to such collaborations. Partner AUs have also developed several energy-efficient and eco-friendly technologies, developed products and commercialised them, and established several facilitative units to enable academic and research infrastructure for enhanced teaching and learning.

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 training, 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
f. Focus on conducting personality, skill and capacity development programmes for students, faculties, extension workers/KVK scientists as per the commitment and project plan
g. Focus on enhancing outreach activities through farmers-scientists interface/webinars
h. Continue foreign exposure visits of faculty and students, which were on hold due to Covid-19 restriction

i. Signing new MoUs with national and international organisations

j. Develop new certificate courses for entrepreneurship and industry-ready programs

k. Transfer of developed technologies to KVKs, Government Departments, NGOs and farmers

l. Refinement of processing/quality analysis of various products and technologies developed

m. Revenue generation from the developed technologies, e.g. Agri-Bots, Agri-Drones, Agri-AGV, CDKS, SSPN, SPM, FPA, IC and others

n. Support green technologies activities on campus and enhance social safeguard activities

o. MoUs with national/international institutes, MNCs and national industries

C. Component 1c

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

Way ahead:

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

   • Upgradation of academic skills of staff/students through training, workshops, seminars etc.

   • The facilities created through NAHEP will be used for capacity building and skill development of the student in renewable energy

   • Faculty upgrade in use of ICT tools & latest information on the subjects in better presentation, delivery and communication

   • Human Capacity Building: Students and Faculty would undertake international/national training on advanced technologies

b. **Courses/Short Visits/Research/Seminars/Workshops**:

   • Carrier-oriented new short courses/programs

   • Organisation of training, workshops and webinars for students and faculty

   • Short exposure visits and training under HRD

   • Commencement of short-term courses in protected cultivation and hydroponics

   • Initiation of research work on hydroponic technology

   • Sensitization workshops to promote KM Initiatives of ICAR, Altmetrics, capacity building programs for Library Professionals to encourage effective use of Digital Information Sources

   • Conducting industry seminars and professional workshops from experts to better prepare students for final placements, soft skill development through collaborative mode (National and International levels), Personality development and grooming centre

c. **Strengthening of Infrastructure**:

   • Strengthening and establishment of new Facilitative units

   • Strengthening and renovation of experiential learning laboratories

   • Installation of all the equipment and accessories in the smart classrooms and incubation centres to make them functional

   • Library Automation, strengthening of library facilities, including E-resources

   • Develop infrastructure including modern digital technology

   • Renovation of shade-nets / poly houses / tunnels

   • Development of e-Learning content, creation and management of students and alumni database/ portal for making a more comprehensive and effective alumni network

d. **Linkages and interactions**:
- Mentoring faculty & Students by Alumni and International faculty
- National & International training for Human Resource Development
- Strong linkages with nationally and internationally renowned expert institutes will be established through MOUs for exposure and research of faculty/students

e. **Entrepreneurship development**:
- Entrepreneurship orientation and personality development for students and hands-on training for encouraging entrepreneurial activities
- Training and exposure to stakeholders/entrepreneurs/farmers

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 a pivotal step in developing, designing and successful implementation of more than ten 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 the 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. Therefore, NAHEP is Promoting a Resilient Agricultural Education System (RAES), where the focus will be on strengthening existing Digital infrastructure and online learning platforms in AUs, developing a discipline-specific Digital Content repository and a system-wise Digital Capacity building program.

Way ahead: A few of identified strategies for better implementation are as follows:
- Plan to organize International Conference and Exhibition on Blended Learning Ecosystem for Higher Education in Agriculture in October 2022
- Procurements under RAES, BLP, International Conference, AR/VR, etc.
- Very few items are to be procured – Furniture & Fixtures, Computers & Peripherals, Minor repair & renovations works, etc. will be taken up after revalidation of the budget
- Implementation of Academia and Industrial Linkage Models
- Publication of policy paper on conducting the online examination in agriculture
- Conduct a comprehensive study of global digital solutions in agricultural education
- Enhancement, implementation and increase in the utilization of AMS, AU-PIMS, KVC-ALNET, AEIS and Agri-DIKSHA
- Continuous Monitoring of CDC/FDC activities
- Activities linked with COVID challenges will be taken up
- Consolidation of outcomes – documentation of all activities

E. Component 3

- *Learnings:* In addition to regular monitoring of sub-projects through the **Project Monitoring and Tracking System (PMTS)**, the M&E team of NAHEP has taken other important initiatives as well during the 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, Assessment of AU Autonomy, Assessment of graduate income index after one year – A new IR indicator, Development and go-live of Knowledge Management Portal (KMP) etc.

- **In addition, PIU has also undertaken other key initiatives such as organizing Kritagya Hackathon 2.0, Clean and Green Campus awards, Waste to Wealth project etc.**

- One of the important initiatives-75 Guest Lecture Series on the occasion of Azadi Ka Amrit Mahotsav under NAHEP. Many topics are covered and delivered by eminent personalities from the Government, Development agencies, Ministers, Progressive Farmers, Spiritual influencers etc.

Way ahead:

a. Ongoing monitoring, evaluation and related capacity-building initiatives,

b. Development of Knowledge Collaterals and document key learnings, achievements and other key initiatives

c. **Clean and Green Campus Awards 2.0:** After the successful completion of 1.0, PIU has planned to organise the 2.0 awards for partner AUs. Towards the preparation for c.   Clean and Green Campus Awards 2.0, a new portal, is being developed to collect registration entries from participants. An event is likely to announce in July 2022

d. **Organising National level Hackathon KRITAGYA 3.0:** Post successful conduction of KRITAGYA 2.0 during the period, now PIU has planned to organise KRITAGYA 3.0 to provide an opportunity for students to present their innovative approaches & potential solutions in crop sciences in India. The event is planned to launch in August 2022.

e. **Study on Assessment of Human Resource Requirement in Agriculture and Allied Sectors for next 20 years**: During the year, PIU has undertaken this strategic initiative, and regular review, submission of quarterly progress reports and inception report were submitted to PIU. The study is currently in the final stage and is likely to submit the final report by September 2022.

f. **Prepare a model DPR to achieve top 200 global rankings within the next three years and for IARI as a candidate Institute:** During the period, a report on the current state assessment of IARI report of gap assessment was submitted to PIU. The study is currently in the final stage and is expected to submit the final model DPR in the next couple of years.

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.

V. Key initiatives undertaken by PIU-NAHEP during the period

Green and Clean Campus Award initiative by PIU-NAHEP

Greening the campus is all about turning around wasteful inefficiencies and using conventional energy sources for its daily power needs, correct disposal handling, purchase of environment-friendly supplies and an 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 to develop a clean and green campus.

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

A web portal was developed for online registration and submitting of the document

Web address: https://nahep.icar.gov.in/greencleancampus/

Evaluation of the Green and Clean Campus Award 2021-22

- A committee was constituted consisting of five external experts, all NCs and Finance and Accounts Officer. Committee decided the parameters and weights for scoring and shortlisting the candidate AUs eligible for the award.
- The committee held five meetings, wherein it oversaw the format for and process of notification, screening, evaluation and scoring of nominations. It shortlisted the first five ranks among the 31 applicants for consideration for the award for Green and Clean Campus.

Post evaluation, winners of the award were felicitated by Hon'ble Prime Minister of India- Shri Narendra Modi, along with other dignitaries on 28th September 2021 during VC's and Director's Conference-2021 through virtual mode.

Here is the list of award winners

1. AU, Ludhiana, Punjab

2. TNAU, Coimbatore, TN

3. CIFE, Mumbai, Maharashtra

4. UAS Dharwad, Karnataka (consolation prize)

Waste to Wealth initiative by PIU-NAHEP

PIU NAHEP came up with the proposal of the 'Waste to Wealth' programme under the NAHEP, which would help the students' entrepreneurship by development and translation into action innovative ideas for converting waste to wealth.

The partnering AUs will prepare and submit a concept note on the possible novel conversion of common but difficult to handle agricultural such as- Agro-industrial waste and organic wastes (by-products from crop harvest, crop debris (stalks and stubble (stems), leaves, and seed pods), residues (bamboo, rice husk, jute, coconut coirs, bagasse, wheat straw, chir pine needles, cotton stalks, casuarina leaves, banana stem etc.,)

Eligibility Criteria:

- Participation will be limited to only existing partners (including those who have completed projects under IG) in the NAHEP
- The applicant AU should have proven expertise in the subject area of converting waste into wealth on a commercial scale with documental proof in support.
- Applicant AU has linkage with Industries in bio-degradable agricultural waste conversion/ recycling.
- Experience in involving stakeholders (particularly farmers/ fishers) in commercial biodegradable waste conversion.
- Project duration: One year
- Budget: one to three crores based on the proposal

Out of 53 concept notes received, 10 AUs were shortlisted and asked to develop proposals. Out of these, seven were recommended by AHEPC for consideration by PMC. Finally, three projects were approved and awarded.

S.No	Awardee AU	Sub-Project title
1	**IGKV, Raipur**	Linen from Linseed Stalks
2	**PJTSAU, Hyderabad**	Black Soldier Mediated Bioconversion of Organic Waste to Black Gold
3	**UAS, Bangalore**	Establishment of Pilot Scale Demonstration Plant for Production of Microbial Inoculants Using Corn Cob as Carrier

Promoting innovation in farm mechanization

KRITAGYA – A national level Agtech Hackathon 1.0	
Objective: This event will give an opportunity to the students/faculties/entrepreneurs/innovators, and others to showcase their innovative approaches & technology solutions to promote innovation in precision farming in India. PIU-NAHEP has undertaken this initiative in association with the Agricultural Engineering Division of ICAR. In order to provide an opportunity for students to present their innovative approaches & potential solutions for promoting Farm Mechanisation in India.	
Brief: ~800 teams registered for the event, with more than 2,500 participants spread across 30 states of the country. Involved two-tier evaluation framework (Zonal & National), and finally, four teams were selected and felicitated during the award ceremony	
Results of KRIATGYA 1.0	

Rank	1
Team Name	**TEAM0164: Fly Cocobot**
Problem Statement	Robotic harvesting of coconut/oil palm
Solution offered	Harvesting of coconuts/oil palms with the help of drones
Rank	2
Team Name	**TEAM0146: Einstein Warriors**
Problem Statement	Real-time detection of plant diseases and simultaneous site-specific application of pesticides
Solution offered	Insect species rely on vibration signals to interact with co- and hetero specifics. Vibrations can be used to either manipulate insect behaviours in order to control pest attack
Rank	3
Team Name	**TEAM0059: Sericrop Innovators**
Problem Statement	Women-friendly equipment for small farm operations
Solution offered	Battery powered portable cocoon harvester is a hand-operated mechanism
Rank	3
Team Name	**TEAM00390: Fishmech innovators**
Problem Statement	Women-friendly equipment for small farm operations
Solution offered	Semi-automatic cutter will bring down the problems faced by the fisherwomen and develop a new cutter for dried fish

Award ceremony chaired by Shri. Narendra Singh Tomar, Minister of MoAF&W and Shri Parshottam Rupala, Hon'ble MoS for Panchayati Raj, Agriculture and Farmers Welfare on 31st May 2021

Precision & Economical Animal Farming

KRITAGYA – A national level Agtech Hackathon 2.0

Objective: This event will give an opportunity to the students/faculties/entrepreneurs/innovators, and others to showcase their innovative approaches & technology solutions to promote livestock farming in India. PIU has undertaken this initiative in association with the Animal Science Division of ICAR

Brief: A total of 269 teams have registered their entries for this hackathon. These entries were received from 25 states with a total number of 1,974 participants. Final results were announced on 13th April 2022

Results of KRIATGYA 1.0

Rank	1
Team Name	**TEAM02013: HANSPATIKA (Make sure you drink pure and safe Milk)**
Problem Statement	Multianalyte and high throughput milk and milk product testing
Solution offered	Nanotechnology-based two sets of dipstick for the detection of multiple milk adulterants were developed.
Rank	2
Team Name	**TEAM02005: FARM DIARY**
Problem Statement	Real-time animal data recording under field conditions
Solution offered	Mobile app which has all data related to cattle farming such as breeding, health, calving, feeding & production, which will give alerts to farmers and request for the service
Rank	2
Team Name	**TEAM02094: PUKAR**
Problem Statement	Innovative methods for animal identification and traceability
Solution offered	A 15-digit alpha-numeric nomenclature system has been developed with a chip tagged in the animal and a certificate to the owners to prevent animal trafficking and to track the origin of the animal in a more reliable way.
Rank	3
Team Name	**TEAM01958: Ecolift Technology**
Problem Statement	Digital/analogue tools for disease diagnosis
Solution offered	A digital application for early prediction of mastitis in dairy animals based on an algorithm to read and compare the prefeed data to analyse and diagnose mastitis.

Assessment of Human Resource Requirement in Agri and Allied sector for next 20 years

To determine the current, latent and future potential requirements of human resources in India along with a holistic demand-supply estimation, a study under NAHEP has been undertaken-" Assessing the requirement of human resources in agriculture and allied fields for next 20 years".

- Looking at the intended outcomes of NAHEP, the much-needed impetus has been laid upon to conduct an assessment of the Human Resource (HR) requirement study under the ambit of ICAR NAHEP. This study will further aid in the ongoing implementation efforts of NAHEP through possible alignment of project activities meeting HR demand potentials of sub-sectors, related project advisories & orienting impact assessment study and bringing more directional efforts in the overall implementation of NAHEP, leading to the achievement of key project outcomes such as improved student placement rates & entrepreneurship, enhanced industry-sponsored projects in cutting edge areas etc.
- With an understanding of the New Education Policy-2020, where high impetus has been given for effective implementation of policy to improve the quality of education. In this context, NAHEP, in association with World Bank, has decided to conduct this study and understand the actual human resource requirement, skills available vs required by the industry, existing relevancy of curricula delivery basis on industry needs, etc.

Objective:

- As is Assessment: Industry overview and human resource market trends
- Potential of employment needs and preferences towards Agri and allied sector
- Human resource requirement forecast over a period of the next 20 years
- Strategic roadmap and action plan

Progress so far:

- Finalizing the approach and methodology, collection of data from primary through a structured and semi-structured questionnaire. Collecting and analysing the information from secondary sources like ICAR-AED, CMIE, ILO, literature review etc.
- Assessing skill gaps, supply and demand estimation for current as well as forecasted period
- Submission of inception and regular quarterly progress report

Way forward:

- Analysis and validation of information collected from secondary and primary sources
- Finalizing the strategic action plan for the forecasted period
- Submission of the final report of the study

Prepare a model DPR to achieve top 200 global rankings within the next three years and for IARI as a candidate Institute

Objective:

- Review the current state of university readiness for global rankings through a detailed assessment of relevant global ranking requirements and IARI's processes & achievements on various parameters

- Highlight gaps with respect to key parameters & process elements of relevant global rankings

- Benchmark against top peer institutes to identify gaps and success criteria for top-ranked universities

- Develop a detailed project report highlighting the improvement areas, operational plan for various areas, resource and financial implications

- Help IARI top management finalize the recommendations on initiatives/activities in various areas to achieve the rankings, including financial projections; if any

- Provide a clear roadmap (resource/cost/timeline) of implementing the initiative - highlighting key challenges, inter-dependencies, and risks while trying to implement the recommendation

Progress so far:

- Report on Current state assessment of IARI readiness to achieve the relevant global rankings

- Workshop with IARI key stakeholders on global rankings and the EY approach to this project

- Report on Gap Assessment with respect to relevant parameters for global rankings

Way forward:

- Prepare Global Ranking Readiness Framework

- Preparation of Detailed Project Report (DPR)

Azadi Ka Amrit Mahotsav: 75-ICAR Lecture Series

- ICAR has been celebrating India's 75th Independence Year with one of its key initiatives 'Azadi Ka Amrut Mohatsav: 75 Guest Lecture Series' under NAHEP

- Till March 2022, 50 lectures have been carried out through virtual mode, and a recording of each lecture event has been published on the official YouTube channel of ICAR

- The lectures were delivered by eminent speakers of respective domains throughout the series.

- There are a variety of topics covered and delivered by eminent personalities from the Government, Development agencies, Ministers, Progressive Farmers, Spiritual influencers etc.

Annexure

A. AU wise detailed activities undertaken

Component 1 A (IDP)

I. ICAR-National Dairy Research Institute, Karnal

Project Title: Incentivizing dairy education through an innovative learning approach

There are multiple activities carried out by ICAR-NDRI, Karnal, during this period. Out of the total budget, the institute has utilized 49% budget. Students have completed the overseas internship, students secured admission in overseas universities, faculty completed international training, and linkages were established with foreign universities. MOOCs developed in dairy processing and dairy production, and smart classrooms developed. MOUs signed with IRMA< IIFPT and Nestle are a few of the key activities and initiatives undertaken by NDRI during FY 2021-22 through innovative learning approaches.

Exhibit: Key activities	
Launch of MOOCs on Dairy Production subjects	NDRI Global Alumni Scientific Meet

II. CCS Haryana Agricultural University, Hisar

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

Under NAHEP, CCS Haryana Agricultural University (HAU) is implementing Institutional Development Plan (IDP). Partner AU students and faculties underwent for overseas trainings, conducted university-industry linkages conclave, developed skill development training, started certificate courses, upgraded lecture halls into smart lecture rooms, and organised training with agribusiness incubation centre. Over the 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	Modernization of labs by partner AU

III. Maharana Pratap University of Agriculture and Technology, Udaipur

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

The AU has utilized 46.39% of the total budget as planned. Students completed international training, faculties underwent for international exposure visits, several pilot courses were introduced, and undergraduate students started start-ups are some of the key initiatives carried out by AU.

Exhibit: Key activities

Students went for international in Thailand and Australia

IV. Assam Agricultural University, Jorhat

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

The project at AU has progressed well during the year, as indicated by 62.02% of the budget utilization. Students and faculty undergone for international trainings. AAU students were able to breed Mangur fish in the laboratory using facilities created under NAHEP. Texas Tech University, USA, imparted training on Documentary Film making to students. Developed pilot courses, conducted national internships, entrepreneurship development, soft skill and skill development, and other capacity development programs are some of the key activities carried out by AU.

Exhibit: Major activities at AU

Students undergone for international trainings at UNL and IOWA University, USA	Students selling their newly bred mangur fish to farmers and faculty international in Carleton University, Canada

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 47.76% of the budget during FY 2021-22. Students got exposed to and received training from internationally renowned universities/institutes in USA, Philippines & Thailand. Communication and skill development training provided to students, industry-sponsored programmes organized, knowledge sharing sessions with students post international training exposure are some key activities carried out by AU during the period.

Exhibit: Key activities-MoUs established during the period	
Hon'ble Agriculture Minister, Govt. of Odisha & Hon'ble Vice-Chancellor during the Send-off ceremony for International training of B.Tech. (Agril. Engg.) students	Trainees & Faculties in the Skill Development training on "Food Packaging Technology."

VI. Junagadh Agricultural University, Junagadh

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

Over the last one year, IDP-JAU-Junagadh has utilized 58.41% of the total budget till March 2022. Activities like the establishment of AI, ML, Drones, Robotics and Bioinformatics lab, developed student placement portal, alumni promotion portal, learning resource development portal, developed JAU MITRA mobile application, several MOUs signed with reputed institutes, conducted national programmes benefitting design and implementation of market-oriented course curriculums, collaborations with industry players for internships and training programs have been undertaken by AU during the FY 21-22.

Exhibit: Key activities	
Modern computer laboratory	AU student has started his own start-up

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 61% of the total budget. Established skill and entrepreneurial development in Blockchain technology, IoT in agriculture, Robotics and artificial intelligence, Export and Import of agricultural commodities, developed central instrumentation facility, virtual classrooms, organized agrico green programme, developed alumni management portal, student and faculties have undergone international training, conducted several entrepreneurship programs and webinars, and the students got admissions in foreign universities are some of the key activities carried out by AU during the period.

VIII. Tamil Nadu Veterinary and Animal Science University, Chennai

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

Last year, AU utilized 55% of the total budget as planned. During this period, AU has conducted students' international training and internship, students secured admission for higher studies in the USA, students underwent industrial training, organized international and national trainings with faculties of Royal Veterinary College (RVC), London and NAARM, Hyderabad respectively on learner-centric education for faculty, organised expert lectures on social & environmental safeguards, empowerment and change are a few to mention.

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

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

Over the last year, AU has utilized 69.4% of the total budget released. Initiatives like faculty international trainings, leadership program for teachers, student international trainings, several pilot courses development, several industry-sponsored projects and positions in cutting-edge areas of agri-science, winner of All India Student Elocution Contest-2021 at XV ASC, start-up companies by students are few of the activities achieved in the FY21-22.
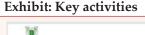
Exhibit: Key achievement

| Faculty international training | Start-up to produce liquid fertilizer from waste human hair |

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
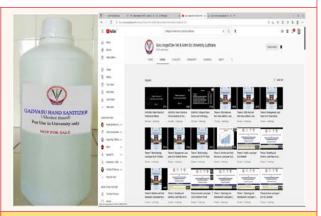
GADVASU-Ludhiana AU under IDP has utilized 73.78% of the total released budget. Last year AU developed a number of pilot courses, conducted student entrepreneurship webinars, developed industrial linkages, published orientation booklets for different colleges as guiding books for UG students, and developed a

cost-effective hand sanitiser with high potency and affordability. The internship students were trained in the formulation and development of sanitisers. The sanitiser is being used in Veterinary Clinics, Farms and Offices of the university. Several video tutorials for practical training of UG students in online mode have been designed. A YouTube channel is created containing different playlists of veterinary, dairy and fisheries modules developed under the project.

Exhibit: Key activities	
Orientation booklets and guides for different colleges as guiding books for UG students	Developed cost-effective hand sanitiser with high potency and affordability

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 64% of the total budget released. Initiated certificate courses in cutting edge technologies to enhance skill and employability of students, established innovation and incubation centre under which students are trained in hydroponics and aeroponics to raise independently a full crop of more than one lakh Rs while learning. Developed several digital UG classrooms with high-speed internet facilities across colleges and provided training to teachers, which led the university to complete online teaching and exams from classrooms to adhere academic calendar without any teaching loss. These activities have been carried out by AU during the period of FY21-22.

Exhibit: Key activities	
Guest lecture organised by AU for UG students	Incubation centre for hydroponics and aeroponics

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 64.47% of the total budget released. Established innovation cells and incubation centres on all the campuses, developed language laboratory, launched ASTRA for entrepreneurship development,

organisation of Ideathon, alumni meet, recycling paper waste generated in the university into bags, envelops and papers; these are some of the key activities carried out by partner AU.

Exhibit: Key activities	
Mr Shamanth won a consolation prize worth 10000/- for his startup idea in MANTHAN by FKCCI.	Hon'ble VC and Team Leader receiving consolation prize worth Rs. 4 lakh in the "Green and Clean Campus contest."

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 47.53% of the total budget released. Developed pilot course on digital marketing, signed MoU with industries for students capacity building, conducted capacity building programs on the blockchain, internship and placement. Established sustainable high-value IDP forest on 20 Acres at Forest College and Research Institute, Mettupalayam, conducting training on learning management system is provided to faculty members for preparing course modules, and contents are some of the key activities carried out by partner AU.

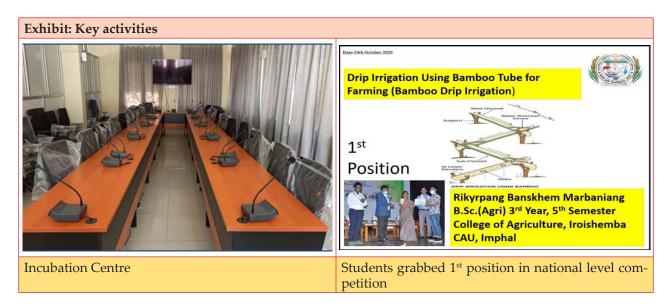| Exhibit: Key activities	
Established sustainable high-value IDP forest on 20 Acres at Forest College and Research Institute, Mettupalayam	An interactive class in progress with the help of a Smart Virtual classroom

XIV. Central Agricultural University, Imphal

Project Title: Enhancing Entrepreneurial Competence in Students to address the emerging Challenges in Agriculture and Allied Sectors
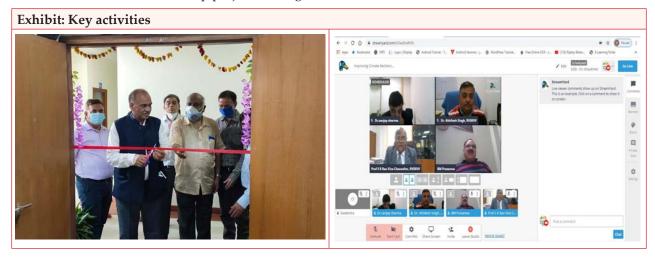
AU has utilized 60.30% of the total budget received. Establishment of incubation centres, language laboratory, installation and commissioning of Bio-Medical Incinerator. Developed low-cost battery-operated high, capacity boom sprayer, developed ergonomically designed cashew nut sheller, Durable bags and other materials from *Pueraria Montana var. lobota*, drip irrigation using bamboo tube for farming (Bamboo Drip Irrigation) and low-cost home-made egg incubator are some of the key initiatives undertaken by partner AU.

Exhibit: Key activities	
Incubation Centre	Students grabbed 1ˢᵗ position in national level competition

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 utilized 36.47% of the total budget. AU has developed smart classrooms and language laboratories. AU has also installed a waste paper recycling plant and started production. Initiatives were taken and started several start-up projects during FY 2021-22.

Exhibit: Key activities	

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

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

Partner AU has utilized 59.07% of the total budget. AU has been engaged in the installation of software Remote-Log in the university library for remote access of e-Resources to all teachers and students, entrepreneurial development course, instructional farms cum demonstration units (medicinal plants, floriculture, exotic vegetables, soilless culture/ hydroponic systems and dairy, agri incubation centres on nursery raising in forestry and Medicinal Plants. Also added facilities like smart classrooms and language lab during FY 2021-22.

Exhibit: Key activities

XVI. 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

AU has utilized 37.29% of the total budget. Partner AU has conducted mock drills for fire safety, an awareness rally for e-waste management, and developed skill development short courses for (Bee Keeping, Value Added Milk Products, Hi-Tech Nursery Management, Plant Tissue Culture and Micropropagation, and Poultry Farming) during FY 2021-22.

Exhibit: Key activities

| Mock Drill for Fire Safety | Awareness Rally for E-waste Management |

XVII. 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

Partner AU has utilized 44.48% of the total budget during FY 2021-22. AU has sent fourth-year students and faculty members for international training and running four industry-sponsored projects during the period.

Exhibit: Key activities

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 79.8% of the total budget released. This CAAST centre is carrying out the activities in Conservation Agriculture (CA) thematic area. A dedicated farm has been allocated to CA activities, development of PG course on CA, skill development program on CA for students, faculties, farmers and other stakeholders. Innovative courses on conservation agriculture were developed and taught to the third year of the Ph.D. and M.Sc./M.Tech. Expansion and improvement of the farm and laboratory facilities which promote the scope and opportunity for modern and relevant research, the teaching-learning material and smart classroom facilities have initiated and encouraged the execution of digitally interactive platforms are some of the major activities carried out by AU.

Exhibit: Key activities

Establishment of a dedicated farm as a demonstration unit on CA in the University	Installation of solar energy driven micro-irrigation system and operation of 10 HP pump using solar energy

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 78.53% of the total budget released.

- Genetic evaluation of common carp for multi-stocks in the multi inland saline environment: A base generation for developing salinity tolerant strain of common carp has been formed. Both between and within family variation have been observed for salinity tolerance which may further be used to enhance the performance of common carp in inland saline aquaculture.

- Biofloc technology for sustainable effluent management in Aquafarming: A novel media has been developed for biofloc-based rearing of tilapia in inland saline water in situ. A biofloc reactor was designed and fabricated, and the process optimization was carried out. A feed formulation using Biofloc as a dietary supplement has been developed.

Exhibit: Key activities

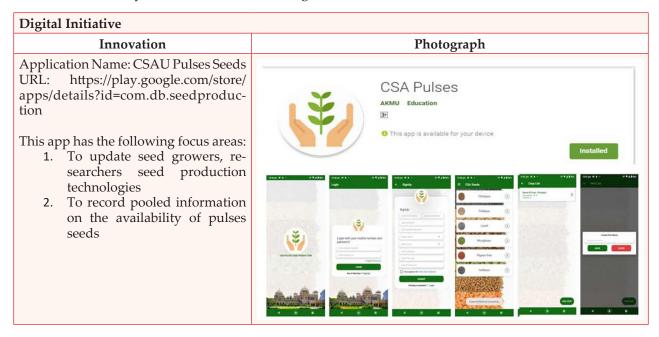| Genetic evaluation of common carp for multi-stocks in a multi inland saline environment	Biofloc technology for sustainable effluent management in Aquafarming

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

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

- AU has utilized 61.78% of the total released fund till March 2022.

- 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: CSAU Pulses Seeds URL: https://play.google.com/store/apps/details?id=com.db.seedproduction This app has the following focus areas: 1. To update seed growers, researchers seed production technologies 2. To record pooled information on the availability of pulses seeds	

IV. Indian Agricultural Research Institute, New Delhi

Project Title: Genomics Assisted Crop Improvement and Management

- IARI has utilized 83.8% of the total released fund till March 2022.

- Students and faculty have been trained abroad.

- Students carried out research in the area of genomics and made advancements in this area. The students have published 50 research papers in internationally reputed journals in the area of genomics.

- About 250 e-Resources and Webinars were prepared and made available online on NAHEP-CAAST-IARI YouTube Channel.

- *De novo* sequencing of Taroari Basmati Genome was carried out, which will serve as an important genomic resource for Basmati Rice, a major export earning commodity.

- Many useful QTLs for quality, yield traits and climate resilience were mapped, which will be useful for marker-assisted breeding.

- Drone-based high throughput phenotyping protocol was standardized, which will be useful for precision agriculture.

- Phyllospheric microbiome-based strategy was developed to mitigate blast disease in rice.

- Free-living nitrogen-fixing *Azotobacter chroococcum* (W5) whole genome Sequencing was accomplished, which will be useful to enhance the N-fixing ability of this bacterium.

Exhibit: Key activities

Discovery Centre-Drone Remote Sensing and Big Data Analytics

V. Indian Veterinary Research Institute, Izatnagar

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

- Institute has utilized 61.27% of the total released fund till March 2022.
- Students and faculties availed international training at overseas institutions/universities.
- Development of Mobile Apps, educational videos, expert system & amp; workshop/Interface meet completed.
- Four design patents were filled.
- State art of facility with Invivo imaging facility and digital PCR facility established.

Exhibit: Key activities

High-End Data Analysis System	Colour Doppler

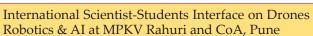### VI. Mahatma Phule Krishi Vidyapeeth, Rahuri

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

- Institute has utilized 89.54% of the total released fund till March 2022.
- Capacity Building: CAAST-CSAWM, MPKV, Rahuri students and faculties have undergone international training, developed 72 pilot courses and have around three dozen industry-sponsored projects and positions in cutting-edge areas of agriscience.
- Out-of-box initiatives undertaken by CAAST-CSAWM, MPKV, Rahuri.

1. IoT-enabled system (Auto PIS) for automatic operation of the pump and irrigation system based on the location-specific and real-time irrigation scheduling for climate-smart and precision irrigation.

2. Map-based mobile and web applications for knowing location-specific real-time ETr and irrigation water requirements for various crops by surface, sprinkler and drip irrigation systems.

3. Downscaling district level crop contingent plan (CCP) to village level CCP and corresponding apps

4. IoT enabled soil moisture sensors and soil moisture sensor-based irrigation scheduling system (PSMIS) for location-specific, real-time and automatic operation of pump and irrigation system.

5. Remotely controlled battery-operated rover for precision plant protection of orchard crops (Phule Robo) and AI-based lab model of the fruit picker.

6. Development of the concept of a climate-smart digital agriculture village and piloting in two villages.

Exhibit: Key activities

International Scientist-Students Interface on Drones Robotics & AI at MPKV Rahuri and CoA, Pune

Mobile applications developed under CAAST-CSAWM

VII. University of Agricultural Sciences, Bangalore

Project Title: Centre for next-generation technologies in adaptive agriculture

- AU has utilized 97.28% of the total released fund till March 2022.

- **Academic & HRD:** Researchers trained in the chosen areas; conducted multiple training programs and theme-specific seminars/symposia/stand-alone meetings/workshops, established a central instrumentation facility, signed MoUs with seven different Institute/organizations/ industry, nominated adjunct faculties from overseas universities, PG students and faculty trained abroad.

- **Research:** Dryland agriculture in situ moisture conservation methods developed. Six valued added products were developed from dryland crops, one commercialized; one patent filed. Improved versions of NAI-137 (for LWD resistance in maize); Tiwari for anthracnose resistance in chilli, KMP-149 (blast resistance in rice); TMV-2 for LLS resistance in groundnut developed. Over 100 unique endophytic fungi were characterized; one fungus genome was sequenced; eight promising endophytes were used for improving abiotic stress tolerance in crops (e,g: tomato, rice, and maize).

Exhibit: Key activities

Solid State Cooling model

3D printed honeycomb cells with honey and sealing

VIII. Punjab Agricultural University, Ludhiana

Project Title: School of Natural Resources Management for Sustainable Agriculture

- Till March 2022, total fund utilization is 93.07% by PAU.

- Students and faculties undergone for international training.

- Partner AU has established GIS Laboratory in the Department of Soil Science, Strengthening Precision Agriculture Lab in the Department of Farm Machinery & Power Engineering.

- AU has developed products and commercialized- Launch of PAU Urea Guide Mobile App and adoption of PAU-Leaf Color Chart, Autonomous Paddy Transplanter in Puddled Field, Smart Seeder for direct sowing of wheat in combine harvested paddy field, Rectangular Straw baler, Tractor Operated Mat type Nursery Seeder, Production of Biochar from surplus biomass.

Exhibit: Key activities	
Baling system has been mounted with combine harvester. A flat belt conveyor system was developed and selected for conveying the loose paddy residue falling from the straw walker to the feeder assembly of the baling attachment. The data analysis to check the performance of the combine harvester with the baler attachment is in progress.	A straw combine was modified for harvesting and chopping of paddy straw. Harvesting and straw bruising units were modified. The machine was evaluated for chopping paddy straw in a combine harvested paddy field. Àbout 85% of paddy straw was having chopping size of less than 12.5 cm. The machine will be evaluated in the coming season for wheat straw.

IX. Navsari Agricultural University, Navsari

Project Title: Establishment of secondary agriculture unit for skill development in students and farmers at NAU
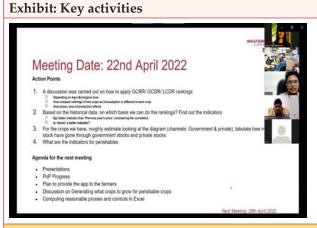
- AU has utilized 54.43% of the total released funds till March 2022.

- AU has developed five new products developed, *viz.*, Wall clocks (8 Designs), Bamboo Garden chairs (4 Designs), Bamboo waterfall (2 Designs), Bamboo Acoustic mobile Speaker, and Bamboo Sofa (2 Designs with cousin & without cousin) utilizing Wooden and bamboo wastes & as well as raw materials.

- AU has also developed other products, which is Table Decorates, Fancy Frames, Lamps, Wind chimes, Flowerpot Stand, Hanging Lamp and herbal scented agrabattis.

- Research & development of Umbadiyu packaging is under process.

Exhibit: Key activities	
Herbal scented Agrabattis	Butting Animal Science (google play store)

X. Anand Agricultural University, Anand

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

- AU has utilized 62.34% of the funds till March 2022.
- Several MoU was signed, and more than five dozen capacity-building programmes conducted.
- Total 24 price forecasts prepared and released with 75 to 85 per cent validation.
- A total of 10 commodity/sector reports were prepared.
- Started Master course on 'Agriculture Analytics'.
- Multivariate model building for price forecasting with the help of ISRO is underway.
- Collaborative Research with Western Sydney University on Enhancing Market Intelligence using real-time primary data stream is going on.

Exhibit: Key activities	
Regular weekly meetings with Western Sydney University for collaborative research work on enhancing agricultural market intelligence	Developed application 'i-kisan setu' for generating primary digital continuous data stream for enhancing market intelligence

XI. Birsa Agricultural University, Ranchi

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

- AU has completed 55.54% of the fund utilization till March 2022.
- A day-long Eastern Region Sensitization Workshop on Agricultural Export was organized by the NAHEP-CAAST on the IFS Project in collaboration with APEDA and the NSS team of Birsa Agricultural University on 06th October 2021 to promote the export of various agricultural commodities from the state of Jharkhand, to implement the Export Development Plan (EDP) adopted by the Government of India and Jharkhand, to disseminate the updated status of different agricultural commodities export

from Jharkhand and to identify the potentials of minimally processed commodities in Jharkhand.

- Twenty-one days National Refresher Course (1 to 21 February 2022) on "Recent Technologies of Livestock Based Integrated Farming System for Doubling Farmers Income" (through online mode) is being organized by the College of Veterinary Science and Animal Husbandry in association with NAHEP-CAAST-IFS Project and National Agriculture Development Cooperative Ltd. to encourage and update scientists, faculties, extension specialists, students and entrepreneurs about the recent advances in the integrated farming system.

- Nine PhD and 11 MSc students are getting the fellowship through the NAHEP-CAAST Project on Integrated Farming System, BAU, Ranchi.

- Nine certificate courses have been developed & formulated on Integrated Farming System, Fishery, Poultry, Dairy, Mushroom, Apiary, Organic farming, Bamboo cultivation, and Medicinal plants.

- A MoU on "Providing Supply and Services to the Farmers of Jharkhand" was signed with Mobile Agricultural School Services (MASS), Ranchi, for the promotion of agri-preneurship in an integrated farming system among the farming community of the state.

Exhibit: Key activities

Organic Vegetable-based Integrated Farming System Model	Duck-cum-Fish Farming System Model
Agroforestry-based Integrated Farming System Model	Horticulture Biodiversity Park

XII. Kerala Agricultural University, Kerala

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

- AU has utilized 61.53% of the funds till March 2022.

- AU has established research labs, model coconut processing units, technology demonstration centres.

- Palm sugar technology from neera commercialised and produced a revenue of Rs. 1.15 lakh.

- Development of a Performance Index for the evaluation of Coconut FPCs in Kerala and delineate the effective performance dimensions to evolve a sustainable FPC framework.

- Price forecasting for coconut which shows only a 10% difference from the actual value upon validation using CNN-LSTM Hybrid Deep Learning Model.

- Established a briquetting demonstration & training unit for coconut biomass utilization (Waste –to wealth): Green coal for the boiler industry

Exhibit: Key activities	
Briquette making Plant	CAAST Centre: Coconut Wood Technology Demonstration Centre (CWTDC)
Coconut Value addition Facilitating Centre	Fabrication Automated Coconut Tree Climber
Coconut Processing Lab – RARS: Coconut Chips	Lip balm using VCO & natural colours from carrot, beetroot, hibiscus and coco powder

XIII. Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya, Palampur

Project Title: Protected Agriculture and Natural Farming

- AU has utilized 78.20% of the funds till March 2022.
- Develop two pilot courses under the project.
- Number of industry-sponsored projects: 9 (No.).
- Enhanced positions in cutting-edge areas of agri-science: (Shitake Mushroom & Animal Cancer Diagnostic Lab.
- Started hydroponics startup.
- Post Graduate Students established a nutritional garden.
- Licensing of seed multiplication of released varieties/hybrids with five Private Companies for five crops.

Exhibit: Key activities

| Best Performing Varieties under Natural farming | Rainwater harvesting & utilization through drip irrigation with solar panel system |

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 61.04% of the funds till March 2022.

- Field Experimentation for Biotic Stress Calculations in Soybean & Cotton field of Metrology Department with the help of Jackal J100 Robot & Real Sense, Multispectral Camera to obtain RGB, NIR Images, Calculated vegetation indices of the plants.

- Partner AU has signed MoU with Washington State University, Pullman, USA, Belarusian State University of Informatics and Radio electronics, six National Universities and 13 Industries.

- Rain water harvesting structure completed at NAHEP-DFSRDA, VNMKV, Parbhani centre with environmental aspect to collect water of rain which help to increase the water level.

- Developed five Laboratories, CAD/CAM, Agri-Bot, Agri AGV Workshop, Agri Drone lab, Hydraulic and completed installation and trainings.

Exhibit: Key activities

| An automated Grafting Robot implements clipping, moving, positioning, cutting, binding and wrapping rootstock and scion saplings | Jackal and Husky robots are procured from Canada for performing different agricultural field operations like fruit harvesting, spraying, field scouting etc. |

XV. Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur

Project Title: Skill Development to Use Spatial Data for Natural Resources Management in Agriculture

- AU has utilized 34.57% of the funds till March 2022.

- Established spatial data analysis laboratory equipped with Workstations, Image processing software, High internet speed facilities etc.

- Established hi-tech training hall with a capacity of 35 person.

- Development of spatial data products such as LULC map, Crop classification map, Groundwater Potential Zoning map, Surface Waterbody map, Potential Evapotranspiration map, LULC change detection map.

- Students undergoing master's and doctoral degree programs are involved to undertake research projects on related aspects such as river revival, watershed prioritization, carbon sequestration, characterization of insect infestation in crops, characterization of heat stress and plant growth regulators in crops using Geoinformatics.

Exhibit: Key activities

| Spatial data analysis lab | Capacity building centre |

XVI. Maharashtra Animal & Fishery Sciences University, Nagpur

Project Title: Centre of Excellence for Advanced Research on Animal Food Safety

- AU has utilized 68.92% of the funds till March 2022.
- *Established clean room with biosafety cabinet class III & anaerobic work station, chemical residue testing lab, nutrition lab, molecular lab and v*<u>irtual classroom.</u>
- Students and faculties have undergone for national level training.
- Partner AU has about a dozen of industry-sponsored projects.
- Started Indian Network for Fisheries and Animal Antimicrobial Resistance (ICAR-FAO Initiatives).

Exhibit: Key activities

| Real-time PCR Molecular Lab | Chemical Residue Testing Lab |

| Virtual Classroom | 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, Partner AU bagged the first International Project funding from Australia India Council & Melbourne University due to our international interactions. Established a Network Centre/ Data Centre in the College / BASU to carry out all the computerized activities in Colleges/ BASU and upgraded the placement cell and language lab in all three colleges of the University, installed RFID at livestock farm for better management.

Exhibit: Key activities	
Cow Dung Log making machine has been installed at a livestock farm to convert cow dung into log, an environment-friendly fuel	Classrooms were renovated and equipped with a Smart board with all other ancillaries for online teaching

II. Dr Panjabrao Deshmukh Krishi Vidyapeeth, Akola:

Project Title: Capacity building and skill development in renewable energy

- University was granted Accreditation by ICAR with an A grade.
- Created state-of-art modern infrastructure facilities to enhance the teaching-learning and skill development process and Modernized three laboratories.
- Under the green initiative, 195 kW solar power plant generates green energy, which saves INR 16-17 Lakh (Approximate) per annum. It is estimated that this power plant will generate 2,76,900 units per annum. Also, the installation of a 400 kW solar power plant is in progress, which will save INR 45 Lakh per annum.

Exhibit: Key activities	
Biomass-based air heating system for the thermal application	Water supply arrangement helped in improving the green cover in the AU campus

III. Maharana Pratap Horticultural University, Karnal

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

- Under Human Capacity Building Webinars, Seminars, National Level Training, Short Visits & Workshops were conducted for Young Entrepreneurs, Farmers, Students, Faculties etc. on different

topics of Horticulture (Mushroom Cultivation, Protected Horticulture & Market Linkage) and International Level Training could not organized due to Covid-19 pandemic.

- Smart Conference/Classroom was established at COH, Nilokheri and RMRC, Murthal, with the facilities of E-Podium, Interactive Teaching device, LED Projector, Video Conferencing Facilities, Furniture and fixtures and Air conditioning facilities etc.
- Strengthening the digital library with computers and peripherals, e-books, journals etc.
- Renovation of Lecture rooms and conference rooms at COH, Nilokheri and RMRC, Murthal.
- Bio-control Lab, Seed Processing Unit and Plant Tissue Culture Lab at Anjanthali Farm (Karnal) are being developed without NAHEP.
- Span and Compost Production Unit established at RMRC, Murthal.

Exhibit: Key activities

Interactive Teaching Device & Video Conference Solution established at College of Horticulture, MHU Karnal Camp at EEI, Nilokheri	Video Conference Solution Hall at MHU Regional Mushroom Research Centre, Murthal (Sonepat)

IV. PV Narsimha Rao Telangana Veterinary University, Hyderabad

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

- NAHEP helped to improve facilities at the Veterinary Clinical Complex of this University, thereby improving the quality of Services offered to the farming community and Capacity building of students.
- Induction of diagnostic facilities greatly enhanced the quality of diagnostic and clinical services offered to pet and farm animal owners.
- Greatly improved the quality of training being imparted to Graduate and Post-graduate students. These improvements will go a long way in improving animal and human health in the state.
- Improvements in the feed analytical laboratory made with the support of NAHEP enabled the utilization of unconventional feed resources specific to the local area and precise analysis of available feeds, which enabled the farmers to optimise feed costs and quality inputs.

V. Swami Keshwanand Rajasthan Agricultural University, Bikaner

Project Title: Proposal for Innovation Grant under NAHEP

- Organized National/International webinars, Brainstorming sessions of eminent academicians conducted, Placement training for MBA (Agri-Business) students, and Trainings regarding entrepreneurship development in agriculture and allied sectors.
- Strengthened libraries of newly established colleges of the University with required books.
- Facilitated laboratory chemicals and other petty items required for student research.
- Facilitated faculty for participation in Faculty Development Program at IIM, Indore.
- Seven days programme on Yoga and Naturopathy for Strengthening Immune System under the Scenario on COVID-19.

- One-day training camp on Yoga and naturopathy for strengthening the immune system of teachers and students at Government Secondary School, Kavani, Bikaner.

- Nutritional Gardening Campaign & Plantation Program - Curtain Raiser Program of International Year of Millets 2023.

Exhibit: Key activities	
National/ International Webinars and E-Workshop through a virtual platform	Virtual Kisan Mela, Virtual dialogue with farmers, Virtual seed day, etc. for the farming community

VI. Kamdhenu University, Gandhinagar

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

- Strengthening of placement cell resulted in an increased rate of placement and awareness regarding carrier planning, goal setting and communication skill development for facing the interview has been increased.

- Alumni cell, Entrepreneurship cell and Experiential Learning Unit have also been developed.

- College of Dairy Science, Kamdhenu University, Amreli has developed a "Nanotechnology-based dipstick for the instant detection of milk adulterants". IPR has also been filed for this innovative technology. Technology transfer process has been initiated for this technology.

- In Human Capacity Building Programme, various training programmes/workshops/seminars have been carried out for faculties and students.

- Partner AU has signed MoU with Kold College, Denmark, for mutual benefits of learning new skills and knowledge generation in the area of dairy education and research.

Exhibit: Key activities	
Soft skill development and entrepreneurship development training program	A total of 20 online planned training programs/ workshop/ seminar has been carried out

VII. *Agricultural University, Kota*

Project Title: Innovation plan for hi-tech Horticulture

- More than 450 students and faculty members benefitted through training, workshop and seminars organised under NAHEP. Nine faculties benefitted through exposure visits in the country.

- Around 90 students completed their experiential learning on protected cultivation of high-value crops.

- More than 20% of students were placed in different agri-horticultural industries this year. Teaching efficiency has increased through the modernization of classroom.

- One certificate course on "Protected cultivation of vegetables and flowers" started for three months duration utilizing the created infrastructural resources under NAHEP.

- Area under cultivation has increased by 10% due to the modernization of farms- installation of drip, fertigation systems and farm implements.

- Strengthening of infrastructural faculties of protected cultivation and demonstration has attracted the rural youth and has also increased the area under cultivation of protected cultivation (10ha) in the district, income and livelihood of local entrepreneurs.

VIII. *Rani Lakshmi Bai Central Agricultural University, Jhansi*

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

- Secured accreditation for the University and its two colleges, viz., College of Agriculture and College of Horticulture and Forestry.

- Faculties have undergone international training.

- Pilot course developed on Organic Production Technology.

- Secured five industry and seven RKVY-supported projects (worth INR 15 crore).

- E-library having 40 All-in-One desktops has been developed. Out of 22 smart classrooms, 4 have CCTV for effective monitoring. All corridors of the Academic building have CCTV cameras for security & safety.

- Digital initiatives: (Organizing online trainings, conducting online examinations, administering attendance, developing web applications, e-learning modules etc.

IX. *University for Agricultural Sciences, Raichur*

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

- Students and faculty are effectively accessing the e-resources created like e-books, Kindle Smart Library, English Language Lab, Grammarly, SPSS statistical software etc. through MyLoft (My Library on Finger Tips) Remote access facility. Usage of library resources increased by more than 30% after the creation of the facility.

- Faculty research publications increased to the extent of 35% after capacity-building activities through NAARM & introduction of Turnitin plagiarism software and Grammarly by publishing more research papers in high NAAS rated (>6) and impact factor journals.

- NAHEP-IG project intervention aided in improving ICAR SAU ranking from 60 in 2018 to 21st ranking in 2019 & 25th in 2020 due to utilization of the e-resources facility created under the project.

- Established a strong linkage between the alumni and present students of the University through the Alumni networking programme under the project. More than 5% of outgoing students engaged in Self Entrepreneurship & Startups.

- The University has entered into the process of NAAC accreditation in 2021-2022.

- Created awareness on the Agricultural education system among Local schools/College principals, Science teachers and students. As a result, there was an increase in student enrolments to the extent of 10% for the UG degree programme.
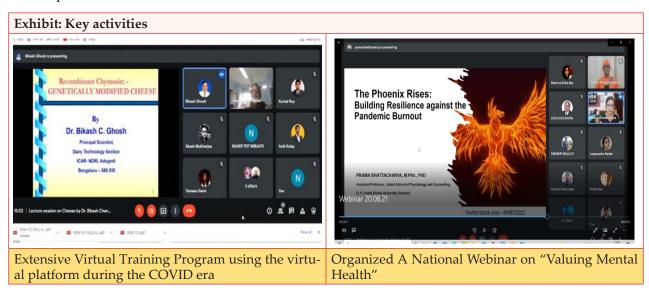
- University Agri-war room was started during lockdown to provide solutions to farmers' problems in production & marketing activities. Farmers and consumers network was established under the project.

- Collaboration with IIIT, Dharwad is established in developing web & mobile app-based innovative tool "Scholar Chat "for scientific communication among researchers.

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

- Establishment of a VTCC- Dairy Microbes component sub-centre under NCVTC, Hisar at Department of Dairy Microbiology, Faculty of Dairy Technology, Mohanpur Campus, WBUAFS.

- Seventeen faculty members and 28 PG students have undergone national training.

- Conducted seminar (6 no.), workshop (1 no), training (10 nos.), lecture sessions (26 nos.) by eminent scientists, professors from national and international organizations and Alumni under capacity building programme.

- A total of 172 trainees underwent an entrepreneurial Training programme in the area of 'Dairy Processing' under outreach activities, 20 trainees have already enhanced their business, and 07 trainees have started their business.

- Activities undertaken for Clean and green Campus at F/O Dairy Technology, WBUAFS.

- Maintenance and upgradation of garden and lawn in the campus.

- Cleaning of garbage surrounding the campus.

- Segregation and dumping of garbage from laboratory and Dairy Plant and e-waste in a separate place.

Exhibit: Key activities	
Extensive Virtual Training Program using the virtual platform during the COVID era	Organized A National Webinar on "Valuing Mental Health"

XI. Sri Konda Laxman Telangana State Horticultural University, Hyderabad

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

- Placement cell is strengthened with infrastructure facilities, and a database of the unemployed graduate students has been created. During 2021-22, 150 undergraduate students were trained in "soft skills and entrepreneurship development", and 150 undergraduate students were trained in the "Personality development programme" Major private organizations conducted interviews & 20 students have got placements in firms like OILFED and NOVA agri tech etc.

- PG Laboratories is strengthened with sophisticated equipment in all laboratories, purchase of double beam spectrophotometer, deep freezer, kjeldhal unit, stereo zoom microscope with Project support.

- Renovation of Post-harvest lab helped in facilitate conducting trainings for rural women on value addition of fruits and vegetables.

- Students were trained in competitive exams, and seventeen students got JRF ranks and secured seats in reputed universities in different states.

- Three students have started their own firms with the support of the faculty of the college in landscape gardening, vertical gardening, CAD designing and Sericulture.

- Dr Shanker Swamy, Assistant professor (Horticulture), designed a trade mark of UNIVERSITY & also got an appreciation award on University Foundation day for his contribution towards trainings students and rural youth in food processing.

Exhibit: Key activities	
A number of trainings were organized for students in virtual mode on Soft skills development for career opportunities using the facilities like interactive board purchased under NAHEP, and faculty attended MOOC classes organized by NAARM during the Pandemic	During the COVID pandemic, all classes were conducted in ONLINE mode on a common platform such as zoom, Google meet, WEBEX etc. All examinations, Synopsis presentations, and colloquiums were conducted in the online mode

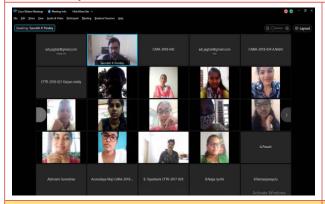### XII. Professor Jayashankar Telangana State Agricultural University, Hyderabad

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

- Established DRM for Krishi Kosh Institutional Repository at PJTSAU and IARI for effective preservation and dissemination of digital knowledge resources of NARES, which resulted in increased access to scholarly resources 24 X 7 without any interruption and data security. The average daily hits on this digital repository are 13,838 from all over the world, and 2.2 Cr hits since inception.

- Faculties were undergone for International Training on Digital Humanities Summer Institute at Univ. of Victoria, CANADA.

- Around 12,800 Students, Research Scholars, Faculty and Library Professionals from various SAUs and ICAR Institutes got benefitted through Sensitization Workshops and Capacity Building Programmes.

- 392 Library Professionals working in NARS were trained through Capacity Building Workshops, Training Programmes, Workshops etc.

- Developed mobile app for KMC-PJTSAU (Bibliographical details search platform).

- Green Campus Initiative: different saplings were planted at the PJTSAU, University Main Campus.

- Organized Career Orientation Training for Students and Training of Trainers Program for Faculty of PJTSAU, Hyderabad.

Exhibit: Key activities

Career Orientation Programme for Students was conducted	Planted saplings of Tecoma (Golden trumpet flower tree), Silver Oak, Tabeubnia (Rosy trumpet flower tree), Plumaria (Temple tree)

XIII. Sri Venkateshwara Veterinary University, Tirupati

Project Title: Innovation Grant proposal

- Established Digital Studio at CCVEC at SVVU, Tirupati.
- Faculty members were deputed for Abroad Training under NAHEP (IG).
- Around 250 faculties were deputed for National Level Trainings in India.
- Around 100 students were deputed for trainings under short visits.

Exhibit: Key activities

Procured Graphic Computer System, Edit Suit Computer and Voice Over Dubbing Suit and Software for Video Editing	Online Virtual Classes were conducted for UG and PG Students during the Covid-19 pandemic

XIV. Agriculture University, Jodhpur

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

- Developed a Language Laboratory for strengthening the communication skills of students.
- Procured 4238 books, 25 e-books and 08 journals/periodicals subscriptions. Procured a Book Management System with Bar-coding.
- International exposure to the faculties in the International Organizations viz. ICARDA, MOROCCO and CSU, USA.
- Animal Shed for providing practical training to the students. Fumigation chamber, vermicompost unit and storage facilities.

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

- University got Accredited by ICAR, New Delhi.

- About 54 students participated in National Conference, workshop/seminar and 07 students were awarded the best presentation/young scientist award.

- About 48 members of faculty participated in National Conference and workshop/seminar, and 04 faculty members were awarded the best presentation/best scientist award.

- Partner AU 03 Ph.D. students were sponsored for offline training of 3 months in ICAR institute for research purposes.

- AU 74 students received training on soft skills and language development.

Exhibit: Key activities	
Soft skill and language development training	Training on Equine health management with emphasis on Animal Handling and Welfare

XVI. Uttar Banga Krishi Vishwavidyalaya, West Bengal

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

- Establishment of virtual classrooms. Commissioning classroom is completed, Increased knowledge transfer process beyond time and geographical barrier.

- Developed fully furnished computer lab equipped with student utility software on statistical tools, Graph pad, AutoCAD etc.

- More than 1500 beneficiaries (Including Females, SC, and ST) participated across the globe in the various Webinar, seminars, and national and international training conducted by the AU under the NAHEP.

- Three risk mitigation measures were adopted for Civil works, as per EA and EMF of NAHEP.

- Kalpabriksha Nursery is a startup dedicated towards providing high-quality planting materials, seedlings etc., at a very affordable rate to our farmer community. He further established a firm, Sweet Greens Agro-Industry, which is working on hydroponic technology dedicated towards growing fresh organic fruits and vegetables and a robust supply chain connecting farmer clusters.

- The NAHEP team helped the university in continuing academic instruction in virtual mode by providing a solution requiring low bandwidth and data consumption to reach the most disadvantageous students.

- Successfully completed online admission and counselling for the students during 2021-22.

Exhibit: Key activities

Kalpabriksha Nursery is a startup dedicated towards providing high-quality planting materials, seedlings etc. at a very affordable rate to our farmer community

University is continuing academic instruction in virtual mode using a solution requiring low bandwidth and data consumption to reach the most disadvantageous students

XVII. Dr Rajendra Prasad Central Agricultural University, Pusa

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

- Started 19 new academic programmes (UG-2, PG-2, PhD-4, PG Diploma-3 & Certificate Courses-8).

- Student strength increased from about 1100 (in 2019) to about 2100 (in 2022).

- Strengthened the IT Infrastructure of the University.

- Timely completion of the academic programs (even during the pandemic).

- University achieved the ranks within TOP TEN during the last two years in the survey conducted by a leading national media group (India Today).

- Received Excellent Green Campus Initiative Award (2021-22) from the Agriculture Today.

- Received University of the Year Award-2021-22 (more than 30 years in existence) from FICCI.

- Provided access to e-resources to the students for study during lockdowns/pandemic.

- Provided online access to study material/lecture notes to the students.

- Establishments of LAN in the newly constructed Academic and residential buildings.

- Digitization of about 800 Masters' and doctoral theses and providing digital access to students on Intranet.

- Online admission and registration of students while university hostels were vacated.

- Development of a model for monetization of household waste and cow dung (Sukhet Model).

Exhibit: Key activities

Demonstration of the Academic Module and re-view of the progress of the NAHEP project by the Vice-Chancellor

Modules of Integrated University Management System developed

XVIII. Indira Gandhi Krishi Vishwavidyalaya, Chhattisgarh

Project Title: Creation of Facilities and Modernization of the Colleges

- Establishment of e-classrooms in all five colleges is helping a lot in the effective teaching and learning process.
- Purchase of e-books under the project helped the students to learn better from their hometown without being physically present in the classroom.
- Laboratory equipment and office furniture better facilitated/supported understanding of the subjects both in practical and theory.
- ICT facility developed under the project has started giving better results for competitive exams also.
- Social safeguards, environmental safety, and waste disposal were some of the initiatives realized to be addressed and undertaken by other colleges of the university as well.

Exhibit: Key activities	
Skill Development of Students for Production of Bio-control Agent *'Trichoderma'*	Skill Development of Students for Mushroom Spawn and Mushroom crop production

XIX. VCSG Uttarakhand University of Horticulture & Forestry, Bharsar, Uttarakhand

Project Title: Strengthening of VCSG Uttarakhand University of Horticulture and Forestry

- Strengthened and upgraded Laboratories at COH & COF for practical knowledge of graduates and Post Graduates students.
- Improved R&D facilities at the university level through the establishment of NAHEP-Central Instrumental Laboratory (CIL) successfully.
- Upgraded classroom facilities with the establishment of 06 smart classrooms and improved online teaching through ICT tools and video conferencing.
- Strengthened Libraries at COH & COF with 841 accessions of text and reference books, and the barcoding process at CoH is underway.
- Renovated ten poly-houses for farm activities/students' research and experiential learning—this improved round-the-year farm activities in the cold climate of the Bharsar campus.
- Under the capacity-building programme, short visits of PG students to various farms, processing units and R&D institutions were organized, and faculty members participated in various seminars, workshops and webinars.
- To ensure collaboration for academic and R&D activities, MoU with 03 Universities/Institutions/Organizations signed by the University and MoU with IISWC-ICAR, Dehradun is submitted to the academic council for the approval.
- The Incubation centre "Himalayan Agri Technology Innovation Entrepreneurship Park" is successfully registered in collaboration with EkGaon Consultancy Services, New Delhi.
- Developed Kedar Ranichauri Ray-1 (KRR1) variety of Rai and tri-hybrid variety of Apple.
- Filed application for Indian Patent for "Hydrocolloid coated apple chips and process of preparation (Application No. 202113000457), 2021-22.

- Published a Pictorial Guide of floriculture crops for the higher Himalayan region to create awareness regarding potential crops under the capacity building and ESP activities.

XX. Sardar Patel University of Agriculture & Technology, Meerut

Project Title: Institutional capacity building leading to accreditation of colleges

Developed Advance Biotechnology Laboratory (CoB) & renovated lab being utilized by the College, established small lab animal facility for UG and PG students for teaching and research developed and approved by CPCSEA. Four faculty members received capacity-building training on entrepreneurship development organized by EDII, Ahmedabad.

Exhibit: Key activities	
Developed advanced biotechnology lab	A small animal laboratory has been developed and approved by CPCSEA, New Delhi

XXI. Kerala Veterinary and Animal Sciences University, Wayanad

Project Title: CASM (under KVASU) - Proposal for ICAR Innovation Grant under NAHEP

- Fifteen students attended a training programme at the National Research Centre on Meat, Hyderabad.
- Ten faculty members attended 'Leadership Programme for Women Scientists of NARES organised by NAARM, Hyderabad, during 2021-22.
- Two faculty members attended 21 days National Refresher course during 2021-22.
- Improved infrastructure facilities - Established model gym and Smart Classroom.
- Organized 2-day Skill Development Workshop for improving communication skills.
- 'Solace- nurturing minds'- Interactive and Counselling Session for Students- in order to enhance the mental health of students.
- Two-day residential induction camp for improving the soft skills of the students.

Exhibit: Key activities	
Conducted three days of counselling sessions for the students to correct the mental stress and difficulties suffered by the students due to the Covid-19 pandemic	Demonstration hall was established with 60 seats with writing pads and an interactive smart white-board for the conduct of talks and practical sessions for the students and internees

XXII. Chhattisgarh Kamdhenu Vishwavidyalaya, Kawardha

Project Title: Upgradation of Academic and Research Facilities of College of Fisheries

- Renovation and partitioning of College library. Procured necessary books for students.
- Microbiology laboratory was renovated under the project to upgrade the research facility for students and staff.
- Fish Museum was developed under the project for easy accessibility of various fish species to students during practical classes.
- Laboratories of various departments were strengthened through procuring instruments, glassware and chemicals for student practical and research.
- Hostel facilities (Boy's & Girls) were strengthened through procuring of beds, tables, chairs, almirah and water cooler.
- Two days workshop on "Improving visibility and research productivity in Institutes of Higher Education" on 6-7th January for the benefit of Undergraduate students and Faculty under funding support of ICAR-NAHEP.
- Exposure visits of students and staff were organized for the student and faculty development programme.
- 100 Self-Help Group women from the adopted village "Majgoan, Seavaikachar, Khairbana Kala etc. were trained on "Fish production and value addition in fisheries.

Exhibit: Key activities

Fish Farmers of Bodtara village were trained on Fish Feed Management in Village ponds	Fully Digital seminar room developed for organizing virtual workshops

XXIII. Nanaji Deshmukh Veterinary Science University, Jabalpur

Project Title: Innovation Grant under National Agricultural Higher Education Project for Strengthening of College of Fishery Science, Nanaji Deshmukh Veterinary Science University, Jabalpur (IG)

- One central laboratory has established.
- One smart classroom has established.
- Three skill development program has been organized.
- One Webinar has been organized for students.
- Renovated farm structure.
- Two practical training has been organized.
- Establishment of demonstration unit (Bio Floc and RAS) under process.
- Establishment of e-learning resources and digital library.
- Value-added food products are raw or pre-processed goods whose value is enhanced by adding ingredients or processes that make them more attractive to the buyer and/or more easily usable by

the consumer. Students of the College of Fishery Science have been developed that transform value-added fish products through the Technical Initiative Program.

- Fabrication of aquarium tanks is an art which we can learn within two to three days of practical experience. Students of the College of Fishery Science have been developed different size aquarium fabrication and maintenance through the Technical Initiative Program.

Exhibit: Key activities	
Conference Hall for Conducting online meetings, trainings, seminars and webinars	Eight Well equipped labs are available in different departments, and a Central instrumentation facility (CIF)

XXIV. Rajasthan University of Veterinary & Animal Sciences, Bikaner

Project Title: Establishment and strengthening of livestock innovation, knowledge, entrepreneurship, skill centre for accreditation

- LIKES, PGIVER, Jaipur and CVAS, Navania, have organized five physical workshops and three exposure visits for postgraduate and undergraduate students.

- LIKES P, GIVER, Jaipur and CVAS, Navania organized 12 National Webinars. In these Webinars, 4522 students, 2806 faculties, and 3400 entrepreneurs participated from all over India.

- 74 Internship students (2021-22) got internship training in the LIKES centre of PGIVER, Jaipur and CVAS, Navania, for ten days.

- B.V.Sc & A.H. students received internship training at the LIKES Center of PGIVER, Jaipur and CVAS, Navania, for ten days. Under this training, students improved their awareness about avenues in the livestock sector for self-employment and entrepreneurship.

- Five days Workshop has been organized by LIKES Center CVAS Navania on "Skill Development in Laboratory Diagnosis of Livestock diseases through Advance Tools and Techniques" for undergraduate students.

Exhibit: Key activities	
Establishment of LIKES Centre at CVAS Navania for online trainings	Concept of Startup to promote and nurture incubation ecosystem among students

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

Component 1a: Institutional Development Plan (IDP)

Documentation of success stories is 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 the implementation process that led to better or satisfactory results.
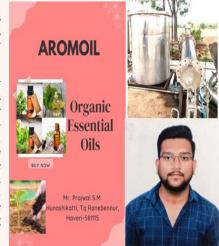
Name of the institute: University of Horticulture Sciences, Bagalkot, Karnataka

Success story

Organic essential oil extraction unit "AROMOIL" for improved health outcomes: Setting the entrepreneurial mindset through NAHEP

Mr Prajwal S.M., a student of the College of Horticulture, Bagalkot, has started his own business in the name of "AROMOIL." The AROMOIL is an organic essential oil extraction unit. He will register this as a new entity.

He participated in a one-day sensitization programme conducted by MANAGE on Introduction to Agri Start-up Ecosystem: Opportunities and Challenges aimed at making students aware of opportunities for Entrepreneurship in the Agri Start-up Ecosystem and how various ecosystem enablers are helping the startups to progress at various levels. At the end of this programme, all students were asked to fill out the idea of a business plan. Based on the business idea, 120 students were selected for further programmes. For these 120 students, two residential EDP training programmes were conducted by Native Circle, Bangalore, for four days and by MANAGE, Hyderabad, for five days. It helped the students convert their business idea into a presentation format covering problem statements and solutions.

He was one of the 52 students who presented their business plans after two residential EDP training programmes. His business idea was one of the five business plans awarded with "Best Business Plan."

Name of the institute: Acharya N.G. Ranga Agricultural University, Hyderabad, Telangana

Success story

Providing farming solutions to farmers to improve their income

Ms. Keerthi Sri Lakshmi Tanneeru B.Sc. Agriculture graduate. She has attended a training programme on the Agro-based Entrepreneurship Development Programme conducted by Entrepreneurship Development Institute Of India (EDII), Ahmedabad, from 8th April – 3rd May 2019, as a part of ANGRAU IDP-SKILL DEVELOPMENT PROGRAMME for undergraduate students. During the 25 days of the training programme, she learned various things related to agro-based entrepreneurship, got motivated, and tried to fulfil all the requirements to become an agri-entrepreneur.

She has learned many new concepts like What is Entrepreneurship, Business opportunity identification, Soft skills for interpersonal communication, Critical thinking, Understanding self & others, Venture idea and Idea canvas, Power of negotiation, Effective communication, Social entrepreneurship, Art & Strategy for business communication, Market research for entrepreneurs and small business and Business Model Canvas. She has also visited Sardar Patel Organic farm, where Organic Farming has been practised on 125 acres. She learned many techniques to get better yields by following organic farming methods.

She learned how to nourish our ideas, incubate them and develop business models during her visit to the incubation centre. The training programmes helped her and her co-founding members develop the idea and start a new business model, "Future AgriNest Farming Solutions Pvt Ltd." company in March 2021.

Name of the institute: Maharana Pratap University of Agriculture & Technology, Udaipur, Rajasthan

Success story

Providing gardening solutions through "SHIYATA-The Garden Gurus": Setting the entrepreneurial mindset through NAHEP

Ms. Himanshi Jhalor and Ms. Divya Choudhary, final year B.Sc. Agriculture students have started "SHIYATA-The Garden Gurus" to provide garden planning, garden and landscape establishment, garden maintenance & care, and other gardening solutions.

They got motivated for this startup after looking at the pandemic scenario where people need to engage in greenery and nature for good health and lifestyle and started the startup in 2020. In the first 14 months, they completed about six projects for different individual clients. They plan to provide all the solutions related to gardening under one roof in the future. 1) Home décor, balcony décor with plants, rooftop gardening, and kitchen gardening; 2) Initiate a practice of gifting away plants on various occasions (birthdays, anniversaries) & festivals; 3) Provide complete garden & gardening solutions scientifically; 4) Promote green by growing green; 5) Encourage the concept of vertical gardening.

Name of the institute: Sri Konda Laxman Telangana State Horticulture University, Hyderabad, Telangana

Success story

Providing gardening, landscaping, and miniature gifting services in Hyderabad city through "Serene Plantae": Setting the entrepreneurial mindset through NAHEP

Ms. Jhansi Kunta graduated from the College of Horticulture, Mojerla-SKLTSHU, in 2019-20. She has started a firm, "Serene Plantae," to provide gardening, landscaping, and miniature gifting services in the Metropolitan city of Hyderabad.

She has received training in Entrepreneurship and personality development under the NAHEP project, which helped her become a confident and successful entrepreneur in the landscape industry sector, where only a few women are involved in the business. She has also employed several qualified technical staff in her gardening projects. She has also completed many landscape projects successfully and is known for providing quality customer service.

Name of the institute: Junagadh Agricultural University, Junagadh, Gujarat

Success story

Producing and marketing organic ajwain honey through "Madhav Organic Honey": Setting the entrepreneurial mindset through NAHEP

Mr Solanki Brijesh and Mr Domadiya Harshil, two B.Sc. final year students, have started their startup "Madhav Organic Honey". They understood the concept of organic honey and thought of starting the production of organic honey from ajwain crops cultivated in their neighbourhoods. They also convinced a bunch of relatives and started rearing honey bees.

So far, the enterprising students have managed to keep ten bee boxes in their fields and 50 bee boxes in their neighbourhoods. About 500-700 grams of honey can be obtained from one box, and altogether minimum of 3 kg of honey can be harvested from one box in a year. The three-month-long certificate course on: 'Export-Import of Agriculture Commodities' by the Lime Institute of Export-Import Training, Rajkot (Gujarat), has helped improve students' thoughts of becoming budding entrepreneurs.

Brijesh and Harshil were also the beneficiaries of this certificate course, through which they will soon apply for the Import-Export Code (IEC). The student development programmes on 'Soft skills' have helped them communicate their ideas and demands to future collaborators. The NAHEP-IDP programmes have given both Brijesh and Harshil the confidence to travel to Nasik to understand the needs of the organic market. Training programmes like 'Processing and Value Addition of High-Value Crops' have helped them tune their strengths to understand the market's pulse and motivated them to start their startup for producing organic ajwain honey. Now they are expanding their base by marketing honey and honey products based on litchi, cumin, and jamun. Initially, their main focus was to learn about this business. In the next five years, the student-entrepreneurs have their target fixed to make an annual profit of Rs. 25 lakh and employ at least 15 people.

Helping organic farmers by providing organic farm inputs through "Nav Sarvada Organics Pvt. Ltd.": Setting the entrepreneurial mindset through NAHEP

Mr Parth Vora, a final year student of the College of Agriculture, JAU, has started a startup company "Nav Sarvada Organics Pvt. Ltd." This startup is still in the nascent stage.

His company is involved with organic farm inputs. The company has acquired Ethics Agro Tech (Infinity) Pvt. Ltd. He expanded his network nationally, viz., Tea Plantation in Assam, and he is also conducting trials on grape cultivation in Nashik, Maharashtra. The company's organic products are certified by Tocklai Tea Research Institute, Tea Research Associate, Jorhat (Assam). The company has retail and wholesale outlets in Gondal and Jasdan Talukas of Gujarat.

This startup business at the moment has provided direct and indirect employment to 15 to 20 people. In addition, many farmers have been motivated to do organic farming.

Name of the institute: Sher-e-Kashmir State Agriculture University, Kashmir, J&K

Success story

Converting poultry waste of hair and feathers into organic fertilizers through his LLP: Setting the entrepreneurial mindset through NAHEP

Ahmer Bashir, an agriculture engineering student of SKUAST-K, has established an LLP to turn his innovative idea of making organic fertilizers from human hair and chicken feathers that would otherwise go to landfills into a commercial success.

Despite making up a huge proportion of municipal waste, there is no waste management plan for keratinous waste that takes more than 50 years to decompose Ahmer's innovation uses a novel method to convert the hair and feathers found in poultry waste into agricultural fertilizers just in 50 minutes. A liquid developed thus is rich in several minerals and micronutrients while being cost-effective and completely natural and can therefore be safely used in the Indian Agricultural Systems.

This innovation uses waste products available abundantly and readily provided by the civic bodies as organic fertilizer ingredients. Ahmer also plans to find more use for the keratinous waste, including utilizing it as feed and making the product available to farmers all over the country.
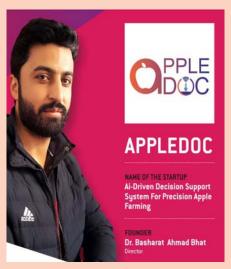
Besides receiving a BIRAC BIG grant of Rs 50 lakh from GoI, Ahmer has received many grants and awards, including incubation and grant support under RKVY RAFTAR Scheme. Winner of SOLVED CHALLENGE 2021, UNDP/UNV (UNO) with Union Ministry of Sports and Youth Welfare, GOI. Winner of I2EDC "Million Dollar Ideas" Pitch deck challenge 2022, IIT Jammu, etc.

AI and ML-driven one in all solution App for Apple farmers, input suppliers and markets: Setting the entrepreneurial mindset through NAHEP

Basharat Ahmed Bhat of SKUAST-K aims to revolutionize apple cultivation by providing a smart app to farmers that will change the way apple cultivation is done in Kashmir. AppleDoc is the first startup supported by SKUAST-K and is being incubated at the SKUAST-K incubation centre. Basharat received a BIRAC BIG Grant of Rs 50 lakh, and the Apple Doc is recognized as a startup with StartUpIndia.

Apple is a principal export product that Kashmir farmers produce. The absence of the right data and on-spot farming updates has inflicted losses on our farmers. To find a solution and give farmers a mobile application for the same, Basharat came up with an AI-driven Decision Support system in the form of a mobile application called "Apple Doc". However, this growth is beset with the challenges of poor information dissemination, technology adoption, weak market linkages, and exploitation by middlemen. Moreover, the R&D organizations and the policy planners are handicapped due to the non-availability of big reliable data in real-time.

Intelligent Apple Production System "AppleDoc" is a one-in-all solution. This tool is compliant with the agriculture 4.0 revolution, location-specific and custom advisory for farmers from bloom to the basket, an e-commerce web portal for farmers and input suppliers, and mandis (markets), AI, and ML-driven R&D platform. It is based on data analytics and has experts on-call with IBM Watson, MS Azura, and RIMPRO integrated at the back end.

Component 1b: Centres for Advanced Agricultural Sciences and Technology

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

Success story

Developed artificial intelligence wood identification model

Dr Z.P. Patel released the brochure of the Xylorix wood identification artificial intelligence (AI) model, Hon'ble Vice-Chancellor, NAU, Navsari, in the Hackathon event on "Smart and Remunerative Farming" held on March 5th, 2022. This wood identification AI model was developed for three selected Indian timber species *viz.*, Teak (*Tectona grandis* L.f.), Malabar neem (*Melia dubia* Cav.), and Ardu (*Ailanthus excelsa* Roxb.) using Xylorix (https://www.xylorix.com/) platform. This AI model on wood identification is the first of its kind to be developed in India on the Xylorix platform. The three AI models are available in the Xylorix Inspector mobile app under the name of Navsari Agricultural University (NAU) Model Album. This work has been initiated and led by Dr Satish Kumar Sinha, Assistant Professor (Wood Science & Technology), through the ICAR & GoI sponsored NAHEP CAAST sub-project at NAU, Navsari. These expert-trained AI models are able to identify their assigned wood species through image recognition by looking at the magnified pictures of the wood end-grain surface. Having these AI models, with very little training, non-wood anatomical experts such as customs officers, farmers, border patrol, and timber traders are able to quickly verify the said woody species to prevent adulteration and illegal transportation of mislabeled woods in the field with just a knife, an illuminated macro-lens, the Internet connection and access to the models using the Xylorix Inspector mobile app.
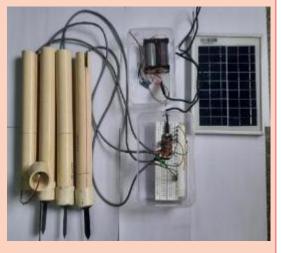
Name of the institute: Punjab Agricultural University, Ludhiana, Punjab

Success story

Developed soil moisture sensor system for real-time monitoring of social moisture to help optimize the amount and time of irrigation

Real-time monitoring of soil moisture can provide useful information for optimizing the amount and timing of irrigation. Among the range of different soil water sensing technologies, capacitance-type soil moisture sensors are the most popular because of their cost, reasonable robustness and precision, low power consumption, and low maintenance requirements. However, these sensors are not popular among farmers as these sensors give good accuracy in laboratory conditions; in field conditions, they show large sensor-to-sensor variability. One explanation for this variability is that they only perceive a small volume of soil (in the order of 1 dm3), which makes them very sensitive to local variations, for example, gravel content, bulk density, soil salinity, the existence of macropores and shrinkage cracks, the proximity of plant roots, and small-scale surface features. The objective of this study is to measure capacitive sensor measurements of SWC in laboratory conditions and to develop a dynamic programme to reduce variability among different sensors. The soil moisture sensors are more sensitive to either the recent balance of the last irrigation cycle or the aggregate balance of several cycles. Therefore, one constant value of sensor voltage cannot suggest irrigation scheduling. Therefore, a dynamic programme is required to process sensor voltage by comparing it with the voltage of the previous irrigation cycle. The developed sensor module performance was observed to be at par with the commercial soil moisture sensing module to monitor soil moisture in the field.

A low-cost sensor module was developed using the available sensors, microcontroller, buck-boost converter, solar panel, charging and discharging module, and battery. The soil moisture module consists of a capacitive moisture sensor that detects soil moisture. Four capacitive sensors were used with one microcontroller to make the module robust to soil moisture profile compaction and moisture variability. ESP 8266 microcontroller was programmed in Ardunio IDE in such a way that it records 60 values of voltage across all the capacitance sensors and sends its average value to the cloud server. The capacitance sensor was enclosed in a 40 mm PVC pipe having endcaps on both sides. The endcap on one side was slotted to place the soil moisture probe so that the sensing part of the probe comes out of the endcap and the circuit board remains enclosed in the PVC pipe. The epoxy resin was used to fix the sensor in the endcap to make the module water-resistant. In addition, silicone gel packs were placed inside the PVC pipe to avoid the effect of humidity change on the soil moisture sensor output. This ruggedness enabled the low-cost sensors to be used for monitoring soil moisture content at 20 cm or more depth. The low-cost sensor system was conceptualized, developed, and evaluated under the NAHEP CAAST-SNRM project that was compared with the commercially available sensors and found to be at par in moisture prediction. Therefore, the low-cost sensor system can be used in farmer's fields for the precise application of water.

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

Success story

Adoption of the Integrated Farming System (IFS) has significantly improved the livelihood of Mr Niranjan Kushwaha, Bokaro, Jharkhand

Shri. Niranjan Kushwaha, a resident of Sariya Village, Bokaro, Jharkhand, a resource-poor farmer owning 3 acres of land, went through a training programme of NAHEP-CAAST Project on Integrated Farming System and came in contact with the scientists of Birsa Agricultural University, Ranchi, Jharkhand. After gaining technical information from the training, he started cultivating vegetables (sponge gourd, ridge gourd, bitter gourd, cowpea, cucumber, tomato, chilli, etc.) using modern and scientific techniques on his farm and also started rearing two local breed cows and 6 Black Bengal goats (5+1) for his secondary income along with milk production, he is utilizing animal litters and dung for preparation of vermicompost and manures.

He participated in the demonstration of all the need-based knowledge and skills, including enrichment of manures and fertilizers, pest and disease management, and intercultural operations, in the different IFS Models developed by NAHEP-CAAST Project. Moreover, being a hardworking farmer, he grasped the technologies faster and implemented day to day activities of his farm.

With the intervention of the scientists of BAU, he started to cultivate different vegetable crops during both on and off-season on his farm, and as a result, he is fetching better value in the market. He made a profit of ₹1,50,000/- (approx.) by selling watermelons. ₹ 75,000/- from other vegetables after the first year. By adopting modern and scientific technologies and integrating the various components of IFS, he is now one of his village's emerging and leading farmers.

Mr Mukesh Kumar, Ranchi, Jharkhand, has become one of the emerging livestock and poultry rearing entrepreneurs

Mr Mukesh Kumar, after attending a lecture on "*Career and Entrepreneurship Opportunities in Livestock and Poultry Farming System*" conducted by NAHEP-CAAST Project on Integrated Farming System of Birsa Agricultural University, Ranchi, Jharkhand. He was highly motivated and decided to build his enterprise, "*Producer and Supplier of Livestock's*". He started RR enterprises in partnership with three persons.

At present, he is one of the emerging entrepreneurs of livestock in Ranchi, who is running an enterprise for the production and marketing of poultry birds (*Sonali* and *Kadaknath* breeds), duckery (mainly *Khakhi Campbell* breed), and goatery (mostly *Black Bengal* and *Beetal* breeds). His enterprise is capable of hatching about 2000-2500 poultry birds and 4000-5000 ducks, and he is trading more than 700 kids of goats per month. He has also attached more than 100 youths as vendors, who are producing and selling the livestock in different districts of Jharkhand with an annual turnover of approx. Rs. 10,00,000/-. Now, he is expanding his business in the Patna and Vaishali districts of Bihar by establishing the brood chamber for Sonali and Kadaknath poultry breeds.

C. Media coverage of project activities and achievements

Media plays a critical role in disseminating the focus of innovative projects, outcomes, and impact on the beneficiaries. In order to create a ripple effect and improve the visibility of the project, media coverage and advertisements are important tools. The media coverages of NAHEP are quite evident and act as a testimony of the successful activities and achievements carried out by awarded AUs under NAHEP.

D. Digital initiatives undertaken

Component 1a: Institutional Development Plan (IDP)

Awarded AUs have taken several digital initiatives such as the development of mobile or web-based applications in order to improve operational efficiencies, academic & teaching purposes, enhance connections with alumni etc. The ultimate aim to undertake such initiatives is to widen the horizon of the teaching scope and provide global-level learning to the students. This not only helps ICAR- AU system to readily adapt to meet the needs of new age industries while staying relevant but also improves the overall quality of agricultural higher education in the country.

Name of the institute: Acharya N. G. Ranga Agricultural University, Lam, Guntur (Andhra Pradesh)

S. No	Initiative	Brief	Photograph
1.	Alumni manage-ment portal https::://www.angraualumni.com	An Alumni management portal has been developed to establish linkage between alumni and institute	

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

S. No.	Initiative	Brief	Photograph
1.	University alumni portal (https://aims.jau.in)	University Alumni Portal has been developed for the establishment of linkage between alumni and institute	

Name of the institute: ICAR-National Dairy Research Institute, Karnal, Haryana

S. No	Initiative	Brief	Event Photograph
1.	Alumni portal (https://alumni.ndri.res.in/)	As of now, 1,911 alumni have enrolled to date on AMS. University has now activated the alumni portal and has initiated leveraging the alumni connections and network.	

Name of the institute: Sri Karan Narendra Agriculture University, Jobner, Jaipur, Rajasthan

S. No.	Initiative	Photograph
1.	AMS (Academic Management System)	
2.	Digitization of library	

Component 1b: Centres for Advanced Agricultural Sciences and Technology

Name of the institute: University of Agricultural Sciences, Bangalore

Sl. No.	Innovation	Photograph
1.	NGT-Agricultural Pest Prediction and Advisory (APPA) UAS, Bangalore Location-based Agricultural Pest Prediction and Advisory to the farming community	

E. List of participants present during the NAHEP PMC and AHEPC Meetings

List of participants present during 7th AHEPC Meeting held on 2nd April 2021	
S. No.	Members
1.	Dr R C Agrawal, National Director and Chairman
2.	Dr Rajendra Prasad, Vice-Chancellor, UAS-B & Member
3.	Sh Raju Barwale, Chairman, Mahyco & Member
4.	Dr Smt. Sudha Rao, Former Vice Chancellor & Member
5.	Dr C S Prasad, Former Vice Chancellor & Member
6.	Dr H.K. Senapati, Former Dean & Member

List of participants present during 9th AHEPC Meeting held on 15th September 2021	
S. No.	Members
1.	Dr R.C. Agrawal, ND NAHEP – Chairman
2.	Dr S. Rajendra Prasad, VC UAS-Bangalore – Member
3.	Dr J. P. Sharma, Vice Chancellor, SKUAST- K Jammu, Member
4.	Dr M. S. Chauhan, Director NDRI – Member
5.	Shri Raju Barwale, MD, MYHCO – Member
6.	Dr CS Prasad, Ex ADG, Director and Vice Chancellor – Member
7.	Dr Sudha Rao, Ex-Vice Chancellor, Member
8.	Dr H.K. Senapati, Ex Dean (PGS) – Member
9.	Professor Vijay, IIT Delhi - Member

List of participants present during 6th PMC Meeting held on 17th June 2021	
S. No.	Members
1.	Dr Trilochan Mohapatra, Secretary DARE & DG, ICAR
2.	Sh Sanjay Singh, Special Secretary DARE & Secretary ICAR
3.	Dr Gopal Krishna, Director, CIFE – ICAR, Mumbai
4.	Dr Bhupendra Nath Tripathi, DDG (Animal Sciences), ICAR
5.	Dr R.C. Shrivastava, VC, CAU Samstipur, Pusa
6.	Dr K.K. Narayanan, Managing Director, Metahelix Life Sciences, Bengaluru
7.	Mr S. Sivakumar
8.	Dr Anand Kumar Singh, DDG Horticulture
9.	Dr R.C. Agrawal, National Director, ICAR

List of participants present during 7th PMC Meeting held on 10th October 2021	
S. No.	Members
1.	Dr Trilochan Mohapatra, Secretary DARE & DG, ICAR
2.	Sh Sanjay Garg, Additional Secretary, DARE and Secretary ICAR
3.	Sh Sanjiv Kumar, Additional Secretary and Financial Advisor, ICAR
4.	Dr Bhupendra Nath Tripathi, DDG (Animal Sciences), ICAR
5.	Dr Anand Kumar Singh, DDG (Horticulture) ICAR
6.	Dr R.C. Shrivastava, VC, RPCAU, Samstipur, Pusa

List of participants present during 7th PMC Meeting held on 10th October 2021	
S. No.	Members
7.	Dr Gopal Krishna, Director, CIFE – ICAR, Mumbai
8.	Dr K.B Kathiria, VC-AAU, Anand
9.	Dr R.C. Agrawal, National Director, NAHEP

List of participants present during 8th PMC Meeting held on 23rd February 2022	
S. No.	Members
1.	Dr Trilochan Mohapatra, Secretary DARE and DG ICAR
2.	Sh Sanjay Garg, Additional Secretary DARE and Secretary (CAR
3.	Dr Bhupendra Nath Tripathi, DDG (Animal Sciences), ICAR
4.	Sh G.P. Sharma, Director, Finance
5.	Dr RC Srivastava VC Samstipur
6.	Dr Ravishankar, Director, CIFE
7.	Dr Sivakumar, Head (Agri & IT Business), ITC
8.	Dr Narayanan, Ex M.D., Metallics
9.	Dr K.B. Kathiria, Vice Chancellor, AAU Anand
10.	Dr R.C. Agrawal, National Director, NAHEP

F. List of approved 62 projects

Sub-component 1a: Institutional Development Plan (IDP)

S. No.	Name of University	IDP Title	PI / Coordinator	Contact No.	email
1.	NDRI, Karnal	Incentivizing Dairy Education through Innovative Learning Approaches	Dr Bimlesh Mann, Principal Scientist (Dairy Chemistry)	9896245110	Bimlesh.mann@icar.gov.in
2.	CCSHAU, 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 P. K. Singh PI, IDP NAHEP Dean CTAE	6375371965	idpmpuat19@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 A. PRATAP KUMAR REDDY Dean of Agriculture	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@skuast-kashmir.ac.in

S. No.	Name of University	IDP Title	PI / Coordinator	Contact No.	email
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
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 outcomes and entrepreneurship development	Dr P.U. Krishnaraj, Professor	0836-2214281; 9845906301	krishnarajpu@gmail.com
14.	RVSKVV, Gwalior	Reinforcement of the brand value of the university for designing market-ready graduates for entrepreneurship and employment generation	Dr Sanjay Kumar Sharma, Professor & Head, Department of Soil Science & Agricultural Chemistry	9893946434	sanjay-jbp.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 Resources 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
19.	UHS, Bagalkot	Innovative Pedagogical Designs to Augment Entrepreneurial Competency and Employability	Dr R. K. Mesta,	9448640881	rkmesta@yahoo.com

S. No.	Name of University	IDP Title	PI / Coordinator	Contact No.	email
20.	UAHS, Shivmoga	Developing Industry Ready, Skill Embedded Agriculture Technocrats	Dr K. C. Shashidhar,	7892033185	idp@uahs.edu.in/ shashidhar.kumbar@gmail.com
21.	Dr BSKKV, Dapoli	Institutional Development for Enhancing Learning outcome, Academic Diversity, Entrepreneurship and Employability	Dr Prashant S Bodake, Department of Agronomy	9420413255	piidpdbskkv@gmail.com
22.	SKAUST, Jammu	Strengthening Institutional Capacities for Delivering Competent Skilled Professionals	Dr B. C. Sharma	9419152428	drbhagwati@gmail.com, idp.jammuskuast@gmail.com

Sub-component 1b: Advanced Agricultural Science and Technology (CAAST)

S. No.	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 Viswavidyalaya 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
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

S. No.	Name of University	Project Title	PI Name	Contact No.	Email
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, Thrissur	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

S. No.	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@iabm-biker.org

S. No.	Name of University	Project Title	PI Name	Contact no.	Email
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	suren-kalbande@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 -	DrI.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	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	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

S. No.	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, Cooch Behar	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, Kolkata	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	drp-biswas1956@gmail.com
18.	VCSGUH&F, Bharsar	Strengthening of VCSG Uttarakhand University of Horticulture and Forestry, Bharsar	Prof. B P Nutiyal	9412986036 7351939177	deanhort-bharsar@gmail.com, bhagwatinauti-yal@gmail.com
19.	IGKV, Raipur	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 centre for accreditation	Professor Sunil Maherchandani	9351205627	smchan-dani86@gmail.com

Component 2A

S. 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

G. 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 the 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, (Sub-component: 1c)
5.	Dr Hema Tripathi, National Coordinator, (M & E and Nodal officer- ES and SS Measures)
6.	Mr Dilip Roy, Deputy Secretary
7.	Mr N. K. Arora, Deputy Director-Finance
8.	Mrs. Ritu Chahal, F&AO
9.	Mrs. Sunita Dhingra, Section Officer
10.	Mr Vishwa Ratan Bharati, Assistant
11.	Smt. Suman Lata

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

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

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