# INTERNATIONAL CONFERENCE ON BLENDED LEARNING ECOSYSTEM

## for Higher Education in Agriculture

ICBLE 2023

# SOUVENIR

ICBLE 2023

# International Conference on Blended Learning Ecosystem for

## Higher Education in Agriculture

# SOUVENIR

ORGANIZERS

NAHEP | ICAR | THE WORLD BANK IBRD • IDA | WORLD BANK GROUP

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**NARENDRA SINGH TOMAR**
D.O. No. 353 /AM

सत्यमेव जयते

आज़ादी का अमृत महोत्सव

कृषि एवं किसान कल्याण मंत्री
भारत सरकार
कृषि भवन, नई दिल्ली
**MINISTER OF AGRICULTURE & FARMERS WELFARE**
**GOVERNMENT OF INDIA**
**KRISHI BHAWAN, NEW DELHI**

## MESSAGE

For fulfilling India's aspirations of becoming a $5 trillion economy by 2025 and making India "Aatmanirbhar", Agriculture sector of India has a major role to play. To accelerate this, we need the support of talented and bright young people of this country, to lend their intelligence and new ideas. It is a great matter of pride that, Indian Council of Agricultural Research (ICAR) has undertaken a development initiative to make agricultural education system resilient.

To undergo this marvellous transformation, ICAR along with World Bank is organizing an International Conference on Blended Learning Ecosystem (ICBLE), on 21-23 March 2023 at New Delhi. The conference focuses on learning and collaborating with the global institutions, in consonance with wider emerging trends. Several plenary talks, keynotes and panel discussions would be organised on current relevant issues paving way to various leading research and practices in the field of blended learning.

It is important to strengthen the digital backbone of agricultural higher education institutes to enable evolutionary, scalable, resilient and sustainable learning and this conference would be a major step towards achieving this goal.

I applaud the efforts of organizers to align agricultural higher education with National Education Policy 2020. I am sure this International Conference shall significantly help in "Transforming agriculture for a better tomorrow".

I convey my best wishes for the grand success of this Conference.

7/3/23

**(Narendra Singh Tomar)**

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MINISTER OF STATE FOR AGRICULTURE
& FARMERS WELFARE
GOVERNMENT OF INDIA

# MESSAGE

It is a matter of great pleasure to learn that the International Conference on Blended Learning Ecosystem (ICBLE) for Higher Education in Agriculture, 2023 during 21-23 March 2023 at New Delhi, [is jointly hosted by Indian Council of Agricultural Research (ICAR) and the World Bank].

The main focus of the conference is to identify the best strategies in blended teaching-learning and then to develop collaborations, partnerships and associations with those who are working in this area. The discussions to be organised on the themes already identified and will bring out the essence of developing the blended learning ecosystem for agricultural higher education.

The conference will provide a platform for the exchange of ideas and developing associations to make a substantial contribution to the agricultural higher education.

I wish the conference a great success.

**(Kailash Choudhary)**

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शोभा करांदलाजे
**SHOBHA KARANDLAJE**

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**Minister of State For**
**Agriculture & Farmers Welfare**
**Government of India**
D.O. No...163.....MOS(A&FW)/VIP/2021-22/

**Dated: 20.03.2023**

## MESSAGE

It is heartening to learn about the International Conference on Blended Learning Ecosystem (ICBLE) for Higher Education in Agriculture hosted by Indian Council of Agricultural Research (ICAR) along with World Bank, during 21-23 March 2023 at New Delhi.

The pandemic has paved the way for a hybrid model in education combining digital and traditional methods of teaching and learning. This digital transformation in the agricultural education and research system cannot be emphasized enough to make it stronger and more resilient. The new paradigm of digital agricultural education system encompasses disruptive technologies aimed at strengthening the agricultural education system by improving the quality, learning outcomes and enhancing the access to high quality education through appropriate, effective and interactive digital learning channels.

This conference will serve the purpose of learning from the global best practices in blended teaching – learning and evaluate the best strategy to implement the blended learning platform in our agricultural universities.

I take this opportunity to convey my deep regards to the organizers and wish them a great learning session.

Shobha Karandlajji

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आज़ादी का अमृत महोत्सव

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कृषि एवं किसान कल्याण मंत्रालय
कृषि एवं किसान कल्याण विभाग
Government of India
Ministry of Agriculture & Farmers Welfare
Department of Agriculture & Farmers Welfare

# MESSAGE

Agriculture not only provides food and raw material but also offers employment opportunities to a considerable proportion of the population. Hence, the agricultural education system embodied with the latest advances in technologies and management strategies is important. Agricultural education and extension have been geared to harness the modern science and technology for higher productivity and production. This substantially helped to reduce the food scarcity in India.

I am pleased to know that an International Conference on Blended Learning Ecosystem for Higher Education in Agriculture is scheduled to be held from 21 to 23 March, 2023 which will offer a premise for global experts to gather and interact intensively on digital transformations and technological advancements in higher education, innovation in teaching-learning and all this to address the goal for establishing a resilient education ecosystem in agriculture higher education.

This conference is a unique forum for exchange of innovative ideas, technical expertise for technological advancements in higher education. I hope eminent speakers from across the globe will cover the theme of the conference from different perspectives and will definitely offer many new insights.

I congratulate the organisers of the conference and wish a grand success to the conference.

**(Manoj Ahuja)**

March 17th, 2023

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

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

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## MESSAGE

According to the Niti Aayog, agriculture and allied sector in India contributes 18.29% of the Gross Value (GVA) added of the economy and employs more than 45.6% of the workforce. Farmers are adopting new technologies to improve and monitor crop health and production. The true adoption of blended learning has immense potential and can unlock the agriculture economy to new heights.

I am pleased to learn that the International Conference on Blended Learning Ecosystem (ICBLE) for Higher Education in Agriculture, is being jointly hosted by Indian Council of Agriculture Research (ICAR) and the World Bank during 21-23 March 2023 at New Delhi. ICAR-Indian Agricultural Statistics Research Institute (ICAR-IASRI) under the National Agricultural Higher Education Project (NAHEP) project is organising this conference.

The motivation behind organisation of this conference is of topical interest. The pandemic and the increasing use of technology in education it had prompted, has added renewed energy to the blended learning movement. Blended learning has long been known to be more effective than either of its constituents – namely in-person learning or online learning and that makes this conference very timely planned.

I am assured that the discussions by eminent people from academics, research & development, industries, educational institutions, agricultural universities around the world, would enrich our knowledge and guide us in enhancing and strengthening the blended learning ecosystem for agricultural higher education in India.

I wish great success to the organizers and hope that this joint effort of all stakeholders will contribute significantly for the all-round, holistic well-being of the learners.

**(Himanshu Pathak)**

**17th March, 2023**
**New Delhi**

सत्यमेव जयते

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DEPARTMENT OF AGRICULTURAL RESEARCH AND EDUCATION
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## MESSAGE

Indian education system has long excelled in the field of research and knowledge sharing, and to foster innovative tools for education, the Indian Council of Agricultural Research (ICAR) and the World Bank are jointly hosting the "International Conference on Blended Learning Education for Higher Education in Agriculture" from March 21 to 23, 2023.

As the world transitions from offline to online education, traditional modes of education are being continually challenged. In the past two decades, the education sector has diversified with the use of transformational technologies. Digital transformation is redesigning the scenario of teaching-learning and enabling innovative distribution of education across time space. Concept of blended learning has already introduced a revolutionary change in the learning process by integrating traditional learning with innovative means. In this context, ICBLE 2023 is a well thought of an event at the right time.

Organized by ICAR-Indian Agricultural Statistics Research Institute (IASRI), New Delhi, the conference would act as a platform for the exchange of ideas and concepts for researchers, academicians and professionals from the field of agricultural research. The timing of the conference coincides with India's G20 presidency which further accentuates the impact of such initiatives.

I extend my best wishes for the grand success of the Conference.

**(Sanjay Garg)**

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## MESSAGE

Investment in quality education has been one of the focus areas of the union government for the past eight years. Indian economy with its investment in education and training has emerged as a bright spot in the world. ICAR has been trying to diversify the modes of education delivery. We know that World Bank has been associated with ICAR in creating several relevant and far-reaching solutions for agricultural higher education like National Agricultural Higher Education Project (NAHEP).

It is a delight to know that the "International Conference on Blended Learning Platform for Higher Education in Agriculture" hosted by ICAR and the World Bank during 21-23 March 2023 is a significant event that will provide an exclusive forum for brilliant minds to collaborate and exchange ideas on the future of technology-enabled higher education in agriculture.

The progress made by India in the arena of economy, digital initiatives, education, science and technology are being closely observed by the world over. India is poised to become a global leader in agricultural education and conferences like these will help to achieve that purpose. India is set to create a template for many other developing countries.

I wish the conference and ICAR all success.

**Alka Nangia Arora**
Addl. Secretary & Financial Advisor
DARE/ICAR

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राष्ट्रीय निदेशक, राष्ट्रीय कृषि उच्चतर शिक्षा परियोजना

**Dr Rakesh Chandra Agrawal**
Deputy Director General (Agril. Edn.) &
National Director, NAHEP

March 20, 2023

**Message**

With India poised to have the largest number of young people globally by 2030, investing in human capital is the priority to make the most of this evolving economic opportunity, this necessitates the need for our agricultural education system to evolve in sync with the fast changing national and international scenario to reap the benefits of digitalization of education that can fundamentally change how we learn and what we learn. The need for bringing in digital transformation in the agricultural education and research system cannot be emphasized enough to make it stronger and more resilient.

The International Conference on Blended Learning Ecosystem (ICBLE) for Higher Education in Agriculture is being organized by Indian Council of Agricultural Research (ICAR) along with The Work Bank during 21-23 March 2023. The focus of the conference is to strengthen collaboration among multiple implementing agencies working in the domains of remote learning, digital education and blended education systems. It will also help in establishing synergies with flagship programs such as Digital India and Skill India to accelerate deployment of Resilient Agricultural Education System (RAES) under NAHEP.

The aim of this conference is to facilitate the development of a global ecosystem of partners from academia, industry, government, and multilateral and bilateral organizations who would provide critical insights towards design and full-scale implementation of all aspects of the Resilient Agricultural Education System (RAES) under NAHEP, that is, learning management system, content repository, and system-wide capacity building. Apart from the engaging discussions the three-day event will also showcase an exhibition on the diverse range of services and offerings in the field of agriculture and blended learning.

I applaud and appreciate the commitment of organizers for undertaking this initiative to strengthen the agricultural ecosystem and inculcating a digital change in the academic arena under NAHEP to further strive and improve the system to make it robust.

Appreciations to ICAR-Indian Agricultural Statistics Research Institute and PIU-NAHEP for putting this together. Good Luck!

**(R.C. Agrawal)**

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डॉ. राजेन्द्र प्रसाद
निदेशक
**Dr. Rajender Parsad**
Director

## MESSAGE

It is a proud moment for me to apprise about the organisation of the International Conference on Blended Learning Ecosystem for Higher Education in Agriculture (ICBLE 2023) hosted by ICAR and World Bank and organized by ICAR-Indian Agricultural Statistics Research Institute (IASRI) and PIU-NAHEP.

The agricultural and allied sectors are significant contributors to employment in India, and innovation and research are critical drivers of these sectors. As such, advancements in research and educational initiatives in higher education can help the sector as a whole. World Bank and ICAR have been pivotal in transforming agricultural higher education with the inception of National Agricultural Higher Education Project (NAHEP). Under NAHEP, Resilient Agricultural Education System (RAES) has been conceived as an all-around solution to bring to life the larger vision of **Strengthening the digital backbone of agricultural higher education institutes**, to enable evolutionary, scalable and sustainable learning. RAES seeks to achieve the key recommendations of the National Education Policy 2020 by providing uninterrupted access to quality education, increasing employability, and developing stronger industry-academia partnerships. To accomplish this goal, ICAR-IASRI is working to bolster the university system's digital/IT infrastructure by leveraging virtual classrooms, AR/VR labs, blended learning platforms, and e-learning content. ICBLE 2023 is a well-timed step towards transforming and modernizing agricultural higher education in India.

The conference aims to foster collaboration and knowledge sharing for the development of a state-of-the-art blended learning ecosystem for agricultural higher education in India. This conference will help to develop a strategy for accelerating the implementation and adaptation of new innovative technologies under the Resilient Agricultural Education System (RAES) initiative in alignment with NEP 2020.

I am confident that ICBLE 2023 will provide a leading forum for the finest brains in research, education, industry and government to interact, exchange ideas and draw insights from the global experiences of Higher Agriculture Education. Knowledge gained and recommendations of this Conference will help in making agricultural education future ready in India leading to employability and entrepreneurship.

I wish the Conference a grand success.

March 18, 2023
New Delhi

**(Rajender Parsad)**

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ICBLE 2023

# PREFACE

The Indian Council of Agricultural Research (ICAR), the apex body for co-ordinating, guiding and managing research and education in agriculture, and World Bank have come together to announce the first International Conference on 'Blended Learning Ecosystem for Higher Education in Agriculture' in India under the National Agricultural Higher Education Project (NAHEP). The three-day event to be held from March 21-23 in New Delhi will be hosted by ICAR - Indian Agricultural Statistics Research Institute (IASRI), which is a multi-partner global forum to support collaboration for development of state-of-the-art blended education system for higher agricultural education.

The aim of this conference is to facilitate the development of a global ecosystem of partners from academia, industry, government, and multilateral and bilateral organizations who would provide critical insights towards design and full-scale implementation of all aspects of the Resilient Agricultural Education System (RAES) under National Agricultural Higher Education Project (NAHEP), that is, learning management system, content repository, and system-wide capacity building. Apart from the engaging discussions the three-day event will also showcase an exhibition on the diverse range of services and offerings in the field of agriculture education and blended learning.

Furthermore, these insights would be utilized towards strengthening the quality of the full-scale implementation of this development initiative. The amalgamation of leading practices as identified during the conference would serve as a knowledge, to be utilized by various education systems to adapt and emulate in their own countries. This would strengthen the collaboration among multiple implementing agencies working in the domain of digital education and blended learning ecosystem and provide strategies for making this digital transformation sustainable.

The digital initiatives are focused to empower the students/faculties and administration in one way or the other and transform the agricultural education system across the country. The agricultural education system is evolving for the sake of betterment, as this generation of students are not born to be confined to the limits of simple learning; their curiosity is vast and cannot be catered with the legacy education systems.

We would like to thank each and every one of the participants who have contributed directly and indirectly for the success of this International Conference on Blended Learning Ecosystem for Higher Education in Agriculture. We would also like to convey our thanks to World Bank, Staff of ICAR Headquarters, Project Implementation Unit of NAHEP, ICAR - IASRI and special thanks to the team from EY LLP, PwC and Pavilion and Interiors for their technical inputs and support in organization and management of this International Conference.

**Organizing Secretaries**
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National Coordinator, NAHEP (Component 2 and CAAST), ICAR
Sudeep Marwaha
PI NAHEP-RAES & Principal Scientist, ICAR–IASRI, New Delhi

ICBLE 2023

# CONTENTS


| ARTICLES | | Pages |
|---|---|---|
| 1. | **National Agricultural Higher Education Project (NAHEP), Transforming Agricultural Higher Education System**<br>**The World Bank** | 17-18 |
| 2. | **Heralding the New Era of Agricultural Higher Education in India under National Agricultural Higher Education project (NAHEP)**<br>**PIU-National Agricultural Higher Education Project** | 19-29 |
| 3. | **Making Agricultural Education System Resilient under National Agricultural Higher Education Project (NAHEP)**<br>**ICAR-Indian Agricultural Statistics Research Institute (IASRI)** | 30-37 |
| 4. | **Transforming Agriculture for Better Tomorrow: ICAR's First International Conference on "Blended Learning Ecosystem for Higher Education in Agriculture"** | 38-42 |
| **ABSTRACTS OF KEYNOTES** | | 43-84 |
| 1. | **Modernization of Agricultural Higher Education in India & The Roadmap for Implementation of New Education Policy 2020**<br>Dr. R C Agrawal<br>DDG (Agricultural Education) & ND, NAHEP | 46-47 |
| 2. | **Blended Learning - New Opportunities for Higher Agriculture Education in India**<br>Mr. Bekzod Shamsiev<br>Task Team Leader (TTL), NAHEP, The World Bank, Washington, USA | 48 |
| 3. | **Drawing from Global Experiences of Higher Agriculture Education and Innovation on Agriculture and Agribusiness Development**<br>Mr. Werner Wutscher<br>Former Secretary General, Federal Ministry for Agriculture, Environment, Forestry, and Water Management, Austria | 49-50 |
| 4. | **Steering Tertiary Education Toward Resilient Systems That Deliver for All**<br>Mr. Denis Nikolaev<br>Senior Education Specialist, World Bank | 51-52 |
| 5. | **National Agricultural Research and Education System-Blended Learning Platform (NARES-BLP)**<br>Dr. Sudeep Marwaha<br>Principal Investigator, NAHEP-RAES & Principal Scienist, ICAR – IASRI,<br>New Delhi | 55-56 |
| 6. | **Flipped Classroom Model for Self-paced Learning in Veterinary Education**<br>Dr. Surinder Singh Chauhan<br>Senior Lecturer Animal Science, School of Agriculture and Food, Dookie Campus, Dookie College, Victoria 3647, The University of Melbourne, Australia | 57-58 |
| 7. | **Integrating Innovation and Entrepreneurship in Agricultural Education**<br>Prof. Perry Den Brok<br>Professor, Department of Social Sciences, Wageningen University, Netherlands | 59-60 |
| 8. | **Blended Learning and Emerging Artificial Intelligence Technologies**<br>Dr. Glen C. Shinn<br>Professor Emeritus, Department of Agricultural Leadership, Education and Communications Texas A&M University, USA | 61 |
| 9. | **How Virtual Reality is Changing Education and Research**<br>Mr. Harshavardhana Kikkeri<br>Chief Executive Officer and Chief Technology Officer, Holosuit – Holoworld, India | 62-64 |

| | | |
|---|---|---|
| 10. | **Change Leadership for Blended Learning in Higher Education: the Case of Malawi, the Warm Heart of Africa**<br>Dr. Joshua Valeta<br>Director, Open, Distance and e-Learning, Ministry of Education, Malawi Government, Malawi | 65-66 |
| 11 | **Digital tools & E.N.H.A.N.C.E. Learning Model**<br>Dr. Morris Thomas<br>Assistant Provost, Digital and Online Learning & Director of the Center for Excellence in Teaching, Learning, and Assessment, Howard University, Washington, USA | 67-68 |
| 12 | **Economic returns to agricultural research and development**<br>Dr. Evgueni Poliakov<br>Founder, Netherlands Economic Observatory, Netherlands | 69 |
| 13 | **New Education Technology in Agricultural Education**<br>Dr. Alex Twinomugisha<br>Senior Education Technology Specialist, The World Bank, Washington, USA | 72 |
| 14 | **Digital Disruption for Sustainable Agriculture**<br>Mr. Sudhir Kadam<br>Venture Partner, and Corporate Innovation Strategist, Mountain View, California, USA Digital Disruption for Sustainable Agriculture | 73 |
| 15 | **Turning a Negative into a Positive: How Mandatory Use of Asynchronous Communication Technologies During the COVID-19 Lock Down Period Inspired Continued Use of Blended Learning Tools in the Classroom.**<br>Dr. Sidas Saulynas<br>Lecturer, UMBC, Information Systems Department, Maryland, USA | 74 |
| 16 | **Education After a Global Pandemic - Seeking a Sustainable Model**<br>Dr. Yanko Fernando Michea<br>Director, Learning and Information Technologies, College of Education, University of Washington, USA | 75-76 |
| 17 | **Making the Most of the Digital in a Blended Learning Ecosystem**<br>Ms. Denise Whitelock<br>Director, Open University, United Kingdom | 79-80 |
| 18 | **How Higher Education can be Connected to Community Needs in NEP 2020 through Unnat Bharat Abhiyan**<br>Mr. Virendra Kumar Vijay<br>National Coordinator, Unnat Bharat Abhiyan, Ministry of Education, GOI | 81-82 |
| 19 | **National Portal of India, Open Data Government Platform**<br>Ms. Alka Mishra<br>Deputy Director General, National Informatics Centre, MeitY, New Delhi | 83 |
| **PANELISTS** | | 85-103 |
| **ABOUT ORGANIZERS** | | 105-107 |
| 1 | Indian Council of Agricultural Research | 105 |
| 2 | The World Bank | 106 |
| 3 | ICAR-Indian Agricultural Statistics Research Institute | 107 |
| **ORGANIZING COMMITTEES OF ICBLE** | | 108-113 |
| 1 | Advisory Committee | 109 |
| 2 | Organizing Committees | 109-113 |

# National Agricultural Higher Education Project (NAHEP), Transforming Agricultural Higher Education System

## The World Bank

The NAHEP project has met or exceeded almost all of the targets it set. It significantly exceeded its targets for the quality of students entering Agricultural Universities, for their job placement rate after graduation and for faculty research effectiveness, whilst the total number of beneficiaries was almost four times the target value. The aim that half of all beneficiaries should be women has not yet been attained, but once students come into the system, it is thoroughly inclusive for both men and women, Scheduled Castes and Scheduled Tribes.

In terms of intermediate results, the project was particularly successful in increasing the number of cutting-edge industry-sponsored projects and positions, and in helping AUs obtain accreditation and autonomy. Satisfaction with ICAR's quality-assurance role increased amongst both students and staff, though the improvement in staff satisfaction fell short of target.

Looking at the detailed goals for each component, almost every target was met or exceeded. The number of direct beneficiaries was more than twice the target value, as was the number of training programmes run for students and for staff. The placement rate for postgraduate students increased by 10 % but could not match the spectacular 60 % increase in the placement of graduates. Many of these project achievements brought universities into new areas, such as teaching communication, entrepreneurial and leadership skills, information processing, and creative and innovative thinking. More industry-oriented courses were launched, and more technologies commercialized.

Progress was particularly rapid in embracing e-learning as both a necessary response to the Covid pandemic and as an opportunity in its own right. Over 200 new e-learning initiatives were launched, including the ICAR-wide online learning platform "MOOC", and a vast quantity of new digital content was created. Multiple universities established virtual classrooms, digital libraries and digital classrooms – physical spaces with IT and audio-visual equipment to allow a seamless blend of personal and virtual teaching.

The clear improvements in the quality of students entering Agricultural Universities, in their job placement rate once they graduate, and in research effectiveness and cooperation with industry, show that the ICAR institutions have become markedly better at performing their core roles of teaching and research, and of ensuring that this knowledge finds its way into practice. The substantial progress made in agricultural university accreditation and autonomy leaves these universities in a strong position to continue adapting and improving.

The fact that NAHEP achieved so much, despite the massive disruptions of the third most lethal pandemic in human history, demonstrates how effectively the project, ICAR, the universities and their students and staff adopted new ways of working and made them a success. Sometimes seen as lacking in innovation and new blood, the Agricultural Universities have shown that they can change, innovate and embrace new ideas, given the right support and leadership. The challenge now will be to maintain this momentum as the NAHEP project draws to a close and the pressure of Covid eases off.

Covid left the university world with no alternative but to try new approaches. Now that face-to-face teaching has resumed, the question is which of these should be put back on the shelf for the next crisis, what- or whenever that may be, and which should be made part of everyday teaching? Five opportunities in particular stand out:

1. **Video and online material** can make lectures richer, allowing students to see places they could not visit, watch events they would rarely encounter, and learn direct from the world's leading experts. Content creators can put far more time and effort into a video that will be watched by thousands of students over the years, than into an individual lecture to a small group. Digital classrooms, such as many Agricultural Universities have established through NAHEP, allow lecturers to incorporate these materials into their own personalised teaching.
2. **Imaginative online exercises** can get students very involved, individually and in groups, and be much more hands-on than a traditional lecture or tutorial. Bespoke digital tools, such as the "Virtual Dissection Table" developed by one of the ICAR universities, allow students to try things that would otherwise be expensive or impossible.
3. **Online communication tools**, from bulletin boards to video meetings, create multiple new ways for staff and students to interact and bring new possibilities to make education accessible to students who are unable to attend university full-time. Posting recordings of lectures and seminars allows students to re-watch key material or to catch up after absence or illness.
4. **E-books and documents** can almost entirely supersede hard copy, reducing costs, increasing accessibility and allowing rich embedded content, mark-up and notes.
5. **Online learning platforms**, such as MOOC, can give a coherent structure to an entire course of study, with modules linked to their materials and a clear overview of progress made and of the road ahead. Almost any course would benefit from such a structure.

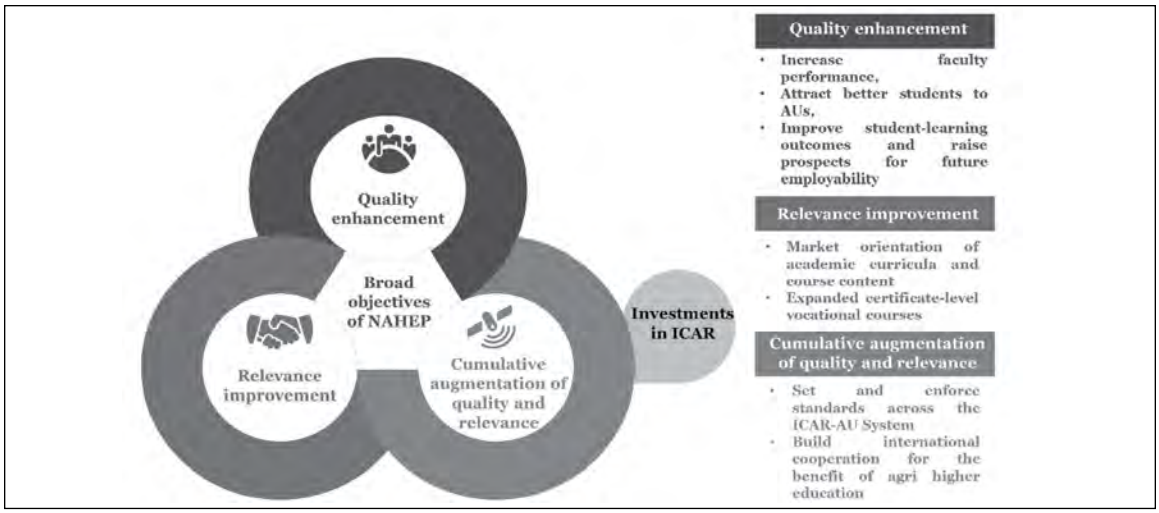
These are five ways, advanced massively during the time of Covid, in which Information and Communication Technology can make learning more effective, more efficient, and more fun. But students do not want to interact with a computer, they want to interact with other people, with a community of staff and students learning, sharing, discussing, and disagreeing. Perhaps the secret of those who really mastered the art of digital education are those who put communication at the center and made students feel connected even through the depths of lockdown.

# Heralding the New Era of Agricultural Higher Education in India under National Agricultural Higher Education project (NAHEP)


## Project Implementation Unit (PIU), NAHEP


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

### Broad objectives of the program



NAHEP is implemented by ICAR (GoI) and World Bank with the total project cost of USD 165 Million, having 50:50 cost sharing between GoI and World Bank. The project has been approved with an extension of one year and four months up to 31st March 2024. Placed below is the re-structured budget outlay considering 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) | 462.78 |
| 1b. Centres for Advanced Agricultural Science and Technology (CAASTs) | 308.00 |
| 1c. ICAR Innovation Grants to AUs | 96.22 |
| 2. Investment in ICAR in Agricultural Higher education | 188.00 |
| 3. Project Management and Learning | 45.00 |
| 4. Front-end Fee | 13 |
| Total | 1,100 |

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 Comp 2.

| **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 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 |

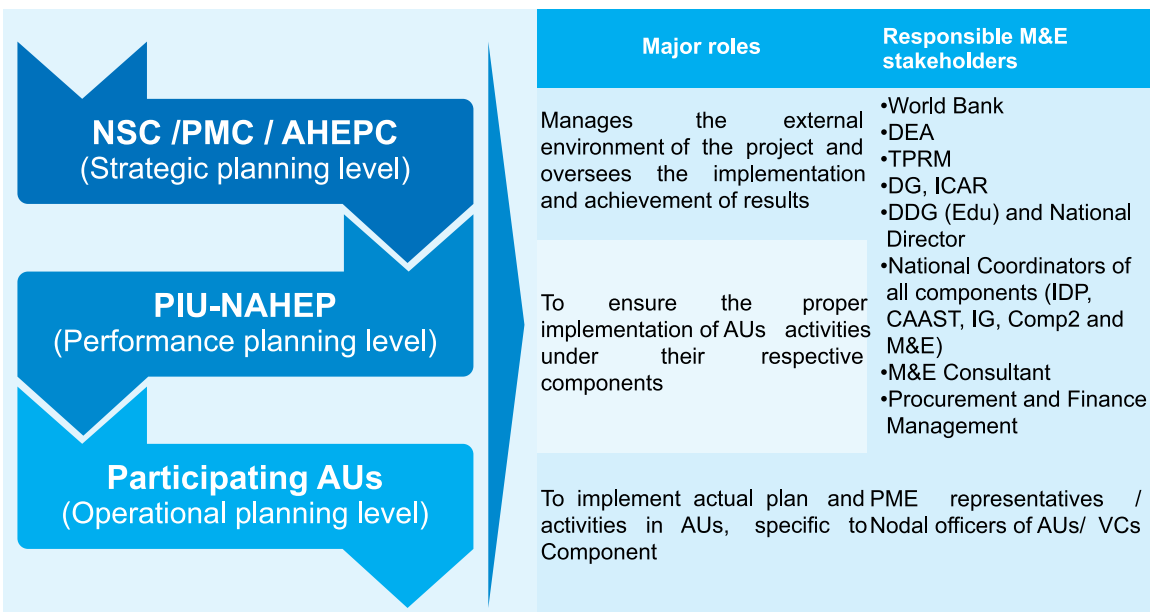
## Key beneficiaries of the project:

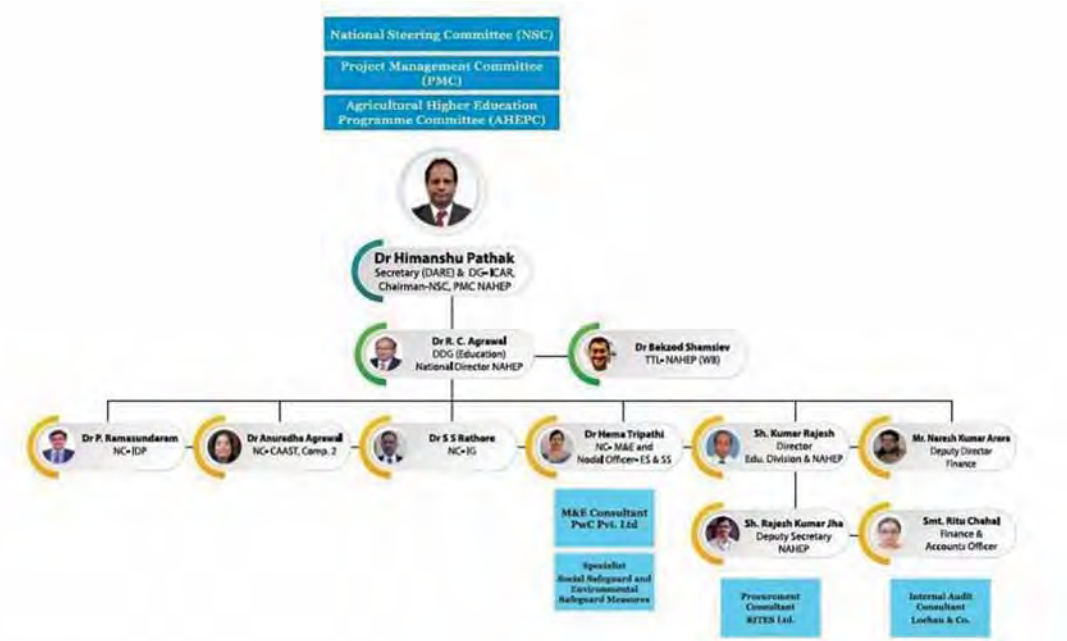
| Beneficiaries | Project benefits |
|---|---|
| Students | • Enhanced quality and relevance of teaching and research from new learning-centered education, which will leverage ICT and external partnerships;<br>• Effective stakeholder participation in curricula development, pedagogy options and course evaluation; and<br>• Expanded learning and academic environment that sharpen students skill sets for their improved employability. |
| Faculties | • Increased collaboration among Indian AUs and with other universities globally to raise research quality and educational quality and relevance;<br>• Training and capacity building to improve the delivery of education and its learning outcomes. |
| Institute | • Governance & transparency<br>• Infrastructural development<br>• Productive campus culture and Intensive use of technology enabled learning |

## Governance and monitoring mechanism of NAHEP:

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).

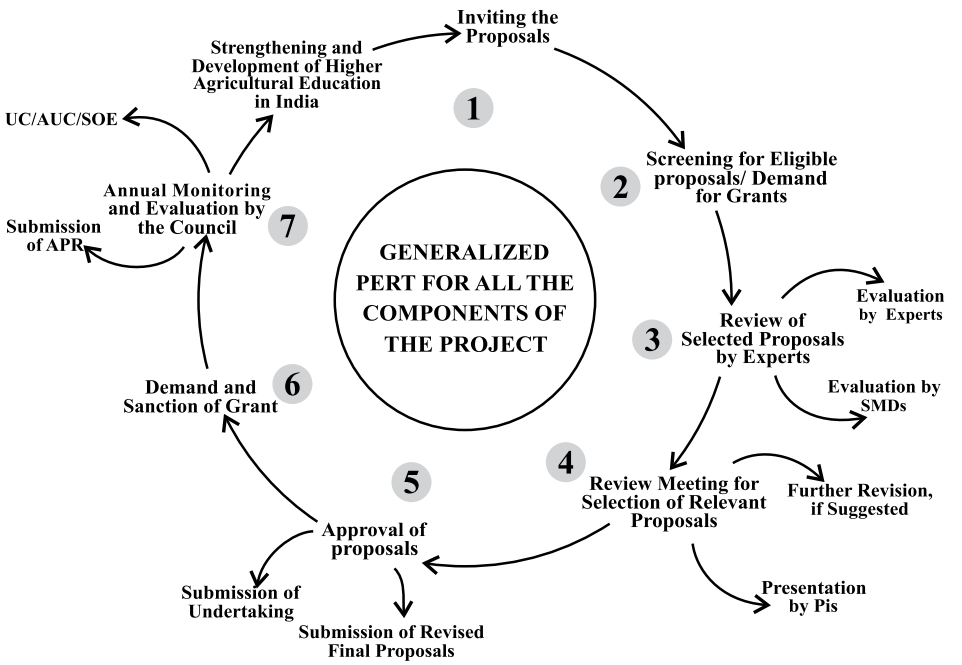
## Overall Governance structure for NAHEP implementation






**Program Evaluation Review Technique (PERT) of NAHEP**

# GENERALIZED PERT



**Enhancing quality and relevance of agri higher education under various components of project:**

Key provisions for funding under IDP include students' skill and entrepreneurial development, enhancing learning outcome and teaching effectiveness, faculty development and training, networking and industry collaboration, vocational training, students' job placement, own revenue generation and support to 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. 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.

The major activities undertaken by AUs under CAAST component include strengthening of teaching and research infrastructure, Distinguished Lecture Series/ Special lectures to bring about much needed vibrancy in the academic atmosphere and inspire students and faculties to perform better, National and international trainings for students, faculties and research scholars, Collaboration with private sector related to the specialized areas to develop market-oriented programs etc. CAAST Centres are acting as Centre of Excellence where focus is on emerging areas of agri and allied such as conservation agriculture, precision farming, secondary agriculture, genomics assisted breeding, food safety, big data analytics, market intelligence, next generation technologies, robotics etc.

Key IG activities include national level trainings for faculty upgradation, master and Ph.D. sandwich programs, alumni linkages, industry seminars and professional workshops, e- enabled learning activities etc. It is worth mentioning here that, in last 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 effectiveness in coordinating, guiding and managing agricultural higher education in the country. Till date, activities undertaken are strengthening of key digital infrastructures of ICAR AU system such as establishment of virtual classrooms at 18 AUs and effective implementation of Agri-DIKSHA web channel which has more than 3,000 e-contents developed and uploaded by partner AUs, establishment of AR/VR labs at partner AUs, launch of KVC-Alnet and facilitate the AUs for ensuring the alumni registration-so far more than 43,000 alumni have been registered on the portal etc. are some of the key initiatives undertaken during the period under Component-2 of the project.


**Evidence of attribution of NAHEP grants leading to project outcomes**

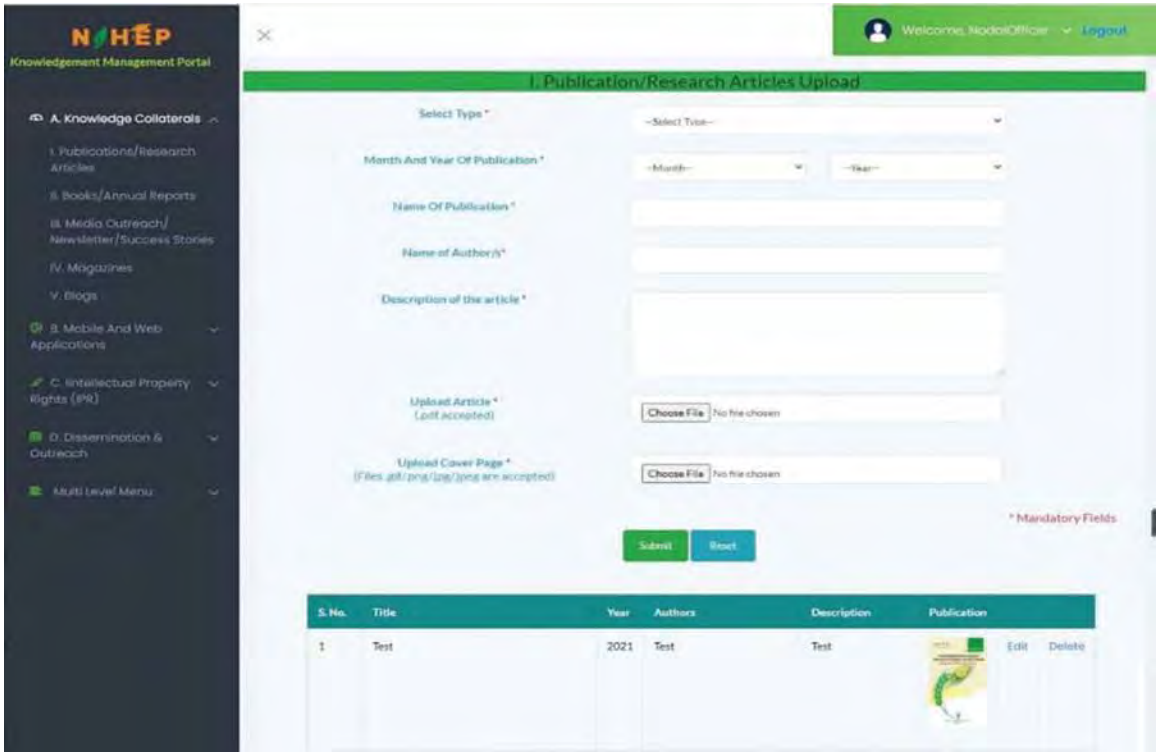
- Efforts made under the project have supported in increase in Au on time graduation rate from 77% in 2016-17 to 95.7% currently, whereas overall placement rate has increased from 41% in 2016-17 to 61% till 2022-23. So far, project has benefitted 4,59,879 students and faculties across the ICAR-AU System of which 35% are female beneficiaries.
- Benefitting 779 students and 229 faculties from 36 AUs have undergone international training in more than 110 HEIs and trained on more than 310 emerging areas of agri and allied. Among these trainings and workshops, high impetus has been given on enhancing employability and building entrepreneurship capabilities of agri students, so that the ripple effect of program in society could be enhanced. Moreover, industry visits and Skill development programs have also been organized majorly to cater the current market needs and enable the students to emerge as "Job Creators" rather than "Job Seekers". Focus of the international trainings for faculties have been on upgrading the existing pedagogy methodologies, enhance the research effectiveness, establish the linkages with international HEIs etc.

- Partner AUs have also developed 595 pilot course-curriculums/certificate courses on emerging areas of agri and allied sector under NAHEP. During the period over 5000+ trainings on these pilot courses were conducted and have ultimately benefitted more than 35,000 students.
- There are around 419 facilitative centers established for upscaling the academic and research infrastructure. Innovative infrastructure established by partner AUs such as digitization of classrooms, upgradation of education aids, development of language laboratories, upgradation of existing scientific laboratories. Over and above, partner AUs have also undertaken the out-of-box initiatives such as development of Learning and Assessment Centre with AR and VR facility, development of e-content studios, AI labs, etc. to allow students a world class learning experience

**Out of box initiatives to provide more relevant Agri higher education to students**

- In order to track the progress of various subprojects under components 1, 2 and 3 on an ongoing basis, Monitoring and Evaluation team of PIU-NAHEP has developed **Project Monitoring and Tracking System (PMTS).**
- KRITAGYA – A national level Agtech Hackathon: Organised 3 KRITAGYA Hackathons on Precision Farming, Livestock Farming and Speed Breeding in last three years respectively. Together ~1500 teams consisting 5000+ participants presented their innovative ideas. Winners of the KRITAGYA have won up to INR 9 Lakhs from each event.

- For an effective implementation of Knowledge management strategy in NAHEP, PIU NAHEP has developed a robust Knowledge management framework (KMF) and Knowledge management portal (KMP).




- Green and Clean Campus (GCC) Award: Organised GCC awards two times in last two years with an intention of turning the wasteful inefficiencies using conventional energy sources, GCC awardees have developed innovative strategies to develop their Green and Clean Campus. Winners of the GCC have won up to INR 28 Lakhs from each event.

- PIU NAHEP came up with a unique initiative of 'Waste to Wealth' under NAHEP, which in turn helped the students to build the entrepreneurial capabilities and motivated them to take up innovative ideas & actions for converting waste to wealth.
- PIU has also undertaken an important initiative to Promote Resilient Agricultural Education System (RAES) in Agri higher education. Initiative focuses on development of digital infrastructure, creation of digital content and facilitation of digital capacity building.
- 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". This study is based on evolving sectoral trends and aims to provide a holistic human resource market outlook for Agri and allied Sector in India for next 20 years.
- ICAR has been celebrating India's 75th Independence Year in FY2021-22. Towards this, NAHEP has undertaken an initiative to organize 75 guest lectures on various areas under 'Azadi Ka Amrut Mohatsav: 75 Guest Lecture Series'.


- NAHEP has also undertaken an initiative to prepare a model **project report encompassing strategies for IARI to secure among top 200 global ranking institutes within next three years.**

## Concurrent monitoring and timely evaluation of the project

- Central M&E team has taken some important initiatives through Process 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. This has not supported in effective monitoring of the project but also helped in timely disseminating the Learning and Achievements of the project.

## Nurturing social equity under NAHEP

- Equity Action Plan (EAP) has been developed the project 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.

- In order to establish a fair and transparent system, while effectively addressing the grievances of project stakeholders, a 3 tier Grievance Redressal Mechanism has also been established at PIU NAHEP and has been made fully operational.

**Leveraging NAHEP to bring environmental sustainability in ICAR AU ecosystem**

- NAHEP has been conducting environmental assessment to prepare EMF to ensure the sustainability of the project the components. EMF includes Environment Sustainable Plan (ESP), environmental concerns and initiatives of greening the agricultural curriculum. ESP comprises of safeguards (Legal compliances and Mitigation measures), Safeguard plus (Green Initiatives / Best practices) and Education & Awareness. Green initiatives are environmental friendly practices and education combines to promote sustainable and eco-friendly practices in the campus. For ideal educational institutional buildings, it's imperative to put in place sustainable environmental management in terms of green cover, solid, liquid and e-waste management, rain and roof water harvesting, water and energy conservation, waste reuse and recycling, to cite a few.

While exhibiting good progress on strategic as well as operational level, NAHEP has been rated 'Satisfactory' by World Bank for last three consecutive years. It is also noteworthy to mention here that the project's Monitoring and Evaluation (M&E) has been upgraded to 'Highly Satisfactory' rating from last two consecutive years due to its significant impact in improving the implementation performance of individual AUs and overall project.

# Making Agricultural Education System Resilient under National Agricultural Higher Education Project (NAHEP)

**ICAR-Indian Agricultural Statistics Research Institute (IASRI)**

A strong higher education system is a key prerequisite to achieve sustainable economic development. This necessitates building education systems on the foundation of four key education resilience approaches viz. manage and minimize adversity in education; use and protect positive engagement and assets in education communities; foster relevant community support and align education ecosystem services to effectively leverage available digital technologies and assets.

In this context, agricultural higher education institutions in India are at the precipice of multiple positive transformations. The past decade has witnessed multiple global disturbances that have provoked higher agricultural education institutions to adopt newer methods of teaching & learning and leverage the power of digital technologies for better quality delivery of education. Consequently, with ever growing macro complexities impacting delivery of agricultural higher education, most recently witnessed in the context of the protracted COVID-19 pandemic, it is vital to reimagine and repurpose the agricultural higher education landscape, in the Indian context.

Stimulated by the guidelines of the India's National Education Policy 2020, National Agricultural Higher Education Project (NAHEP), and Digital India, the Indian Council of Agricultural Research (ICAR) along with the World Bank have fostered the Resilient Agricultural Education System (RAES) development initiative.

The RAES takes a three-component approach towards improving systemic resilience of the Indian higher education system to improve student learning outcomes by way of strengthening "skill-based education", while minimizing learning discontinuity. The first component aims to strengthen existing Digital Infrastructure in Indian Agricultural Universities, while introducing an online learning platform. The second component is the development of a Digital Content Repository comprising of curated or created self-learning instructional material in various formats. The third component is a system-wide Digital Capacity Building Program that entails generalized as well as differential learning courses, allowing end users to improve their digital competence, knowledge and skills.

While multiple workstreams of this initiative are currently underway, the International Conference on Blended Learning Ecosystems for Higher Education in Agriculture is being hosted jointly by ICAR and the World Bank under NAHEP in March 2023. The conference is organized by ICAR - Indian Agricultural Statistics Research Institute (IASRI). The event is envisaged as a multi-partner global forum to support collaboration and partnerships for development of state-of-the-art blended

education system for higher agricultural education and formulation of strategies for accelerating the deployment of Resilient Agricultural Education System (RAES).

"I dream of a digital India where quality education reaches the most inaccessible corners driven by digital learning"

***-Shri Narendra Modi (Prime Minister of India)***

"The National Education Policy 2020 recognizes the importance of leveraging the advantages of technology while acknowledging its potential risks and dangers. It calls for carefully designed and appropriately scaled pilot studies to determine how the benefits of online/digital education can be reaped while addressing or mitigating the downsides."

Source: National Education Policy 2020

The global health pandemic has thrown new challenges in ensuring the continuity of education in basic and higher education institutions across the world. Education ecosystem experts and stakeholders in multiple countries are exploring alternative modes of quality education blended with traditional and in-person modes of education. While innovative digital tools and learning management systems have been leveraged to ensure remote learning, the solutions to complement lab-based learnings and in person mentoring are still in infancy. Accordingly, there is an unprecedented need and opportunity to evolve blended learning ecosystems that can fulfil the requirements of both remote as well as classroom/lab-based learning requirements. Fortunately, the technologies available today can be innovatively applied to achieve much needed cyber-physical integration in education systems.

In this regard, the National Education Policy 2020 of Government of India recognizes the importance of leveraging the advantages of technology while acknowledging its potential risks and dangers. Furthermore, the policy lays emphasis on shifting towards skills and competencies based educational training. It calls for carefully designed and appropriately scaled pilot studies to determine how the benefits of online/digital education can be reaped while addressing or mitigating the downsides. In the meantime, the existing digital platforms and ongoing ICT-based educational initiatives must be optimized and expanded to meet the current and future challenges of evolving blended education ecosystems to ensure quality education for all.

Higher Education sector is one of the worst hit sectors due to the COVID-19 pandemic. In the post-COVID world, the education sector has undergone massive transformation with digital tools and technologies becoming the mainstay of new educational ecosystems. To ensure transformation of education system with resilient and sustainable operations in post-COVID environment, following interventions are gaining ground:

a) Use of digital tools and technologies by higher education institutions including immersive technology and innovative new media tools.

b) Development of state-of-the-art blended learning ecosystems for holistic management of higher education.

c) Making free and open-source technologies and educational resources available to teachers and students in alignment with the recommendations of UNESCO's International Commission on Futures of Education authored report "Education in a post-COVID world: Nine ideas for public action".

Indian government is pioneering technology-driven education with the Ministry of Education, Government of India undertaking several initiatives to support the aspiring students ranging from learners in schools to postgraduates. A comprehensive initiative called PM eVidya was announced on May 17, 2020, which aims to unify all efforts related to digital, online, on-air education to enable equitable multi-mode access to education.

Agriculture is one of the mainstays of the Indian economy due to its significant role in livelihood, employment, and national food security. It is the source of livelihood for about 70 per cent of rural households in India. The sector is key to fulfilling India's aspirations of becoming a 5 trillion-dollar economy by 2025 and achieving the ambitious target set by Government of India to double the income of farmers by 2022-23. To realize this goal, there is an utmost need for a digital agricultural higher education system in India to evolve in sync with the fast-changing international scenario.

The Indian Council of Agricultural Research (ICAR) is the implementing agency for the World Bank funded National Agricultural Higher Education Project (NAHEP). This project has made major strides through enhancing the overall ecosystem for higher education in agriculture in India under various project components. The Indian Council of Agricultural Research (ICAR), is an autonomous organization under the Department of Agricultural Research and Education (DARE), Ministry of Agriculture and Farmers Welfare, Government of India. Established in 1929, ICAR is the apex body for coordinating, guiding, and managing research and education in agriculture including horticulture, fisheries, and animal sciences in the entire country.

## The Resilient Agricultural Education System (RAES)

The Resilient Agricultural Education System (RAES) aims to provide the following: Uninterrupted access to quality education and research for all stakeholders Help develop student capacity for enhanced employability outcomes aligned to market demand Proliferate industry - academia partnerships to drive outcomes

ICAR, through World Bank supported NAHEP project, has recently undertaken Resilient Agricultural Education System (RAES) development initiative with lead implementing agency as ICAR-IASRI, to accelerate the achievement of key recommendations of the National Education Policy (NEP) 2020.

The pivotal idea underlying the RAES development initiative is to provide uninterrupted access to teaching-learning thereby minimizing losses in learning. This implies the enablement of an

agricultural higher education system that hosts the capability to operate seamlessly across multiple situations and contexts. This would

- Leveraging the positive power of technology and digital to facilitate blended and flipped learning scenarios
- Strengthening collaborative partnerships with industry and government partners to embed a more "market driven" teaching-learning culture

ICAR has envisioned a three-component approach for implementing RAES under NAHEP Project. Three key components of RAES are:

### Digital Infrastructure

Infrastructure that enables digital agility to respond to changing needs of the education system

- Krishi Megh (ICAR-DC & DRC)
- Blended Learning Platform
- Unified Agricultural Higher Education Portal
- Virtual Classrooms
- Educational Mobile Applications
- e-governance Applications
- AR/VR Applications Experience Centers
- Academic Management System (AMS)

### Digital Content

Digital, engaging learning content that complements / supplements teaching-learning

- Creation of content based on UG, PG, Ph.D. syllabi
- Curation of content from global universities,
- Organizations
- Revising existing contents
- Web and mobile based applications for open
- Content creation and dissemination
- Augmented Reality/ Virtual Reality Contents

### Digital Capacity Building

Knowledge that facilitates access to and use of digital resources and infrastructure by:

- Addressing "digital divide" among students and teachers
- Identifying focus areas to foster teaching learning equity
- Studying global best practices
- Develop frameworks, capacity building plans

The first component entails Digital Infrastructure strengthening through a unified digital learning platform with distributed cloud architecture and multi tenancy enabling centralized design by ICAR and decentralized implementation by member Agricultural Universities. The second component is the development of a discipline-specific Digital Content Repository comprising of curated or created self-learning and instructional videos in various formats, and assessments & other immersive

learning content, aligned to the academic requirements of meeting undergraduate, postgraduate and doctoral learning outcomes. The third component is a system-wide Digital Capacity Building Program that entails generalized as well as differential learning courses, allowing end users to improve their digital competence, knowledge and skills to utilize the Digital Infrastructure and Digital Content Repository effectively, and transact securely & ethically in a digital learning environment.

RAES has the potential to benefit the entire agricultural higher education system stakeholders in India; many of whom belong to socio-economically weaker and marginalized sections of the society.

## Road to Resilience – Critical Drivers of RAES

"When learning is purposeful, creativity blossoms. When creativity blossoms, thinking emanates.

When thinking emanates, knowledge is fully lit. When knowledge is lit, economy flourishes."

-- Dr. APJ Abdul Kalam (Former President of India)

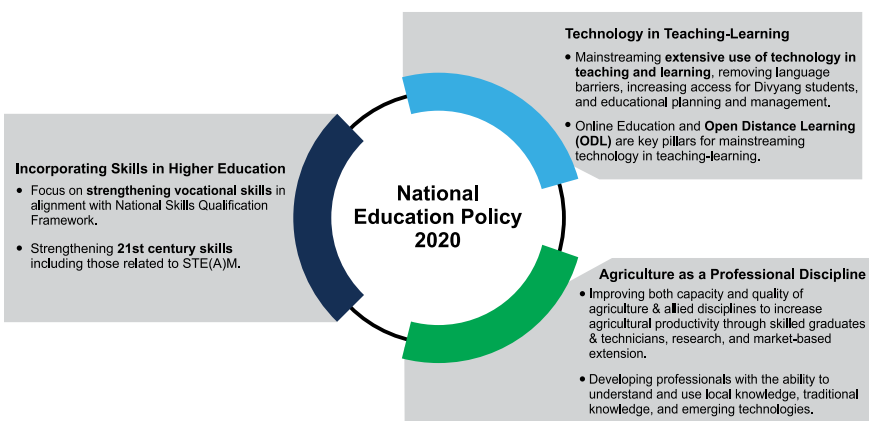
India has nurtured an enabling policy environment through the NEP 2020 and Digital India. Additionally, the NAHEP has been instrumental in strengthening agricultural higher education outcomes. Coupled with growing e-readiness across Indian Agricultural Universities, RAES initiative could not have come at a better time.

### a) National Education Policy (NEP) 2020

Agricultural Higher Education has the potential to significantly contribute towards sustainable livelihoods and economic development of India. Given 21st Century requirements and post COVID environment, blended education ecosystem has become the key focus of National Education Policy of Government of India.

### b) National Agricultural Higher Education Project (NAHEP)

The project development objective of NAHEP is to provide more relevant and quality higher education to agricultural university students across India.



NAHEP funded by the World Bank & implemented by ICAR, promotes higher standards of teaching and research through financing of improvements in infrastructure and faculty competency of the participating agricultural universities through Institutional Development Plans (IDPs), Innovation Grants (IG) to participating AUs, and establishment of Centers for Advanced Agricultural Sciences and Technology (CAAST).

NAHEP supports expanding the use of ICT and new media technologies including enhancing the Digital infrastructure at ICAR as well as associated agricultural universities through improving mobile applications, and developing union catalogue, digital repository and digital libraries.

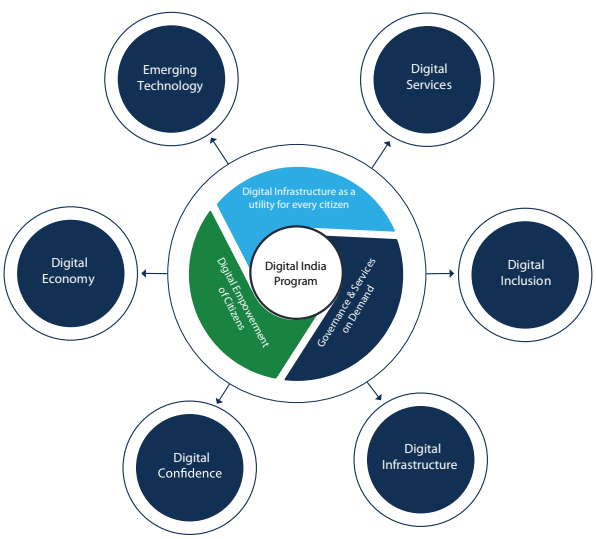
NAHEP has also supported multiple web digital applications for collecting and regularly updating real-time information about Agricultural Universities (AU's), constituent colleges, academic programs, faculty, students, financial, physical, and other resources, program-wise passing out graduates and their employment placement.

### c) Digital India 2.0

Digital India is an ambitious program of Government of India with an approximate investment of INR 1,13,000 crores. The program is envisioned with an aim to prepare

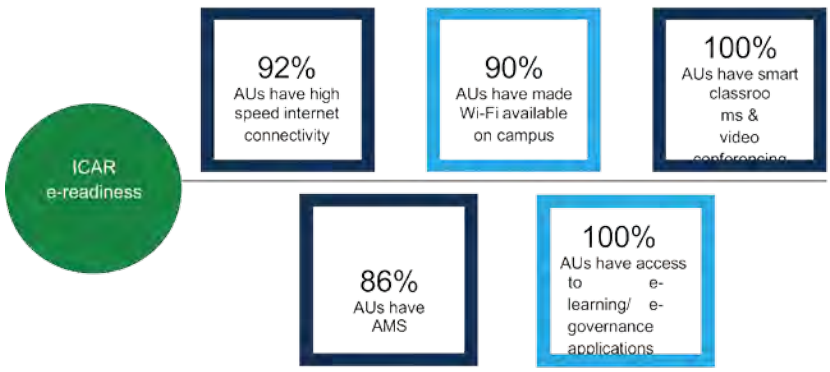
### d) Enhanced e-readiness status of ICAR and Associated Universities

ICAR and associated Agricultural Universities are in advanced state of e-readiness to implement a state-of-the-art ecosystem like RAES. A detailed e-readiness assessment provided the status of e-readiness across AUs in India.



## Achieving RAES – Strategic Themes & Way Forward

*"I envision better teaching methods and new education technologies that will revolutionize the classroom and encourage lifelong learning."*




--**Bill Gates (Philanthropist & Co-Founder, Microsoft Corporation)**

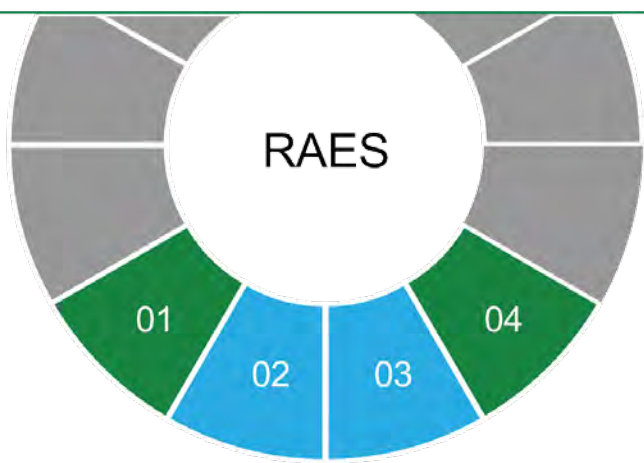
The success of the RAES development initiative would be determined through the achievement of the following:

### Strengthen Existing IT Infrastructure

Improvements across current suite of IT infrastructure and systems – Data Centers, Virtual Classrooms, e-content facilities etc. – to support a robust Learning Management System (LMS). Assist AUs in provisioning for last mile connectivity.

### Develop New IT Infrastructure

Develop and deploy robust Learning Management System integrated with existing infrastructure offering.



## Develop Digital Content Repository

Develop a repository of high-quality, curriculum aligned, pedagogically sound digital content of agriculture e-courses.

## Strengthen System-Wide Digital Capacity

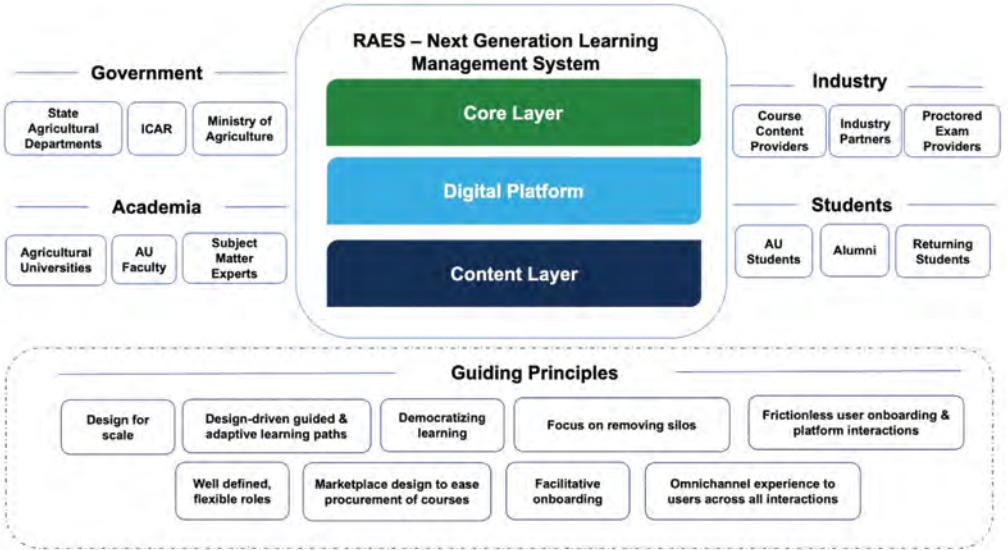
Provide intensive capacity building across stakeholder groups to access and utilize new and existing digital offering, effectively and efficiently.

The most critical piece that would tie together the RAES development initiative is the development and deployment of a "Next-Generation Learning Management System". This system would enable all stakeholders – students, faculty, and administration – to engage in effective teaching, learning and monitoring in order to drive better agricultural higher education outcomes. The platform would be designed to bring the larger vision of digital backbone for learning to life and be an evolving and scalable.

*"The most important principle for designing lively eLearning is to see eLearning design not as information design but as designing an experience."*

- **Cathy Moore (Training Designer)**

The digital platform would be built on a multi-layered architecture with decoupled modules which support interactions and emit data in real time. The organization and core layers of the next generation learning platform are provided below:



# Transforming Agriculture for Better Tomorrow: ICAR's First International Conference on "Blended Learning Ecosystem for Higher Education in Agriculture"

**Author- IASRI**

Agriculture is one of the mainstays of the Indian economy due to its significant role in rural livelihood, employment, and national food security. To realize India's aspirations of becoming a 5 trillion-dollar economy by 2025, there is an utmost need for a digital agricultural higher education system in India to evolve in sync with the fast-changing international scenario. The past decade has witnessed multiple global disturbances and in particular COVID-19 pandemic, which have thrown new challenges in ensuring the continuity of education in basic and higher education institutions across the world. This has motivated higher agricultural education institutions to adopt newer methods more easily for teaching & learning and leverage the power of digital technologies for better quality delivery of education.

In the post pandemic world, the education sector has undergone massive transformation with digital tools and technologies becoming the mainstay of new educational ecosystems. Educationalists across the world have been exploring alternative modes of quality education blended with traditional and in-person modes of education. Digital transformation is altering how we learn, enabling innovative distribution of education across time and space.

"Blended Learning" is one such approach that allows the teacher and students to rethink and transform the teaching & learning experience. Blended learning integrates computer-assisted online activities with traditional face-to-face teaching (chalk-and-talk).

To ensure the transformation of education system with resilient and sustainable operations, use of digital tools and technologies by higher education institutions is a must. It requires immersive technology and innovative new media tools, development of state-of-the-art blended learning platforms for holistic management of higher education, development of open-standard technologies, and making educational resources available to teachers and students. These are in alignment with the recommendations of UNESCO's International Commission on Futures of Education report "Education in a post-COVID world: Nine ideas for public action". The set of actions above are some of the interventions recommended for developing "Blended Learning Ecosystem".

Fortunately, the technologies available today can be innovatively applied to achieve much needed cyber-physical integration in education systems. In this context, the International Conference on Blended Learning Ecosystem for Higher Education in Agriculture is conceived.

The conference has been envisaged as a multi-partner global event to facilitate knowledge sharing, collaboration, and partnerships for the development of a state-of-the-art blended learning ecosystem for higher agricultural education in India. The learnings from this conference would enable ICAR to develop a strategy for accelerating the implementation and adaptation of a blended learning ecosystem. The conference is being hosted jointly by ICAR and the World Bank under NAHEP and is organized by ICAR - Indian Agricultural Statistics Research Institute, New Delhi from 21-23 March 2023.

ICAR has undertaken a recent initiative to develop and deploy a Blended Learning Platform envisioned as a "Next – Generation Learning Management System" allowing all stakeholders in agricultural higher education to engage in effective teaching, learning and monitoring. The platform would be designed to bring to life the larger vision of "strengthening the digital backbone of agricultural higher education institutes", to enable evolutionary, scalable and sustainable learning.

## Blended Learning

The use of blended learning is expanding globally and is evident in professional development training and general classroom offerings for a number of educational programs across disciplines in global communities. Blended learning is a combination of offline (face-to-face, traditional learning) and online learning in a way that the one complements the other. This style of learning provides a way for faculty to engage students through visuals and online interaction. This approach ensures that the learner is engaged and in greater control of his or her individual learning experience.

## Objectives

1. To deliberate on strategies to operationalize a blended learning ecosystem for agricultural higher education
2. To deliberate upon the sustainability of the blended learning ecosystem through promoting private public partnership in alignment with market need and demand
3. To deliberate among stakeholders to formulate a mechanism for the continuous improvement of cross-sectorial integration of the blended learning ecosystem

## Conference Themes and Sub Themes

In alignment with the core purpose of the conference to identify the best strategies in blended teaching-learning, it would be organized into a few thematic areas. These areas would primarily focus on the key aspects of operationalizing RAES – technology for education delivery, e-Learning content, partnerships for sustainability and system-wide capacity building. The themes are contemporary and relevant, and the outcome of discussions would be to identify the best possible models for each given the context of agricultural higher education. To this end, the discussions would draw upon learning from global leading practices, current global dialogues, stakeholder perceptions and empirical evidence of efficacy. The Conference would be guided by five thematic areas for which a special symposium would be organized. In the table below, each of the thematic areas have been described and key questions of exploration articulated.

## Thematic Areas

- Strategies for blended teaching-learning
- Technologies for blended ecosystem
- Sustainability in blended learning ecosystem
- Building stakeholder capacities to navigate in a blended teaching-learning ecosystem
- Contemporary curriculum for agricultural education

### 1. Strategies for Blended Teaching-Learning

- Blended learning for higher education in the post pandemic era in the context of National Education Policy (NEP) 2020
- Designing effective assessments for online learning environments
- Professional development and support for online faculty: challenges and opportunities
- The role of emerging technologies in creating immersive learning experiences

### 2. Technologies for Blended Learning

- Integrating technology and education: to diversify online learning and teaching
- Technology considerations to build platforms at scale and cater for different user needs
- Free open-source tools and technologies to be leveraged
- Learning analytics: tools and possibilities
- Developing, designing and implementing augmented reality within learning environments: reflection and ethical considerations for its implementation
- Game based approach for teaching to ignite student interest and drive outcomes in a collaborative environment

### 3. Sustainability in the Blended Learning Ecosystem

- Developing sustainable teaching and learning environments
- Faculty and instructional designers: learning about successful collaborations from other professions
- Creating an effective e-Learning culture: the pedagogical variations for online learning and teaching
- Addressing security and privacy issues and concerns about the use of digital platforms for students
- Systems thinking in a marketplace design
- Role of blended learning environments in peer-to-peer learning

### 4. Building Stakeholder Capacities to Navigate in a Blended Teaching-Learning Ecosystem

- Building optimal capacities for implementing blended learning on college campuses
- Networked and self-directed approaches to professional development in online teaching and design
- Easy to use e-content development tools and methods for higher education faculties
- Leading change for effective faculty development programs

**5. Contemporary Curriculum for Agricultural Education**

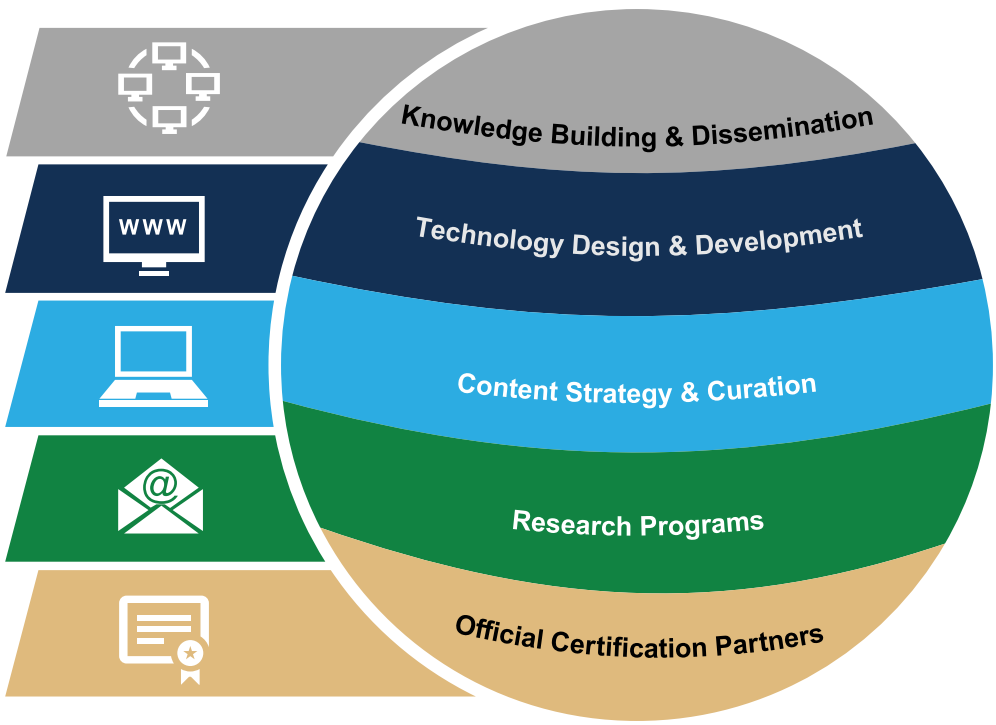
- Curriculum and pedagogical changes for a blended-learning environment
- Faculty preferences while creating courses for the online environment
- Designing effective courses online: effective pedagogy for online courses for college faculty

**Unique Partnership Forum**

The conference would provide a unique partnership forum to collaborate on the leading practices in digital infrastructure, digital content and digital capacity building among government, private and non-profit organizations

*"Universities have come to realize that online is not a fad. The question is not whether to engage in this area but how to do it."*

**- Daphne Koller (Co-Founder, Coursera)**




**Conference Components:**

- Keynote Lectures
- Technical Sessions
- Panel Discussions
- Case Studies
- Partnership Forum
- Special Event
- Exhibition

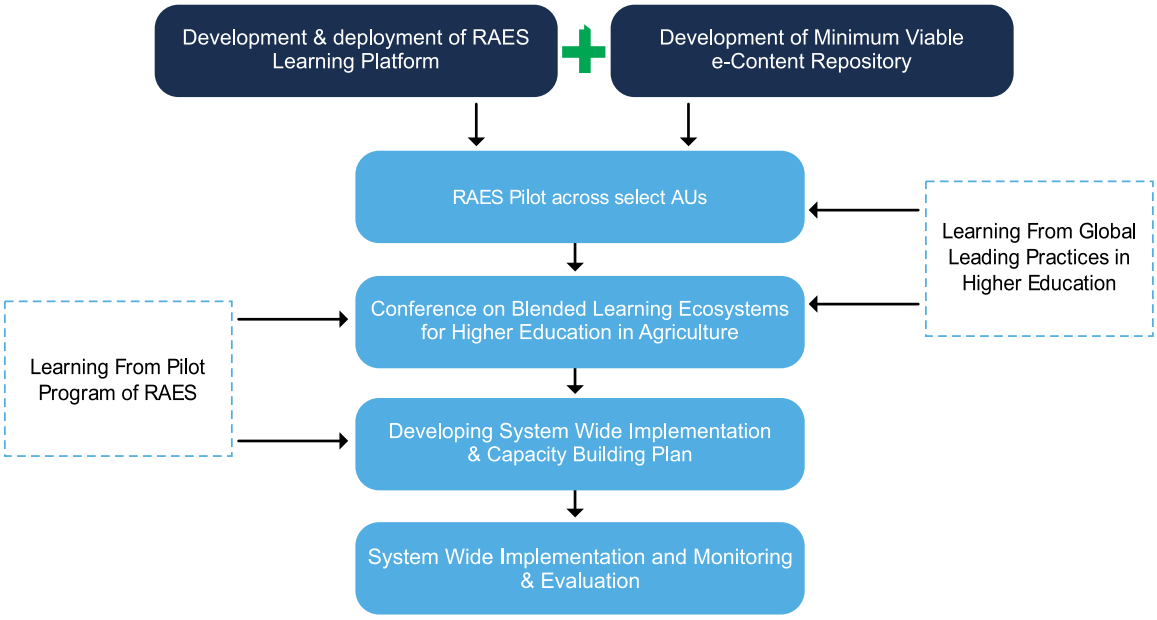
**Expected Outcomes:**

- Partnerships
- Knowledge Sharing
- MoUs
- Oversight Mechanism

**Way Forward**

The RAES development initiative has been conceptualized as a multi-year project that would leverage the innovation potential of Industry 4.0 technologies and "platform-based approach" to transform education delivery across Agricultural Universities (AUs) in India. The initiative would take a phased approach to achieve the intended success factors of RAES.

The aim of this conference is to facilitate the development of a global ecosystem of partners from academia, industry, government, and multilateral & bilateral organizations who would provide critical insights towards design & full-scale implementation of all aspects of RAES i.e learning management system, content repository, and system-wide capacity building.



# ABSTRACTS OF KEYNOTES

PLENARY SESSION 1

## Modernization of Agricultural Education

Co-Chairs

**Dr. R C Agrawal**
DDG (Agricultural Education) & National Director, NAHEP, ICAR, New Delhi

**Dr. Anupama Singh**
Joint Director, ICAR – Indian Agricultural Research Institute, New Delhi

Convener

**Dr. Seema Jaggi**
Assistant Director General (HRD), ICAR, New Delhi

Rapporteurs

**Dr. Soumen Pal**
Senior Scientist, ICAR – IASRI, New Delhi

**Dr. Chandan Kumar Deb**
Scientist, ICAR – IASRI, New Delhi

# KEYNOTE SPEAKERS

**Keynote Title: Modernization of Agricultural Higher Education in India & The Roadmap for Implementation of New Education Policy 2020**

**Dr. R C Agrawal**
DDG (Agricultural Education) & ND, NAHEP

**Keynote Title: Blended Learning - New Opportunities for Higher Agriculture Education in India**

**Mr. Bekzod Shamsiev**
Task Team Leader (TTL), NAHEP, The World Bank, Washington, USA

**Keynote Title: Drawing from Global Experiences of Higher Agriculture Education and Innovation on Agriculture and Agribusiness Development**

**Mr. Werner Wutscher**
Former Secretary General, Federal Ministry for Agriculture, Environment, Forestry, and Water Management, Austria

**Keynote Title: Steering Tertiary Education Toward Resilient Systems that Deliver for All**

**Mr. Denis Nikolaev**
Senior Education Specialist, World Bank

# KEYNOTES

**Dr. R.C. Agrawal**
DDG (Agricultural Education) & National Director, NAHEP,
Indian Council of Agricultural Research, New Delhi, India.

Dr. Rakesh Chandra Agrawal is the Deputy Director General of the Indian Council of Agricultural Research (ICAR). Being the National Director, National Agricultural Higher Education Project (NAHEP), ICAR, he is entrusted with the responsibility of developing resources and mechanism for supporting infrastructure, faculty, and student advancement, and providing means for better governance and management of agricultural universities.

Dr. Agrawal is also the National Convener for the development of Roadmap for the implementation of the National Education Policy-2020 in Agriculture Education.

Dr. Agrawal is a fellow of National Academy of Agricultural Sciences. The FAO elected Dr. Agrawal in 2018 to head a Technical Experts Group on Farmers Rights for its implementation in 146 countries. He is presently the Vice-Chair of the Asia Region of the Bureau of International Treaty of Plant Genetic Resources for Food and Agriculture. He has represented the country as part of Indian delegation to more than 20 countries.

He has published more than 40 research papers, authored 4 books and delivered about 200 invited talks. He has also executed 10 research projects funded by International and National Agencies.

**Keynote Title: Modernization of Agricultural Higher Education in India & the Roadmap for Implementation of New Education Policy 2020**

Agriculture plays a vital role in India's economy. 54.6% of the population is engaged in agriculture and allied activities (census 2011) and it contributes 17.4% to the country's Gross Value Added (current price 2014-15, 2011-12 series). In last decade, India has become the largest producer of pulses, milk, and other commodities. Indian Agricultural education system has produced various World food laureates who have changed the face of Indian agriculture across the globe by their revolutionising discoveries and research in agriculture.

The Department of Agriculture, Cooperation & Farmers Welfare (DAC & FW) is one of the three constituent Departments of the Ministry of Agriculture & Farmers Welfare, the other two

being Department of Animal Husbandry, Dairying & Fisheries (DAHD & F) and Department of Agricultural Research and Education (DARE). DARE constitutes of Indian Council of Agricultural Research (ICAR) which is an apex body for co-ordinating, guiding, and managing research and education in agriculture including horticulture, fisheries and animal sciences in the entire country. There are 75 Agricultural universities in India with various disciplines to offer such as food technology, horticulture dairy technology and so on. To attract talented students, ICAR provides various national and international scholarship schemes.

ICAR and World Bank are jointly implementing National Agricultural Higher Education Project which is transforming agricultural higher education project through various digital and strategic initiatives such as establishing more than 900 experimental learning centres, incubation centres, establishing smart classrooms in all agricultural universities and help students in setting start-ups. This project is also helping agricultural universities to move towards global ranking and compete with global agricultural universities.

National Education Policy 2020 was released by Government of India in 2020 with a vision to transform India's education system by 2030. This policy aims to provide high quality education to all and develop deep sense of belongingness for the country. NEP 2020 proposed technology interventions in online/digital education, online assessments and examinations and teacher recruitment and deployment.

With NAHEP and NEP 2020, Agricultural higher education is going through a paradigm shift and by 2030 - 2040 all institutions will start offering either professional or general education to organically evolve into multi-disciplinary institutions/clusters offering both seamlessly, and in an integrated manner. The entire policy will be in an operational mode, following which another comprehensive review will be undertaken.

**Mr. Bekzod Shamsiev**
Task Team Leader (TTL), NAHEP,
The World Bank, Washington, USA

Bekzod Shamsiev is a dynamic program administrator and professional economist with 20 years of international experience. A well-rounded development professional. His major strengths include public policy dialogue and proactive management of investment projects in multicultural settings. Recognized for strong client orientation and the ability to develop and implement innovative and multi-disciplinary solutions to complex technical issues.

**Keynote Title: Blended Learning - New Opportunities for Higher Agriculture Education in India**

The COVID-19 pandemic has spurred an unprecedented burst of innovation and rapid adoption of digital technologies to allow education to continue while people cannot meet in person. During the pandemic the immediate focus for ICAR, NAHEP and the Agricultural Universities was therefore on solutions that could be developed and implemented for the 2020-21 academic year, with the aim of making quality education available as far as possible to all students in all disciplines.

As well as being of direct use during this and future pandemics, digital solutions developed during the pandemic have long-term applications in at least two ways:

To support campus-based education where these technologies make education more effective or efficient;

To extend and improve distance learning to educate more people at affordable cost.

Global and national developments in information and communications technology (ICT) bring a continuous stream of new possibilities, which the Indian government has embraced through initiatives such as the programme to bring fibre broadband to every village in the country and the establishment of "Common Service Centres" and "Smart Poles".

Developments in education, including the massive school sector and learner-driven adult education, are creating new tools and platforms that can be quickly adopted for agricultural higher education. Given the substantial investment of time and resources needed to get the best out of any new software, there is a strong case for ICAR to promote a limited number of industry-standard packages and to support staff and students to become proficient in their use.

**Mr. Werner Wutscher**
Former Secretary General, Federal Ministry for Agriculture, Environment, Forestry, and Water Management, Austria

Werner Wutscher is an entrepreneur with broad leadership experience in the private sector as well as in public administration in Austria and abroad. In his prior functions, he was secretary general of the Federal Ministry for Agriculture, Environment, Forestry, and Water Management as well as COO of REWE International AG. In 2013, Werner Wutscher founded his own company, New Venture Scouting St. Paul GmbH, and since then has been mainly involved in building an agile startup ecosystem in Austria. With his broad experience, he bridges the private sector and public administration as well as institutions for research and innovation and non-profits.

**Keynote Title: Drawing from Global Experiences of Higher Agriculture Education and Innovation on Agriculture and Agribusiness Development**

New Venture Scouting (NVS) was founded in 2013 by Werner Wutscher as a private consulting firm, bridging the worlds of traditional companies and start-ups. The company has strong expertise in the development, management, and evaluation of start-up-friendly ecosystems. A specific focus lies on the design and implementation of accelerator programs for academic founders (spinoff programs). In this context, NVS works with multiple universities in Austria and abroad. During his career, Werner Wutscher served seven years as Secretary General in the Austrian Federal Ministry of Agriculture and Environment and four years as a COO in European food retail. Since 2018, he has been the elected president of the university council of Alpen-Adria-University Klagenfurt.

Transformation is an ongoing requirement in today's society and especially in agriculture. Farmers and agribusinesses have to adapt to rapidly evolving challenges and opportunities arising from global trends such as digitalization and climate change. On the one hand, digitalization offers new ways of collecting, analyzing, and sharing data that can improve productivity, efficiency, and sustainability. On the other hand, climate change pose serious threats to food security and natural resources. Additionally, the agriculture sector is highly fragmented in many aspects. It involves a broad diversity of products, from crops and livestock to fruits and vegetables. Even more complicated, agriculture is geographically dispersed across different regions, each with its own climate, soil, and water conditions. Depending on the political region, the sector is subject to varying environmental policies and regulations affecting practices and achievable impacts. All these lead to fragmented value chains consisting of multiple stages and actors, from input providers and farmers to traders and consumers. These factors create challenges for coordination, communication, and collaboration within the agriculture sector.

To cope with these challenges, the agriculture industry needs to learn from the diverse experiences of higher agriculture education and innovation around the world.

The author emphasizes three main strategies to respond to these challenges:

1. Speeding up and using new ways of nonlinear thinking to create new solutions: The model comes from the startup world. Instead of time-consuming planning and business modeling, startups come up with new ideas, quickly test them on the market via Minimum Viable Products (MVP) or prototypes, and respond to customer feedback within days and weeks.
2. Creating innovation ecosystems across traditional value chains: Here it is key to find new ways of collaborating among different players in the industry and even outside the boundaries of traditional agriculture. The transformation of the business world towards digital platforms support this trend.

An innovation ecosystem is defined by a joint structure of partners through which they interact to deliver a value proposition to end customers (Adner, 2021). It is constructed around a common goal and value proposition of multilateral partners working together in a clear but flexible arrangement. In this setting, a multi-stakeholder approach is necessary where representatives of agriculture, the business world, politics and administration, the civil society, as well as educational institutions such as universities, work together.

There is a widespread misunderstanding that innovation is only driven by technology. But this belief is outdated: Successful ecosystems stand out in their capacity to create social innovation among partners!

**Mr. Denis Nikolaev**
Senior Education Specialist, World Bank

Denis Nikolaev joined World Bank in ECA region in 2008. Since then, he worked in different World Bank projects, mainly in higher education area, in Armenia, Belarus, Bulgaria, Kazakhstan, Moldova, Romania, Russia, Tajikistan and Uzbekistan. Since 2022 he joined WB SAR Education team as a Senior Education Specialist and is based in Delhi. He started his career as a higher education specialist at the regional Ministry of Education in one of the Russian regions, then worked as a head of the corporate university in a big industrial company in Russia and as an instructor in a few universities. His research interests are tertiary education and in particular: quality assurance, regional higher education systems, internationalization, strategic planning and relevance to the labor market. Mr. Nikolaev holds an MA degree in Education Management from Manchester University (UK).

**Keynote Title : Steering Tertiary Education Toward Resilient Systems that Deliver for All**

This talk covers main components of the World Bank policy framework on tertiary education, which seeks to (i) reinforce the imperative that every country — regardless of level of development — invest thoughtfully and strategically in diversified and well-articulated tertiary education systems; (ii) provide a framework for policymakers and other tertiary education stakeholders to examine critical traits responding to the needs for advanced skills and lifelong learning in support of growth and development and key interventions for tertiary education systems in the decades ahead; (iii) examine the impact of the COVID-19 pandemic on the global tertiary education sector and share ideas that promote a resilient recovery from the crisis; and (iv) offer information about the content, context, and scale of the World Bank's operational and analytical work in tertiary education.

The guiding principle of this policy approach paper is that policymakers and academic leaders must be purposeful in steering their tertiary sectors toward the national and institutional strategic goals. To achieve these goals, the World Bank has identified five key dimensions that are instrumental for creating agile, effective, and sustainable tertiary education, particularly in the post-COVID environment.

Within this steering framework and with a view to turning the challenges wrought by the COVID-19 crisis into opportunities for impactful reforms, this paper encourages tertiary education policymakers and stakeholders to STEER their tertiary systems and institutions, utilizing:

- Strategically diversified systems — supporting all postsecondary institutions, ensuring agile, articulated pathways and diversity of forms, functions, and missions, developing future-

oriented strategies and positioning tertiary education in a lifelong learning context with flexible pathways;

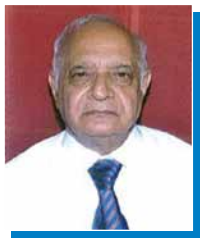
- Technology — designed and applied in a purposeful and equitable manner, harnessing the power of technology to improve teaching and research capacity and building a digital ecosystem with the help of National Research and Education Networks (NRENs);
- Equity — a universal approach to the benefits and opportunities of postsecondary learning, acting to ensure that equity and inclusion in access and success are mandatory;
- Efficiency — a goal-oriented, effective use of resources Improving information systems and devising and deploying governance, financing, and quality assurance instruments;
- Resilience — the ability to persist, flourish, and deliver agreed goals despite adversity, acknowledging the need for resilience planning and utilizing adaptive governance frameworks.

These five aspects present critical building blocks with which tertiary education leaders and institutions can reframe and strengthen their systems for greater impact on learning, growth, innovation, and social development.

PLENARY SESSION 2

## Blended Learning Through the Lens of Emerging Technologies

Co-Chairs



**Dr. P L Gautam**
Former Vice Chancellor, GBPUAT, Pantnagar

**Dr. Tilak Raj Sharma**
DDG (Crop Science), Division of Crop Science, ICAR

Convener

**Dr. Hema Tripathi**
National Coordinator (M&E and ESS), PIU, NAHEP, ICAR

Rapporteurs

**Dr. Sanchita Naha**
Scientist, ICAR – IASRI, New Delhi

**Ms. Madhu**
Scientist, ICAR – IASRI, New Delhi

# KEYNOTE SPEAKERS

**Keynote Title: NAHEP – Blended Learning Platform and Associated IT Initiatives**

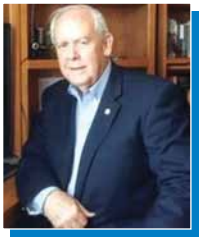
**Dr. Sudeep Marwaha**
Principal Investigator, NAHEP Component 2, ICAR – IASRI,
New Delhi

**Keynote Title: Flipped Classroom Model for Self-paced Learning in Veterinary Education**

**Dr. Surinder Singh Chauhan**
Senior Lecturer Animal Science, School of Agriculture and Food, Dookie Campus, Dookie College, Victoria 3647, The University of Melbourne, Australia

**Keynote Title: Integrating Innovation and Entrepreneurship in Agricultural Education**

**Prof. Perry Den Brok**
Professor, Department of Social Sciences, Wageningen University, Netherlands



**Keynote Title: Blended Learning and Emerging Artificial Intelligence Technologies**

**Dr. Glen C. Shinn**
Professor Emeritus, Department of Agricultural Leadership, Education and Communications Texas A&M University, USA

**Keynote Title: How Virtual reality is Changing Education and Research**

**Mr. Harshavardhana Kikkeri**
Chief Executive Officer and Chief Technology Officer, Holosuit – Holoworld, India

**Dr. Sudeep Marwaha**
Principal Investigator (PI), NAHEP–RAES, ICAR – IASRI, New Delhi, India

Dr. Sudeep Marwaha is working as Principal Scientist at ICAR-Indian Agricultural Statistics Research Institute (IASRI), Pusa, New Delhi. He is the PI of the NAHEP Component 2 projects viz. "Investment in ICAR Leadership in Agriculture Higher Education" and "Resilient Agriculture Education System". Numerous IT initiatives have been undertaken in these projects to improve Higher Agriculture Education System in India. Some of the successful systems are Academic Management System for Agriculture Universities, Education Portal, E-Learning Portal, Agriculture Universities Ranking System, Accreditation Portal, KVC-ALNET, Agriculture Experts Information System, Kritagya Online Hackathon Management System, Clean Green Campus Awards, AGRI DIKSHA and Virtual Classroom Network, AR/VR Experience Labs and Modules, Capacity Building Portal, KISAAN 2.0 Mobile App, Educational Mobile Apps in the fields of Animal Sciences, Artificial Intelligence based Disease Identification for Crops, etc. He has developed/implemented many e-governance systems of national importance which are used by students, scientists and farmers across the country. Some of these systems include ICAR-ERP, e-Office for all ICAR institutes, ASRB-OASIS, NASS-NFOSIS, ICAR-FVMS, ICAR-PMS etc. He has been involved in establishment and management of Krishi Megh which includes ICAR Data Centre and ICAR Disaster Recovery Centre. He joined ICAR in 1999 as scientist and served at various positions including Professor (Discipline of Computer Applications) and Head of Division of Computer Applications. He has over 23 years of experience in post graduate teaching, training and research. He is faculty member of Computer Applications and Bioinformatics and has guided over 14 M.Sc. and 5 Ph.D. students. He has presented/ published over 100 papers in national/ international conferences/journals. Prior to that, he has completed his post graduate in Computer Science from IARI, New Delhi and Ph.D. in Computer Science from University of Delhi. His research interests include development of intelligent systems, recommender systems, management information systems, Artificial Intelligence based systems, application of image analysis for estimating plant pigments etc.

**Keynote Title: National Agricultural Research and Education System-Blended Learning Platform (NARES-BLP)**

To ensure the transformation of the education system with resilient and sustainable operations, it is integral to combine in-classroom experiences with the flexibility of virtual learning. NARES-BLP has been developed in light of achieving this and more. Designed and developed under NAHEP-RAES, National Agricultural Research and Education System-Blended Learning Platform (NARES-BLP) aims to revolutionize higher agricultural education. With its integrated set of interactive online

services, NARES-BLP provides faculty, learners, and others involved in education with information, tools, and resources to support and enhance educational delivery and management.

Through its unique features including in-built video conferencing, whiteboard, & AR/VR studio, the ability to support high user concurrency, 24*7 easy access to content, proctored assessment, continuous evaluation and universal compatibility with Windows/MacOS/Android/iOS, NARES-BLP is innovating agricultural education by providing next-generation learning solutions. Transitioning from traditional classroom teaching pedagogy, NARES-BLP is set to transform information assimilation through gamified learning to maximize retention and engagement.

The Agricultural Sector plays a pivotal role in driving India's economy, serving as the primary contributor to the nation's GDP. Given the sector's paramount significance, it is upon us to take proactive measures to empower the next generation to meet the challenges of the future. The key lies in equipping our young minds with the necessary knowledge and competencies by addressing the widening learning gap given the lack of modern-day technology and infrastructure in agriculture education. NARES- Blended Learning Platform equips universities, students, and others to overcome technological constraints, fosters flexible Agricultural Education and creates avenues for the youth to access the latest technologies, resources and training, even in remote and difficult areas. It not only provides new models for education but boosts knowledge retention for learners. This transformative platform enables an enhanced learning experience and guarantees the long-term sustainability and triumphs of India's agricultural industry. The NARES-BLP along with the other important innovative solutions like AGRIDIKSHA, Ag. University Academic Management System (AU AMS), Krishi Vishvavidyalay Chattar – Alumni Network (KVC-ALNET) and Agriculture Experts Information System (AEIS) are designed to boost the digital technologies across all AUs, bringing a much needed inclusive digital growth for overall transformation in agriculture for the New India.

**Dr. Surinder Singh Chauhan**
Senior Lecturer Animal Science, School of Agriculture and Food, Dookie Campus, Dookie College, Victoria 3647, The University of Melbourne, Australia

Dr. Surinder Singh Chauhan is the Director International, School of Agriculture and Food, and the Deputy Director of Melbourne India Postgraduate Academy (MIPA), The University of Melbourne. Dr. Chauhan has more than 15 years track record of research and teaching in veterinary and animal sciences in three countries including Australia, India, and USA. Before moving to Australia, Dr. Chauhan served the State of Himachal Pradesh, India, for 20 years as Veterinary Officer. Dr. Chauhan moved to Australia in the year 2011 following his selection for AusAID Australian Leadership Award and completed his PhD from The University of Melbourne in 2014. Following his PhD, Dr. Chauhan provided his services as Senior Veterinary Officer in the State of Himachal Pradesh, India. Later Dr. Chauhan completed his Post doctorate in Animal and Meat Science at The Ohio State University, USA.

Currently at The University of Melbourne, Dr. Chauhan is leading the Australia India Collaboration for Sustainable Livestock Production funded by the Australian Government DFAT Australia-India Council. Dr. Chauhan is also the recipient of UOM India Engagement Seed Grant 2020 and has been collaborating with ICAR institutes and Indian Agricultural Universities, to promote sustainable intensification of integrated crop-livestock systems for improving smallholder livelihoods. He is very keen to utilise Remote Sensing, Artificial Intelligence and Machine Learning to predict the impact of climate change and heatwaves on animals to improve their welfare and meat quality. He has received about $5 Million research grants to support his research work that includes several industry projects. Dr. Chauhan has published more than 100 refereed research papers and have presented his research at various national and international conferences in different countries (Australia, China, Denmark, India, and USA), including 7 keynote papers. Currently at The University of Melbourne, he is teaching 3 subjects in agricultural and veterinary sciences and supervising 6 PhD students.

**Keynote Title: Flipped Classroom Model for Self-paced Learning in Veterinary Education**

Recent research on teaching and learning in tertiary education has demonstrated that adopting innovative teaching approaches and engaging students more actively than traditional lecture-based approaches results in improved learning outcomes. Flipped classroom is one of the active teaching approaches that can be successfully used to enhance the student learning outcomes. Flipped classroom teaching is a specific variety of blended instruction in which traditionally in-class activities (especially lectures) are done as homework, while traditional homework activities (like working through practice exercises) are done in class. This teaching approach engages students' pre-class to learn foundational knowledge and skills, then undertake learning activities in class which require them to integrate, apply

and extend their knowledge and skills. The use of online technologies such as videos and podcasts have become synonymous with the term flipped classroom in recent years. However, this teaching method is not entirely new as good teachers have been using a flipped classroom technique for hundreds of years, with preparatory activities involving reading textbook chapters, printed journal articles or study notes before class. More recently, a typical flipped classroom approach of pre-recording lectures and posting the recordings to Canvas (LMS; learning management system) for students to watch before class, and then assisting students through assignments during class time, has become more common. Such an approach is designed to maximize the special power of the in-person classroom to facilitate social learning while moving content delivery like lecturing to out-of-class homework time, where students have the best opportunity to focus individually. In the developed countries, use of the flipped classroom technique is well established in education at all levels, including primary, secondary, and higher education. However, the use of Flipped classroom use in agricultural and veterinary education is less commonly reported in the literature. A recent multinational survey (Matthew et al., 2019, University of Tonto Press) on use of flipped classroom use in veterinary education reported that 95% of participants (USA, Canada, and Australia) were familiar with the flipped classroom technique, although fewer (64%) used it in their teaching. Most participants perceived that the flipped classroom technique benefited student learning, with some also identifying benefits for the faculty involved. A growing body of evidence suggests that flipped classroom approach could be used for engaging agricultural and veterinary students in active learning to enhance their learning experience and quality outcomes. The pre-class materials such as reviewing online and printed material, pre-recorded lectures and engaging in preparatory learning activities such as quizzes, case analyses, reflective assignments, and group activities can be considered for flipped classroom techniques in agricultural and veterinary education. Similarly, a variety of active learning strategies such as discussions, presentations, quizzes, group activities, problem solving, and laboratory/practical exercises can be adopted for in class teaching and learning. While this approach can be comparatively easily adopted by some countries, however, many countries are likely to face a range of student, faculty, and institution-related barriers to implementing the flipped classroom techniques. Therefore, teachers, university administration and governments in each country need to consider these barriers and work together to address the barriers and deliver blended education for better quality student learning outcomes in agricultural and veterinary education.

**Prof. Perry Den Brok**
Professor, Department of Social Sciences, Wageningen University, Netherlands

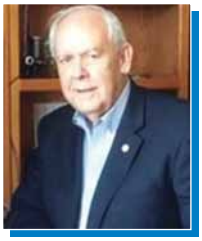
Perry den Brok is professor in Education and Learning Sciences at WUR and chair of the group with the same name (ELS). His research interests lie in the field of educational innovation, rich and innovative learning environments, teacher learning and profesional development. He also conducted quite some studies on teachers in secondary education, for example on topics such as classroom management. Recently, teaching with ICT (Information and Communication Technology) has become a topic of interest.

Perry is also chair of the 4TU Centre for Engineering Education, a centre that initiates, supports and studies course and curricular innovations at the four universities of technology in the Netherlands and disseminates insights to practitioners and policy makers and support staff at higher education institutes.

**Keynote Title** : **Integrating Innovation and Entrepreneurship in Agricultural Education**

Higher education, including agricultural education, is rapidly changing. Society needs graduates that are able to deal with the grand challenges and complex problems of our time, such as climate change, diseases and health, food safety, inequality and so on. In order to deal with these challenges, universities not only need to ensure that their programmes provide up- to-date and specific knowledge, but also that students are able to deal with real-life authentic problems, collaborate with experts from other disciplines and are trained in relevant competences or skills. With respect to skills, people also refer to the so-called Inner Development Goals (IDG's): understanding self, cognitive thinking skills, caring and relating, social skills and driving change. This focus also requires a broad view on entrepreneurship, e.g. stimulating an entrepreneurial mindset and developing entrepreneurial skills, such as perspective identification, dealing with uncertainty, creativity, networking, creating opportunity, taking initiative and so on. The keynote starts with a brief outline of this new focus on challenges and needed skills. Next, the keynote will highlight drivers for educational innovation in agricultural education. Next to the aforementioned societal need (1), other drivers relate to changes in the student population (2), an increasing role of IT in teaching/learning (3), changes in research and disciplines (4), and changes in missions and visions of universities themselves (5). The keynote uses the concept of educational ecosystem to discuss main innovation trends in higher (agricultural) education that are visible around the world. These trends concern structure of education – for example new learning outcomes, new assessment criteria, more open curricula – connections (e.g. co-creation and collaboration, inter- and transdisciplinary education, boundary crossing), values

and visions of universities (including flexibility, agency, sustainability, responsibility, emancipation), but also new teacher roles and pedagogies – active, experiential and metacognitive learning; teachers as coaches, assessors, IT supporters or networkers – and new spaces for education, such as authentic contexts, VR/AR, open classrooms and out-of-school learning. The keynote ends with some conclusions for blended learning and the use of emerging technologies. It is important that IT is used not only to stimulate efficiency, but to enrich and transform learning. IT can support flexibility of processes and learning paths, support transdisciplinary connections and hep to open learning spaces. Also, IT may be used to support safety and sustainability. At the same time, the disadvantages of IT or counteractive use also requires attention. This may include the over-focus on cognitive dimensions of learning on which much IT is focused, the need to support and train teachers, ethical and trustworthiness issues and so on.



**Dr. Glen C. Shinn**
Professor Emeritus, Department of Agricultural Leadership, Education and Communications Texas A&M University, USA (Virtually)

Shinn is Professor Emeritus and Borlaug Senior Scientist at Texas A&M University (USA). His academic focus is agricultural education, higher & adult education, and agricultural engineering. A year of a sabbatical study in 2005 examined international business models for rural agricultural education. In addition, Shinn has professional experience in 39 countries and led Texas A&M post-conflict development teams in Iraq and Afghanistan. Presently, Shinn is engaged in rural development, postsecondary agricultural education, curriculum integration, diffusion of innovation, and agricultural technologies encased in change.

**Keynote Title : Blended Learning and Emerging Artificial Intelligence (AI) Technologies**

During periods of global turbulence, pandemics, change, and uncertainty, it is essential to prepare students for their future rather than our past. In the past decade, we have increasingly recognized the need for self-directed learning focusing on durable knowledge, skills, and competence. This shift has moved higher education in agriculture, food, and natural resources toward lifelong learning, applied technologies, and meaningful, measurable outcomes. Blended learning is an intermediate step in a broad educational approach combining synchronous and asynchronous digital technologies and instructional approaches to facilitate the students' learning experiences. This paper reviews research-based principles of teaching and learning and the likely futures of the learner, teacher, and higher education.

Looking backward and forward is a process for reflecting on past practices and considering educational innovations. In the context of blended learning and emerging AI technologies, this process involves reviewing the current state of technology in education, considering the benefits and challenges of blended learning, and exploring the potential of rapidly emerging AI technologies to support student learning and teacher development.

**Mr. Harshavardhana Kikkeri**
Chief Executive Officer and Chief Technology Officer, Holosuit – Holoworld, India

Harshavardhana Kikkeri is the founder and CEO of HoloSuit Pte Ltd. He has invented and patented HoloSuit – which is a disruptive wearable technology which acts as Universal Simulator, Universal Manipulator and Universal Navigator.

He is a pioneer in Robotics and Artificial General Intelligence who talks have been featured on TedX. His specialty is in building co-working robots for Industry 4.0 which could mimic humans by just observation.

He had a rich experience at Microsoft Robotics on building Autonomous Robots, Motion Tracking, Drones, Navigation, Manipulation and Computer Vision. He headed Advanced Research at Suitable Tech on Telepresence Robots. He has developed 17 feet robot which was demonstrated at CES. His robot was used in Kaun Banega Crorepathi, TedX by Google CEO, President Obama and Prime Minister Modi. Worked extensively on Audio and Video Signal Processing and Compression at Microsoft Research.

When Hon Prime Minister Modi had visited Silicon Valley in 2016, he brought a quadriplegic person from 3500 miles away to the Santa Clara convention center using his telepresence robot. He shook hands with Hon PM Modi using His Suit controlled Hanuman Bot.

He has 45 patents in the field of Robotics, AI, Augmented Reality, Virtual Reality. He was awarded Gold Star by Microsoft, Bharat Petroleum Scholarship and both his companies won Govt. of Karnataka Elevate Startup Challenge in 2018 and 2019. Virtualize Skilling using HoloSuit Hire a Million, Skill a Billion.

**Keynote Title : How Virtual Reality is Changing Education and Research**

PLENARY SESSION 3

# Models and Studies on Blended Learning Ecosystem

Chair

**Dr. A K Singh**
Vice Chancellor, Rani Lakshmi Bai
Central Agricultural University, Jhansi

Convener

**Dr. Shanti Kumar Sharma**
ADG (Human Resource Management Unit), ICAR, Hyderabad

Rapporteurs

**Mr. Akshay Dheeraj**
Scientist, ICAR – IASRI, New Delhi

**Ms. Madhu**
Scientist, ICAR – IASRI, New Delhi

# KEYNOTE SPEAKERS

**Keynote Title: Change Leadership for Blended Learning in Higher Education: the Case of Malawi, the Warm Heart of Africa**

**Dr. Joshua Valeta**
Director, Open, Distance and e-Learning, Ministry of Education, Malawi Government, Malawi

**Keynote Title: Economic Returns to Agricultural Research and Development**

**Dr. Evgueni Poliakov**
Founder, Netherlands Economic Observatory, Netherlands

**Keynote Title: Digital Tools & E.N.H.A.N.C.E. Learning Model**

**Dr. Morris Thomas**
Assistant Provost, Digital and Online Learning & Director of the Center for Excellence in Teaching, Learning, and Assessment, Howard University, Washington, USA

**Prof. Joshua Valeta**
Director, Open, Distance and e-Learning, Ministry of Education, Malawi Government, Malawi

Dr. Joshua Valeta, is the inaugural Director of Open, Distance and e-Learning in the Ministry of Education in Malawi. He is championing increasing of access through open and distance education innovations, and mainstreaming use of education technology in teaching and learning across the education sector. His work includes driving the setting up of policies, strategies and plans for developing and implementing digital learning pathways in the education sector. He carries 17 years of experience in education.

He has a unique combination of science, leadership and education training and practice. He worked at USAID Malawi as the Senior Education Specialist after serving as the Open and Distance Learning (ODL) Director for the USAID funded program called Strengthening Higher Education Access in Malawi Activity. Before that, he managed the skills development program funded by the World Bank at the Lilongwe University of Agriculture and Natural Resources (LUANAR), where he also served as Deputy Dean of Faculty and the inaugural ODL Director. He still holds an Associate Professor position there. He is an integrated scientist, educationist, and leader. He has attended numerous leadership and management programmes, and ODeL trainings over the years, including at Harvard and Arizona State University. He also holds a PhD in aquaculture (technology) from the University of Malawi. His Master of Science Training took place at the University of Ghent, in Belgium, in collaboration with Wageningen University, in the Netherlands. His passion is in educational innovation and leadership for the advancement of education, science, and socio-economic development. He is a passionate advocate of digital learning and open schooling. Hence, he has servd as the chief advocate (public relations officers) for the Open and Distance Education Association of Malawi (ODEAMA), and the national focal point for the Distance Education Association of Southern Africa (DEASA).

**Keynote Title : Change Leadership for Blended Learning in Higher Education: the case of Malawi, the Warm Heart of Africa**

This paper arises from the analysis of reports, interviews and surveys conducted on leaders and managers of universities that have implemented blended learning and open, distance and e-learning (ODeL) in higher education over the past fourteen years in Malawi. It acknowledges the philosophy that blended learning and ODeL, as a change, have high potential to be disruptive especially in higher education where academic traditions are largely built through face-to-face instruction and collegiality. The aim was to present, for learning and improvement, approaches to change management and leadership for blended learning and ODeL. We ask three key questions: 1. Was

the introduction of blended learning and ODeL a planned change? 2. How was change leadership executed, if it was present – and if it was absent, what leadership and management approach was implemented? 3. What lessons can we draw from the implementation of blended learning and ODeL as a change or innovation?

This paper finds a clear trend differentiated by the approach to leadership and management of change. The few cases where there was a clear vision for introducing and managing blended learning and ODeL, with well-designed change management and leadership structures and practices, things started and progressed well. Overall, blended learning and ODeL have significantly contributed to increase in access rate from 0.4 to 3% in 5 years.

While most leaders of higher education exhibited confidence on broad goals for blended learning and ODeL, there was a clear lack of ownership of vision, strategy, oversight, and flexibility. The vision for blended learning was often left to those recruited as e-learning or ODeL specialists, who often do not have much influence, which is a must if real change is to happen. Leaders were less engaged with challenges that arose around blended learning and ODeL, yet it is expected of them to challenge the process, encourage creativity, and learn from mistakes made along the way. And when flexibility was needed to integrate, finance and grow blended learning and ODeL, only a few of the leaders offered it, which frustrated implementers. Leaders need to develop and champion a shared vision for blended learning and rebrand ODeL for growth. They need to reflect on their plans for blended learning and ODeL, (re)define the whole change process and how they intend to accelerate it in a smarter and more efficient way than business as usual. Leaders should intensify internal awareness building using clear messages of intent and strategy. They should create a network with nodes of champions, reinforced with relevant skills, to act as the engine for the ecosystem change.

**Dr. Morris Thomas**
Assistant Provost, Digital and Online Learning & Director of the Centre for Excellence in Teaching, Learning, and Assessment, Howard University, Washington, USA

Dr. Morris Thomas is responsible for providing visionary, strategic, and operational leadership for the Office of Digital and Online Learning and the Centre for Excellence in Teaching, Learning and Assessment (CETLA). As Assistant Provost for Digital and Online Learning, Dr. Thomas provides oversight for the selection and implementation of digital learning tools as well as the coordination for matters pertaining to online course and degree program development. He leads this office in facilitating the development and implementation of the university's digital learning infrastructure which supports the university's strategic plan. Dr. Thomas has an extensive background in facilitating learning across modalities (face-to-face, hybrid-blended, and online). Dr. Thomas also teaches in the School of Education's Higher Education Leadership and Policy Studies program. Dr. Thomas employs Quality Matters, a global recognized, peer-review process used to ensure the quality of online and blended course design. He holds several Quality Matters certifications, including Master Reviewer, Peer-Reviewer and Quality Matters Coordinator. He is also certified to facilitate the Applying the Quality Matters Rubric workshop face-to-face and online. Dr. Thomas serves as a member of the Quality Matters Academic Advisory Council (QMAAC), Echo360 Advisory Board, and McMillan Learning Micro-Credential Advisory Board. Dr. Thomas is an established scholar, his research focuses on instructional dynamics which encompass instructional domains, design, and delivery. He has developed a conceptual framework called the E.N.H.A.N.C.E. Learning Model. This conceptual framework provides seven strategies to inform intentional course design and delivery. Dr. Thomas is also the creator of the framework, "The W.H.O.L.E. Experience," a model to address Diversity, Equity, and Inclusion (DEI) in learning environments. Dr. Thomas serves as an editorial board member for the Journal of African American Males in Education, the American Research Journal of Humanities & Social Sciences, and as reviewer for the International Journal of Virtual and Personal Learning Environments. He is a frequent presenter at conferences and for webinars.

Dr. Thomas received his Ph.D. in higher education administration from Morgan State University, a M.A. in educational policy and leadership from The Ohio State University, a M.S. in instructional technology management from LaSalle University, a M.M. in classical vocal performance from New Jersey City University and a B.A. in music from Fisk University. He has completed post graduate studies at Cornell University and Georgetown University in project management and holds the Project Management Professional (PMP) certification with the Project Management Institute, Inc. (PMI). He has also completed the Diversity, Equity, and Inclusion in the Workplace Certificate from the University of South Florida Muma College of Business.

**Keynote Title: Employing the E.N.H.A.N.C.E. Learning Model and Digital Learning Tools for an Expanded Learning Experience**

The speaker will cover the dynamic combination of the E.N.H.A.N.C.E. Learning Model and Digital Tools. Research suggests it is essentially impossible to engage students in learning environments without utilizing Digital Tools. As it pertains to teaching and learning there is a need to increase rapid exchange and involve momentous discussions that facilitates higher order learning. Moreover, well-designed learning environments likely provide more meaningful learning experiences than exclusively lecture-based direct instruction. Therefore, teaching with Digital Tools should be given adequate consideration to better serve the students cognitive needs.

The E.N.H.A.N.C.E. Learning Model (ELM) which provides a conceptual framework that informs intentional course design and delivery will be presented. The speaker will also discuss Digital Tools and strategies for incorporating these tools to expand the learning experience. The participants will be introduced to the instructional dynamics involved in the ENHANCE Learning Model. the E.N.H.A.N.C.E. Learning Model (ELM), which consolidates insights from various learning science such as Blooms Taxonomy, Universal Design for Learning, Andragogy, Behaviorism, Constructivism, Connectivism, Cognitivism and more into 7 strategies. The intention is for these 7 strategies to simplify the many nuances involved in facilitating learning. The ELM comprises an acronym where each word represents a strategy (Engage, Navigate, Highlight, Assessment Network, Connect, Edutain). The ELM strategies can guide the environmental dynamics which include the circumstances or conditions that surround the social, intellectual, or moral forces that produce activity and change within the educational context. Considering the strategies outlined in the ELM can inform what learning technologies would best support the intended objectives, outcomes, and goals of a particular lesson or course. Strategies should be discovered, deployed, and frequently revised to elicit learning. Therefore, combining a learning model such as ELM and Digital Tools cooperatively, increases the potential impact is for the learners, ultimately creating an expanded learning experience.

**Dr. Evgueni Poliakov**
Founder, Netherlands Economic Observatory, Netherlands

Dr. Evgueni Poliakov has over 30-year work experience in regional economics, impact evaluation, international trade, and econometric estimation. He has a Ph.D. in Regional Science from the University of Pennsylvania as well as Master's degrees in Economics from the said university as well as the Moscow State University.

In 2022, he established the practice of Economic Development in consulting firm NEO. He works on agriculture and economic development projects, climate change action, innovation, and regional economics.

Before that, he had worked for 14 years at the Dutch Organization for Applied Scientific Research (TNO) as the Sr. Research Scientist, conducting research and consulting on policies and impact assessments in European and Dutch R&D policies, sectors, including agriculture, environment, and transport, and regional economics. In addition, he had been active in the global analysis of economic growth and poverty.

Prior, he had worked for 13 years at The World Bank in Washington, DC, specializing in agriculture, trade, and regional and macroeconomics in Europe and Central Asian countries, and Africa.

**Keynote Title : Economic Returns to Agricultural Research and Development**

Agriculture has been one of the most technologically innovative sectors over the centuries (millennia). The last hundred years' productivity depended on agricultural R&D: Over half of the productivity growth in the OECD countries resulted from R&D expenditures. The returns to R&D bring higher productivity, quality, new and improved products, and environmental and social benefits.

The crucial role of the government in R&D activities stems from market failures leading to sub-optimally low R&D expenditures by private firms/farms. Public R&D is pivotal in meeting climate change challenges (mitigation and adaptation).

Estimates of economic returns depend on the methodology applied; estimating returns is a complex task since the effects of R&D expenditures must be separated from other factors impacting productivity. Returns vary for different categories of R&D expenditures: Private vs. Public; Fundamental vs. applied research; Universities vs. research institutes (research and technology organizations); Intramural vs. extramural.

PLENARY SESSION 4

## Sustainable Digital Transformation in Education System

Chairman

**Dr. Joykrushna Jena**
DDG (Fisheries Science), ICAR, New Delhi

Convener

**Dr. Shashi Dahiya**
Principal Scientist, ICAR – IASRI, New Delhi

Rapporteurs

**Dr. Soumen Pal**
Senior Scientist, ICAR – IASRI,
New Delhi

**Ms. Sapna Nigam**
Scientist, ICAR – IASRI, New Delhi

# KEYNOTE SPEAKERS

**Keynote Title: New Education Technology in Agricultural Education**

**Dr. Alex Twinomugisha**
Senior Education Technology Specialist, The World Bank, Washington, USA (Online)

**Keynote Title: Digital Disruption for Sustainable Agriculture**

**Mr. Sudhir Kadam**
Venture Partner, and Corporate Innovation Strategist, Mountain View, California, USA

**Keynote Title: Turning a Negative into a Positive: How Mandatory Use of Asynchronous Communication Technologies During the COVID-19 Lock Down Period Inspired Continued Use of Blended Learning Tools in the Classroom.**

**Dr. Sidas Saulynas**
Lecturer, UMBC, Information Systems Department, Maryland, USA

**Keynote Title: Sustainable Business Models for Digital Innovation**

**Dr. Yanko Fernando Michea**
Director, Learning and Information Technologies, College of Education, University of Washington, USA

**Dr. Alex Twinomugisha,**
Senior Education Technology Specialist, The World Bank, Washington, USA

Alex Twinomugisha is a Senior Education Technology Specialist in the World Bank working on technology in education issues. Alex has spent over 20 years working on education and technology policy and program design, procurement and deployment at basic education (K-12), vocational and higher education levels. A core member of the World Bank's global edtech team, Alex's interests and expertise focus on designing, developing and using technology to solve some of education's most difficult challenges in developing countries.

**Keynote Title: New Education Technology in Agricultural Education**

**Mr. Sudhir Kadam**
FYDA Growth Partners Mountain View, California, USA

Sudhir has more than 3 decades of experience. He was named as 'IT Industry Leader' in 2010 by eGov (CSDMS). Currently, working as Director and Faculty – Digital Transformation with the Wadhwani Institute of Technology and Policy. Sudhir is an Adjunct Faculty with RGIPT. Sudhir has 3 Copyrights in the area of Soft Skills to his credit and a few papers published. He has varied experience in conceptualizing new initiatives, working on programs, executing projects, policy advocacy, and government ecosystem building. Sudhir is a thought leader on various aspects of Digital India. Sudhir has worked with Deloitte, Microsoft, Thomson Reuters, Oracle, IBM, and HCL & Niveshan Technologies among Indian MNCs. Sudhir is a graduate of Delhi University and ISB Alumnus.

**Keynote Title : Digital Disruption for Sustainable Agriculture**

The need for sustainable agriculture practices is becoming increasingly urgent. Digital disruption has the potential to revolutionize agriculture, enabling greater efficiency, productivity, and sustainability. This key note provides thought leadership to explore ways to harness digital disruption to create a more sustainable future for agriculture.

Digital disruption is characterized by the use of emerging technologies such as artificial intelligence, big data, the Internet of Things, and blockchain to create new business models and disrupt existing ones. The benefits of digital disruption for sustainable agriculture include increased efficiency, improved sustainability, reduced waste, enhanced traceability, and the creation of new business models.

Startups can play a key role in bringing innovation to agriculture by leveraging digital disruption. Startups have a clear advantage in driving innovation in agriculture due to their agility, entrepreneurial spirit, and collaborative approach.

Digital disruption is not without its adoption challenges due to concerns about cost, complexity, and risk, infrastructure, and data privacy and security; education plays a key role here. It is also very important to ensure collaboration among governments, industry, and society to create a supportive environment for digital disruption in agriculture, ensuring that it contributes to sustainable development and food security for all.

**Dr. Sidas Saulynas**
Lecturer, UMBC, Information Systems Department, Maryland, USA

Dr. Sidas Saulynas has nearly three decades of higher education teaching experience, most recently as an Associate Professor of Information Systems at Stevenson University. Energized by the need for effective communication, his interests include the study of Human-Computer Interaction and Presentation Theory. His research has focused on designing technology to help overcome situational impairments encountered by users of mobile devices.

**Keynote Title : Turning a Negative into a Positive: How Mandatory Use of Asynchronous Communication Technologies During the COVID-19 Lock Down Period Inspired Continued Use of Blended Learning Tools in the Classroom.**

This work examines how the use of communication technology to support meetings and facilitate communication during the lock-down scenarios brought about by the global COVID-19 pandemic inspired blended learning lessons and content that continued to add value to the classroom long after public safety measures were relaxed and face-to-face meetings returned. At the time, the use of these technologies may have been regarded simply as temporary, or as a necessary evil, until global conditions improved. This work, however, illustrates two examples of how their continued use added value in two separate University courses: (1) a Presentation Theory course, where students were required to give one presentation each semester synchronously online and (2) a Human-Computer Interaction course where one lecture was conducted on-line to dramatically illustrate the importance of social presence and information richness in human-to-human communication. These examples demonstrate the value of how technologies used in support of blended learning can be used to provide important experience in the use of modern communication mediums as well as illustrate their limitations regarding what humans continue to holistically need from a communication event.

**Dr. Yanko Fernando Michea**
Director, Learning and Information Technologies, College of Education, University of Washington

Yanko Michea is an expert in Educational Technology with more than 20 years of experience developing a broad range of educational tools and empowering innovation, and leading professional teams supporting the educational mission of public and private institutions. He has experience developing asynchronous educational modules, simulations, and other technology-based education. In his current position, Dr. Michea leads the Information and Learning Technologies unit at the University of Washington College of Education. The College has been working on expanding its online education footprint and modernizing business processes

**Keynote Title : Education After a Global Pandemic: Seeking a Sustainable Model**

The global COVID pandemic has been felt everywhere and has impacted all of us. We felt ripple effects across our society and organizations. Educational institutions had to respond quickly by adopting new strategies and embracing technology as never before. This way, the crisis became a transformative agent, accelerating change and driving a cultural shift.

Like many other educational institutions, we initially set our goal as continuing our teaching and adapting our courses to a distance learning model but maintaining a few face-to-face activities as needed by specific programs. Thanks to the agile response from teachers, students, and the whole academic organization, we successfully navigated the challenges presented. Reflecting on this experience, we take pride in this success and feel confident we can respond to this kind of emergency. But what happens once the crisis is gone? Is this a sustainable model? Is it time to think outside the box and envision new educational models?

There are mixed feelings about the future. As expected, some people hope to return to traditional delivery methods, but others question this, and others demand more flexible ones. There is high demand for hybrid delivery methods to support the work and training of a diverse population. Technology literacy has increased as faculty, staff, and students were required to work remotely. At the same time, there is valid concern about the lack of engagement associated with poor pedagogies and interpersonal development strategies in these high-tech environments.

Change is unavoidable, and we must keep working on developing learning environments for the future. We must build equitable, flexible, accessible learning experiences. These models should enable people to engage in learning, and the educational model should adapt to their needs and not the other way around. We are at a pivotal moment where we can take advantage of the momentum gained and assessed our learning ecosystem and capabilities for future change.

The discussion must consider the consistent application of sound educational practices, credentialing and regulatory needs, technology and information literacy, access, affordability, accessibility, diversity, etc. Preparing for the future, we seek a sustainable framework to guide these decisions and empower our community to navigate shifting paradigms while improving education.

PLENARY SESSION 5

## Blended Learning Ecosystem and Community Outreach

Co-Chairs

**Dr. Bhupendra Nath Tripathi**
DDG (Animal Science),
ICAR, New Delhi

**Dr. Rajender Parsad**
Director, ICAR - IASRI, New Delhi

Convener

**Dr. Ajit**
Principal Scientist, ICAR – IASRI,
New Delhi

Rapporteurs

**Dr. Soumen Pal**
Senior Scientist, ICAR – IASRI,
New Delhi

**Dr. Chandan Kumar Deb**
Scientist, ICAR – IASRI,
New Delhi

# KEYNOTE SPEAKERS

**Keynote Title: Making the most of the Digital in a Blended Learning Ecosystem**

**Ms. Denise Whitelock**
Director, Open University, United Kingdom

**Keynote Title: How Higher Education can be Connected to Community Needs in NEP 2020 through Unnat Bharat Abhiyan**

**Dr. Virendra Kumar Vijay**
National Coordinator, Unnat Bharat Abhiyan, Ministry of Education, GOI

**Keynote Title: Indian Open Data Platform Outreach - Stakeholder Outreach on Higher Education**

**Ms. Alka Mishra**
Deputy Director General, National Informatics Centre, MeitY, New Delhi

**Ms. Denise Whitelock**
Director, Open University, UK

Professor Denise Whitelock is the Director for the Institute of Educational Technology at The Open University. She is a Professor of Technology Enhanced Learning and has over twenty-five years' experience in Artificial Intelligence for designing, researching and evaluating online and computer-based learning in Higher Education. She is currently leading an innovative research programme for the Skills for Prosperity project which is supporting the Kenyan government to provide at scale, quality, open and distance learning opportunities, through training 320 staff at 37 public universities Denise recently led the UK's contribution to the Adaptive Trust e-Assessment System for Learning (TeSLA) http://tesla-project.eu/project. The overall objective of the TeSLA project was to define and develop an e-assessment system, which ensures learners authentication and authorship in online and blended learning environments while avoiding the time and physical space limitations imposed by a face-to-face examination. She is currently the Editor of Open Learning: The Journal of Open, Distance & e-Learning. Her work has received international recognition through holding visiting Chairs at the Autonoma University, Barcelona and the British University in Dubai. Denise is currently a serving Board Member and Vice President Research for EDEN Digital Learning Europe. Denise is a Fellow of the Academy of Social Sciences and Fellow of EDEN.

For complete publication list see: http://oro.open.ac.uk/view/person/dmw8.html

**Keynote Title : Making the most of the Digital in a Blended Learning Ecosystem**

Blended learning combines opportunities for interaction online with course materials together with traditional in situ classroom methods. There are several models such as the flipped classroom, flex learning and a rotation model but at the centre of all these approaches is Assessment, which is used in education to enrich, inform and complement the teaching process. Using automatic feedback, however, has been under-utilised and under-valued throughout the assessment process.

This presentation provides insight into a number of projects that have automated some aspects of assessment and feedback, including a system for language learning which is an example of an early AI system. The examples selected from my own AI research have a strong conceptual underpinning, for instance Open Mentor, used Bales' interactive categories to help tutors develop effective and supportive feedback. SafeSea, on the other hand, allowed students to trial essay writing before taking the sometimes-daunting step of submitting their first essay. This system was using analysis based on Pask's conversational framework.

Furthermore, the presentation will discuss some of the issues raised by teachers and students about digital assessment and will provide examples of how their concerns are currently being addressed by both researchers and software developers in order to support educator feedback to students. Finally, the issue of potential disrupters will be raised including the problems of plagiarism, especially with the launch by OpenAI of ChatGPT a language -generation model, that can write student assignments for them.

Bales, R.F. (1950). A set of categories for the analysis of small group interaction

Pask, G. (1976). Conversation theory: Applications in Education and Epistemology. Amsterdam, New York: Elsevier Science Limited

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**Mr. Virendra Kumar Vijay**
IREDA Chair Professor,
Centre for Rural Development and Technology,
National Coordinator: Unnat Bharat Abhiyan (UBA, MHRD, GOI), Scientific Utilization through Research Augmentation (SUTRA, MoST, GOI) & Biogas Development & Training Centre (BDTC, MNRE)

Prof. Vijay is actively engaged in cutting-edge research in rural energy technologies for developing rural communities and has made a great contribution to the academia, industry and society through research and education. He is working for a sustainable energy supply from locally available resources in villages. Prof. Vijay's work on biogas technology, particularly biogas Upgradation is well recognized at global level. He is also the national coordinator of two major national programmes of the Govt. of India, Unnat Bharat Abhiyan (UBA), that aims to utilize knowledge institutions of the country to help villages in their development and Scientific Utilisation through Research Augmentation (SUTRA) – Prime products from Indigenous Cow (Panchgavya) of ministry of science technology which will help in reinstating the cow based rural economy supported by critical scientific validation and research.

He has about above 150 publications in journals and conferences, 7 books and one lab manual to his credit. Prof. Vijay has successfully developed and patented Biogas Enrichment and bottling for Vehicular Application and transferred it to the industries and field. He is fellow life Member of various scientific and professional societies/ bodies. He is also Indian coordinator of Sustainable Energy and Environment Forum (SEE Forum) working in Asia with head quarter in Japan and General Secretary of Biogas Forum (India). Prof. Vijay has received Prakriti Bharati National Award in 2005 for S&T Application for developing biogas enrichment and bottling technology for rural sector and many more. He also headed CRDT, IIT Delhi from July 2015 to Sept 2019.

**Areas of Interest**

- Rural Energy Systems
- Green/Bio Energy Systems and applications for rural areas
- Biogas Production, Upgradation and Valorisation
- Panchgavya and its Products
- Sustainable Rural Industrialisation
- Animal Power
- Rural Energy Planning and management

**Keynote Title: How Higher Education can be connected to community needs in NEP 2020 through Unnat Bharat Abhiyan**

The National Education Policy 2020 recognizes the need for higher education institutions to be meticulously connected to the needs of the community. The National Education Policy 2020 also

strengthen higher education institutions to enlist in research activities that are relevant to the community needs and concerns. The policy recommends the establishment of community outreach programs that connect students and faculty with the community and provide opportunities for community service and experiential learning. The policy focal point also pays importance of collaboration between higher education institutions and community organizations to promote inclusive and sustainable development. It recommends the establishment of partnerships with local governments, non-profit organizations, and other stakeholders to develop programs and initiatives that address the local needs and concerns in which Unnat Bharat Abhiyan is playing a key role.

Unnat Bharat Abhiyan (UBA), a flagship program of the Ministry of Education, Govt of India as movement for progressive India, is tackling the issue at both levels of education, schools, and colleges. UBA has emerged as a source of influencer by being associated with nearly 3500 Higher Education Institutions, 17500 plus villages, with many lakhs students of technical and non-Tech colleges participating in UBA actively. Vision and Mission of the Unnat Bharat Abhiyan are as follows:

***Unnat Bharat Abhiyan is inspired by the vision of transformational change in rural development processes by leveraging knowledge institutions to help build the architecture of an inclusive India with experiential learning in students and teachers of Higher Educational Institutions.***

**Mission:**

a. **Reorientation** of academic curricula and research programs in alignment with the needs of (rural) communities/ society.

b. **Knowledge** (**S&T) interventions** suited to local needs through efficient natural resource management in rural areas.

c. **Convergence** among educational institutions, PRIs, district administration, voluntary organizations and grassroots for effective planning, field implementation, and monitoring.

**Ms. Alka Mishra**
Senior Technical Director, National Informatics Center

Ms. Alka Mishra has over 33 years of experience in the Premier IT organization (National Informatics Centre, NIC) of the Government of India and currently serving as Deputy Director General. She has been one of the driving forces behind the architecture of the citizen engagement and service delivery e-governance platforms, the largest crowdsourcing platform of the Government of India such as MyGov and the National Portal of India.

**Keynote Title: Indian Open Data Platform Outreach - Stakeholder Outreach on Higher Education**

Agriculture being a most important sectors contributing significantly to the country's economy and providing employment to a large percentage of the population. Data has always been important be it weather, soil, crop yield or market data it's essential for making informed decisions to enhance agricultural production or marketing. In recent years, with the increasing availability of data and advancements in technology, there has been a growing movement toward making agricultural data more open and accessible to everyone.

The government has been collecting agriculture data for decades through various surveys, schemes, censuses, IT systems, etc. Dedicated data units at various levels in the government have played a vital role in releasing these datasets into the public domain. Open Government Data (OGD) Platform has been constantly extending support dissemination of datasets from agriculture sector. More than 1,27,000+ datasets are available on the Platform for public use.

The published datasets on weather, soil, crop yield, agriculture research, farmer's welfare, horticulture, livestock, fisheries, policy, research, market data, etc. are few widely used for use cases such as – improving agricultural productivity, supporting research and innovation, supporting sustainable agriculture, enhancing food security, encouraging transparency and accountability, etc.

OGD Platform is one of the biggest repositories datasets supporting agriculture education. Scholars and researchers are using these datasets for enlightened their research activities. However, to make it more useful cleaned data submitted by each researcher may be taken into consideration and made available for better usage.

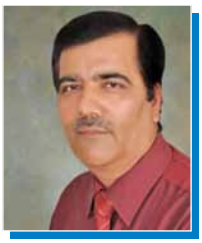
By making agriculture data more accessible to everyone, we can ensure that everyone has access to the information they need to make informed decisions about food and agriculture.

# PANEL DISCUSSIONS

## PANEL DISCUSSION –1

# Exploring Effective Strategies of Blended Learning for Higher Education in Agriculture

Co-Chairs



**Dr. S N Jha**
DDG (Agricultural Engineering),
ICAR, New Delhi

**Dr. P S Pandey**
VC, Dr. Rajendra Prasad Central Agricultural University, Bihar

Convener

**Dr. Anuradha Agrawal**
National Coordinator, NAHEP (Component 2 and CAAST), ICAR, New Delhi

Moderator

**Dr. Surinder Singh Chauhan**
Senior Lecturer Animal Science, School of Agriculture and Food, The University of Melbourne, Australia

Rapporteurs

**Dr. Md Ashraful Haque**
Scientist, ICAR – IASRI, New Delhi

**Mr. Samarth Godara**
Scientist, ICAR – IASRI, New Delhi

## MODERATOR

**Dr. Surinder Singh Chauhan**

Director International, School of Agriculture and Food, and the Deputy Director of Melbourne India Postgraduate Academy (MIPA), The University of Melbourne, Australia

Dr. Chauhan has more than 15 years of track record of research and teaching in veterinary and animal sciences in three countries including Australia, India, and USA. Before moving to Australia, Dr. Chauhan served the State of Himachal Pradesh, India, for 20 years as Veterinary Officer. Dr. Chauhan moved to Australia in the year 2011 following his selection for AusAID Australian Leadership Award and completed his PhD at The University of Melbourne in 2014. Following his PhD, Dr. Chauhan provided his services as Senior Veterinary Officer in the State of Himachal Pradesh, India. Later Dr. Chauhan completed his Post-doctorate in Animal and Meat Science at The Ohio State University, USA.

Currently at The University of Melbourne, Dr. Chauhan is leading the Australia-India Collaboration for Sustainable Livestock Production funded by the Australian Government DFAT Australia-India Council. Dr. Chauhan is also the recipient of UOM India Engagement Seed Grant 2020 and has been collaborating with ICAR institutes and Indian Agricultural Universities, to promote the sustainable intensification of integrated crop-livestock systems for improving smallholder livelihoods.

## PANELISTS

**Dr. J.C. Katyal**

Former DDG and Former Vice Chancellor, Hisar Agricultural University, India

Dr. Katyal is one of the most learned research scholars in the domain of soil sciences. He has been an advocate in pushing forward the agenda of adaptation of new technologies in agricultural higher education. He is also recipient of several national and international recognitions and awards that include FAI Excellence in Agricultural Research (1984); IFDC Best Visiting Scientist, (1986); Borlaug Award (1995); APSEE Design and Development of Farm Machinery Award (1996); ICAR Best Institute Award (1996); Rafi Ahmad Kidwai Award (1996); TNAU Best Soil Scientist Award (2002); Ranade Trust Lifetime Achievement Award (2001); Rajiv Gandhi Award (2007). He served as President, Indian Society of Dryland Agriculture and Indian Society of Soil Science. He has been honoured as

Fellow of Indian Society of Soil Science and National Academy of Agricultural Sciences; Member of Indian Society of Soil Science. His key areas of research areas are soil chemistry and fertilizers, micronutrients, dryland agriculture, land degradation and desertification.

**Mr. Claus Rainer Michalek**

Head of Teaching and Learning Services, University of Natural Resources and Life Sciences, Vienna, Austria

Mr. Michalek is head of Teaching and Learning Services and head of the Division of E-Learning and Didactics. He graduated in landscape architecture and planning at the University of Natural Resources and Life Sciences, Vienna and has been responsible for the introduction and establishment of new forms of teaching and learning at BOKU (University of Natural Resources and Life Sciences, Austria) since 2004. He is active in national and international networks (e.g. Forum Neue Medien in der Lehre Austria, Academic Moodle Cooperation, Euroleague for Life Sciences). He has served as the head of the unit "E-Learning and Didactics" at the "Centre for Teaching and Learning" in Vienna. He is known for his eloquent perspective on the new perspectives of scientific research and education. His current research focus is mobile learning and the usability associated with it.

**Dr. Sidas Saulynas**

Lecturer, UMBC, Information Systems Department, Maryland, USA

Dr. Saulynas is a Lecturer in the Department of Information Systems at The University of Maryland Baltimore County (UMBC). His Ph.D. is in Human-Centered Computing, conferred at UMBC. He also holds Master's degrees in Finance (University of Baltimore) and in Human-Centered Computing (UMBC) and bachelor's degrees in Psychology (Dickinson College) and Computer Information Systems (Stevenson University). He is one of the leading thinkers in the field of the use of information systems to foster education and other services across various streams. His teaching emphasizes three elements: (1) exploiting the holistic nature of the multi-disciplined domains inherent in an educational institution, (2) emphasizing the "why" of a lecture topic and (3) practicing kinesthetic learning.

**Dr. Basheerhamad Shadrach**

Director, Commonwealth Educational Media Centre for Asia (CEMCA), New Delhi, India.

Dr. Shadrach joined as Director, Commonwealth Educational Media Centre for Asia (CEMCA) on 1 June 2022. Until recently, he served the Commonwealth of Learning as Adviser: Skills with responsibility for the Skills for Work initiative. He is an expert on implementable effective strategies to impart higher education. He is an advocate for value-based education.

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**Dr. Abdur Rab Miah**

Vice Chancellor, International University of Business Agriculture & Technology, Dhaka, Bangladesh.

Prof. Rab was the Pro Vice Chancellor and Vice Chancellor of Eastern University, Dhaka Bangladesh. He was a Professor of the Institute of Business Administration (IBA) in Dhaka University for over 33 years and it's Director for three years. He was also the Dean of BRAC Business School and Professor of Management in North South University.

He served as the Vice President and thereafter as President of the Association of Management Development Institutions in South Asia (AMDISA) for three years. Prof. is a member of the Accreditation Council and the Accreditation Award Committee of the South Asian Quality System (SAQS)). He is also a member of the Executive Board of AMDISA. Prof. Rab is a Certified Management Consultant from Australia and a Fellow of the Institute of Management Consultants, Bangladesh (IMCB). He was also its Chairman in 2010-2012. Dr. Rab is a Visiting Professor of International Business Management in the School of Economics and Management of Yunan Normal University, China.

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**Dr. G. Sugumar**

Vice Chancellor, Tamil-Nadu Fisheries University, India

Dr. Sugumar has a University service of 33 years possessing a rich teaching, research, extension and administrative experience. A Professor of Fisheries Microbiology, he served as Dean of Fisheries College and Research Institute, Thoothukudi, Tamilnadu from 2013 to 2018. He has a Ph.D. in Fishery Microbiology from UAS, Bangalore in 1994. He was a recipient of Japanese Government Scholarship and has carried out Postdoctoral research at the Faculty of Applied Biological Sciences of Hiroshima University, Japan from 1996 to 1998 and also won FAO fellowship under Agricultural Human

Resource Development Project (AHRDP) for undergoing a specialized training on Molecular Diagnostics at the Texas A&M University, USA during August – October 2000. He was appointed as Joint Special Officer (JSO) by the Government of Tamil Nadu for establishment of Tamil Nadu Fisheries University in February 2012. He was part of the ministerial delegation to Malaysia, China and South Korea in 2012. He was conferred with the "Best Teacher Award" by the Professional Fisheries Graduates Forum, Mumbai in the years 2003, 2008 and 2011. He has been appreciative of the use of technology to impart agricultural higher education.

**Dr. Poorna Gunasekera**

Associate Dean International, Peninsula Medical School University of Plymouth, UK.

Dr. Gunasekera is a Member of the Faculty Research Ethics committee. He worked as Associate Professor in Biomedical Sciences; Lead of Tissue Pathology; Co-lead for Overseas Student Support, Mentor, Academic and Pastoral Tutor at the Peninsula Medical School University of Plymouth, UK. He has worked with wide array of students from different streams. His current research is about empowering individuals and communities to have greater control over their own health. This was also evident from his TEDx talk in 2018 on "The legacy of self-discovery".

**Dr. Garth Maker**

Associate Professor and President of the University Academic

Council, Murdoch University, Australia

Dr. Garth Maker is Associate Professor of Biochemistry at Murdoch University, and President of the University's Academic Council. He is an award-winning teacher and research in the areas of biochemistry and toxicology, with a focus on herbal medicines and dietary supplements. Garth has been implementing blended learning strategies for more than 10 years and spent the past two years as Dean of Learning & Teaching for the College of Science, Health, Engineering and Education in Murdoch University, Australia. In this role, he led the development of numerous initiatives delivering blended learning and assessment activities. His specific interests are the development of quantitative and practical skills using interactive online tools, and the potential of online delivery to enhance student learning outcomes in complex disciplines such as biochemistry. He is a leading researcher in the field of biochemistry. He has been using many blended tools for sharing research and new developmental studies.

## PANEL DISCUSSION – 2

# Making Agricultural Education Future Ready with 3 Es: Emerging Technologies, Employability and Entrepreneurship

Co-Chairs

**Dr. S K Chaudhuri**
DDG (Natural Resource Management), ICAR

**Dr. Dheer Singh**
VC & Director, ICAR-National Dairy research institute, Karnal

Convener

**Dr. P Ramasundaram**
National coordinator (IDP), PIU, NAHEP, ICAR

Moderator

**Mr. Guna Nand Shukla**
Director, PricewaterhouseCoopers (PwC), New Delhi

Rapporteurs

**Dr. Md Ashraful Haque**
Scientist, ICAR – IASRI, New Delhi

**Ms. Sapna Nigam**
Scientist, ICAR – IASRI, New Delhi

## MODERATOR

**Mr. Guna Nand Shukla**

Director, PricewaterhouseCoopers (PwC), New Delhi

Mr. Guna is presently the Director of Agri & Natural Resource (A&NR) practice at PwC. He is leading the implementation of projects ranging Agri transformation to programme implementation in areas such as Agri education, Agri supply chain and reforms initiative in Agribusiness with multiple states and union Government.

His experience ranges from policy reforms across the Agri value chain, along with providing alternative and innovative solutions to small and marginal farmers in terms of reach to factors of production. He has also been deeply engaged in promoting private investments in Agribusiness, providing hand holding support to investors.

## PANELISTS

**Dr. Bidyut Deka**

Vice Chancellor, Assam Agricultural University, Jorhat, India.

Dr. Deka obtained his Ph.D. from Indian Agricultural Research Institute (IARI), New Delhi in 2000. Dr. Deka started his carrier as a scientist at Assam Agricultural University, Jorhat and worked there till March 2007 in different capacities as a Teacher and Researcher. In March 2007, he joined ICAR research complex for NEH Region, Umiam as Principal Scientist, Division of Horticulture and continued his service at ICAR in different capacities like Joint Director, ICAR Research Complex for NEH Region (2011-16) and Director, ICAR-ATARI, Umiam (2016-2020) till he joins as VC, AAU, Jorhat on October 22, 2020.

In his long service career at different places, Dr. Deka contributed immensely to the cause of overall agricultural sciences, notable among which were the conservation and utilization of crops (several accessions of rice, maize, ginger, turmeric, local fruits, guava and perila etc at NBPGR, New Delhi).

**Dr. Nazir Ahmad Ganai**

Vice Chancellor, Sher-e-Kashmir University of Agricultural Sciences and Technology, SKUAST-Kashmir.

Prof. Ganai joined the SKUAST University in 1993. During his illustrious career he has served the University in different capacities as Associate Director Research, Founder Head, Division of Biotechnology, Head Division of Animal Genetics & Breeding, Coordinator H R D Program (Biotechnology), Coordinator Star College Program, DBT, MoST GoI, Coordinator Bioinformatics Center DBT, MoST GoI, In-Charge Sheep Research Station, In-Charge Cattle Research station, SKUAST–Kashmir. Under his able guidance, university has received significant funding and he has been pioneer in initiating many activities like Centre of Excellence on AI/Machine Learning and modernisation of infrastructure at University.

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**Prof. Atul Khosla**

Founder and Vice Chancellor, Shoolini University, Himachal Pradesh

Prof. Atul started his career with McKinsey and Company, the world's leading consulting firm. In the last 25 years as a consultant, he has advised clients in varied geographical locations including India, Asia, North America, Europe and Australia. Prior to joining Shoolini University, he was India CEO and Global Partner at Oliver Wyman, the leading international consulting firm.

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**Dr. Sudha Rao**

CEO, Sri Dharmasthala Manjunatheshwara Education Society, India

Prof. Rao is a Former Vice Chancellor of Karnataka State Open University, Mysore, Karnataka (2003-2007); Executive Director and Member Secretary, Karnataka Knowledge Commission, Bangalore; Fulbright Scholar to Harvard University, Cambridge, USA; Senior Advisor to All India Council for Technical Education (AICTE) (1992-1996), New Delhi; Chief Executive Officer at SDM Education Society, Bangalore. She served as Prof and Head of Higher Education and Education Policy.

She has presented several papers and collaborated with leading education experts in USA, U.K., Australia, Middle East, Canada, Philippines, Sri Lanka, Singapore, Hongkong, Bangkok and other countries. Her contribution to Higher education in India through national level regulatory bodies

such as UGC, AICTE, ICAR, NCTE, NAAC, DEC, IGNOU, MHRD, ICAR (IARI)New Delhi, NAARM, Hyderabad and other national and international agencies such as UNESCO, UNICEF, ESCAP and other State Governments is well established and was exemplary.

**Dr. Inu Rana**

Senior Business Advisor, Western Sydney University, Australia (Virtually).

Dr. Rana has spent the last 22 years managing businesses, consulting & advising businesses, supporting startups and contributing to executive training & development, and research. She has worked extensively in the tech startup space in Sydney and teaches entrepreneurship to gaming AR/VR students.

She started her career joining her family business of Pharmaceuticals in Delhi, India and continues to serve on the board. She served on the panel of the National Productivity Council, India, for several years before moving to Australia permanently and joining Western Sydney University. She has delivered multiple talks at global seminars, has addressed and trained senior and top management, and has been recognised for her practical, no-fuss approach. Her ability to connect strategy to real-life business stories helps her engage her audience at a highly individual level. She has worked across the South Asian region with top MNCs and industries. She has worked extensively in the tech startup space in Sydney and teaches entrepreneurship to AR/VR students.

**Prof. Perry Den Brok**

Professor, Department of Social Sciences, Wageningen University, Netherlands.

Dr. Brok is Chair of the Education and Learning Sciences group at Wageningen University and Research, and chair of the 4TU Centre for Engineering Education. His research interests and expertise concern innovation in higher education, learning environments, teacher professional development and teacher learning. He has published several articles and book chapters on these topics, supervises PhD students in these domains of research. He also still teaches in the teacher education programme. He is part of the innovation board at his university and involved in innovation related activities.

**Dr. David Kraybill**

Professor Emeritus, Ohio State University, Washington DC - Baltimore Area, USA (Virtually).

Dr. Kraybill's recent research includes studies of household poverty, household savings, governmental decentralization, primary and secondary education, and adaptation to climate change. Fluent in French and a Swahili speaker, he has lived in Africa for five years, including a sabbatical year as Fulbright Scholar at Makerere University in Uganda. Kraybill has served as Associate Editor or member of editorial boards of seven academic journals.

## PANEL DISCUSSION – 3

**Accelerating Digital Development Through Effective Capacity Building and Change Management**

Chairperson

**Dr. V Geethalakshmi**
Vice Chancellor, Tamil Nadu Agricultural University

Convener

**Dr. Alka Arora**
Head (A), Computer Application,
ICAR-IASRI, New Delhi

Moderator

**Mr. Amit Vatsyayan**
Social and Skills, Partner, Ernst & Young LLP (EY)

Rapporteurs

**Dr. Chandan Kumar Deb**
Scientist, ICAR – IASRI, New Delhi

**Mr. Samarth Godara**
Scientist, ICAR – IASRI, New Delhi

## MODERATOR

**Mr. Amit Vatsyayan**

Social and Skills, Partner, Ernst & Young LLP (EY)

Mr. Amit is a Partner with EY and leads the Rural Development and Livelihood, Advisory Practice for EY India. He brings in more than 17 years of experience across 20 countries on livelihood, gender and economic empowerment and has been involved in several policy making as well as practical implementation across diverse geography. He has completed Business Economics programme from Oxford University and holds a Post Graduate Diploma form Indian Institute of Forest Management.

## PANELISTS

**Dr. Satender Singh Arya**

CEO, Agriculture Skill Council of India, India.

Dr. Arya has been working as a Chief Executive Officer at Agriculture Skill Council of India for 10 years. Agriculture Skill Council of India is part of the Education industry and is a specific body that promotes agrarian skills with an impact directly on the livelihoods of the farmers.

**Dr. Gopesh Tiwari**

Head of Education, International Rice Research Institute (IRRI), Los Baños, Calabarzon, Philippines.

Dr. Gopesh is heading IRRI Education, which is the educational arm of IRRI and is at the forefront of imparting education and capacity development programs to its partners in the global south in various disciplines of rice science and technology and offering diverse and global learning experiences since 1962. He has extensive 16 years of experience in Education, Capacity Development, Agriculture, Rural Development, Technical and Vocational Education and Training (TVET) / Skills Development, and ICT for Development of projects under advisory and implementation.

**Dr. Dough Steele**

Vice President, Food Agriculture and Natural Resources, Association of Public and Land-grant Universities (APLU), Washington DC, USA.

In his vast career of more than 26 years, Dr. Steele has been the Director at Texas A&M AgriLife Extension Service and Senior Director of International Extension Programs at Borlaug Institute for International Agriculture. He has been one of the key thinkers in the areas of technological adaptability in the fields of research. Through collaborative partnerships with over 250 member institutions, including 115 Colleges of Agriculture and Natural Resources, he provides leadership with a focus on broad cross-cutting issues related to agriculture, food and fiber, forestry, human sciences, natural resources, and veterinary medicine. Priority areas include advocating yearly on behalf of the agricultural research, extension, and education funding in support of land-grant universities with an emphasis on climate resiliency, soil health, water management, land stewardship and the nexus between agriculture/ food/ nutrition/ wellness. He believes in the power of public higher education and the Land-Grant University system to provide access and affordability to higher education to students, address the agriculture challenges of feeding a growing population, increase the profitability of agricultural enterprises and sustainability, and transform families, youth, and communities.

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**Dr. Ch. Srinivasa Rao**

Director, ICAR-National Academy of Agricultural Research Management (NAARM), Hyderabad, India.

Dr. Rao has been one of the biggest advocates of the use of technology to bring about change in the domain of agricultural higher education. His research areas of interest include, but not limited to, Climate Change, Contingency Planning, Soil Carbon Sequestration, Rainwater Management, Climate Resilient Villages, Rainfed Mission Development, Climate and Conservation Policy and Agriculture Research Management. He received several awards which includes Rafi Ahmed Kidwai Award for Outstanding Research in Agricultural Sciences, 2019 in the field of Natural Resources Management and Agricultural Engineering (2019); Life Time Achievement Award from Andhra Pradesh Akademi of Sciences, Amaravati, Andhra Pradesh (2019); Sardar Patel Outstanding Research Institute Award of ICAR – 2014 & 2021. He is a Fellow of Indian National Science Academy (FNA); The National Academy of Sciences, India (NASI), Indian Society of Soil Science; Indian Society of Pulses Research and Development etc.

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**Dr. Yanko Fernando Michea**

Director, Learning and Information Technologies, College of Education, University of Washington

Dr. Michea is an expert in Educational Technology with more than 20 years of experience developing a broad range of educational tools and empowering innovation, and leading professional teams supporting the educational mission of public and private institutions. He has experience developing asynchronous educational modules, simulations, and other technology-based education. In his current position, he leads the Information and Learning Technologies unit at the University of Washington College of Education. The College has been working on expanding its online education footprint and modernizing business processes.

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**Dr. Sajid Pareeth**

Senior Lecturer, IHE Delft Institute for Water Education, Netherlands

Dr. Sajid Pareeth is a senior researcher at IHE Delft Institute for Water Education in Netherlands. He has 15 years of international experience in implementing remote sensing-based technologies for sustainable land and water use. His main research focus in recent years has been to develop crop monitoring systems using satellite-based estimation of water use and productivity at different scales from a farm to basin. He contributes to several projects in Asia and Africa funded by European Union (EU), Dutch ministries, United Nations FAO and Asian Development Bank (ADB) on remote sensing for agricultural water management. Sajid obtained his PhD in Natural Sciences and MSc from Germany. He was a DAAD scholarship recipient in Germany and started as a Marie curie fellow at IHE Delft. Dr. Sajid has developed key educational modules in remote sensing for agriculture water management as part of MSc programs at IHE Delft. He has delivered lectures in various training and capacity development programs in Asia and Africa mainly catering to the government and academia in respective countries. He has also been developing tailor made trainings in order to help agencies to adapt technological interventions in monitoring agricultural land and water use. Prior to IHE Delft, Sajid worked at the International Water Management Institute (IWMI), Colombo, Sri Lanka and been working as consultant to various donors.

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**Mr. Sudhir Agrawal**

Director and Faculty - Digital Transformation, Wadhwani Foundation, India

Mr. Sudhir Aggarwal has more than a decade of experience and the last 20 years dedicatedly to the Government ecosystem in India. He has varied experience in conceptualizing new initiatives and working on programs, execution of projects, policy advocacy, and ecosystem building. Sudhir is a thought leader on various aspects of Digital India. He has 3 Copyrights to his credit and has worked with Deloitte, Microsoft, Thomson Reuters, Oracle, IBM, and HCL among Indian MNCs. He is a graduate of Delhi University and ISB Alumni.

PANEL DISCUSSION – 4

## Digital Transformation in Education Sector

Co-Chairs

**Dr. Udham Singh Gautam**
DDG (Agricultural Extension), Division of Agricultural Extension, ICAR

**Dr. Triveni Dutt**
VC & Director, ICAR-Indian Veterinary Research (IVRI), Bareilly, India

Convener

**Dr. Anshu Bharadwaj**
Principal Scientist, ICAR-IASRI, New Delhi

Moderator

**Mr. Vikas Aggarwal**
Partner, Consulting, Ernst & Young LLP (EY)

Rapporteurs

**Dr. Sanchita Naha**
Scientist, ICAR – IASRI, New Delhi

**Ms. Madhu**
Scientist, ICAR – IASRI, New Delhi

## MODERATOR

**Mr. Vikas Aggarwal**

Partner, Education Technology, EY LLP

Mr. Aggarwal is a Partner in Technology Consulting at EY, handling engagements with the government on smart cities, digital infrastructure, and education. He has more than 25 years of experience in Technology Advisory, Technology Solutions & Services. His technology-led transformation, Process Intervention and PPP in Technology has brought many defining changes to the edu-tech sector. He has led advisory engagements in India, Middle East, the Caribbean, and ASEAN countries with a focus on Optimum Service Delivery, Government Process Engineering, Citizen Centricity, and ICT Intervention to bring efficiency, transparency, and effectiveness in the functioning of the Public Sector. Prior to the current position with EY, he has worked in leadership positions with Microsoft, KPMG, PWC, Gartner Research and CMC Ltd.

## PANELISTS

**Dr. Rajender Parsad**

Director, ICAR – Indian Agricultural Statistics Research Institute, India.

Dr. Parsad's research areas are in the fields of Agricultural Statistics, Design of Experiments, and Sampling Techniques. Besides receiving numerous awards and recognitions, he has also received the National Award in Statistics in Honour of Professor CR Rao, 2011; Gold Icon Award under Open Data Championship Category, MEITY, Govt. of India 2020; Professor PV Sukhatme Gold Medal Award, ISAS 2010; Recognition Award (2015-2016). He is a fellow of NAAS, Indian Society of Agricultural Statistics; Elected Member of International Statistical Institute, Netherlands. He has been the driving force behind many digital initiatives taken by ICAR for transforming the education sector.

**Mr. Werner Wutscher**

Mr. Former Secretary General, Federal Ministry for Agriculture, Environment, Forestry, and Water Management, Austria

Mr. Wutscher is a Member of the Board of resPACT, the Austrian Business Council for Sustainable Development. He also works as consultant and business angel in the start-up area. He scouts interesting start-ups around the world and serves as a facilitator for start-up ventures. As an angel investor he focuses on e-commerce and retail. He also serves as Director on different boards in Austria, Mumbai and Amman. He is a man with broad leadership experience in the private sector and public administration in Austria and abroad. He is the former Secretary General of Austria's Federal Ministry for Agriculture, Environment, Forestry, and Water Management. With his broad experience as an entrepreneur and founder of New Venture Scouting, he promotes development, management, and evaluation of start-up-friendly ecosystems in the fields of research and development.

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**Mr. Vikas Kanungo**

Sr. Digital Development Specialist, The World Bank, India

Mr. Kanungo is a recognized leader in the fields of digital development and IR 4.0 digital strategies, with over 30 years of expertise in e-Governance, m-Governance, Smart Cities, and Disruptive technologies environment in different World Bank projects.

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**Mr. Gaurav Gupta**

Chief Growth Officer, EkStep Foundation, India

Mr. Gupta is EdTech CXO, Growth Hacker, Population scale problem solver, CXO Influencer, Business and P&L leader with 20+ years of experience. He has played many roles during his tenure of being an Investor, Mentor, Problem Solver, Growth Hacker and Consultant to diverse businesses across industries and geographies to help them solve their problems and grow their business to population scale. He has primarily been a start-up guy who has worked at many start-ups and seen them through their growth journeys.

**Dr. Poorna Gunasekera**

Associate Dean International, Peninsula Medical School University of Plymouth, UK

Dr. Gunasekera is a Member of the Faculty Research Ethics committee. He worked as Associate Professor in Biomedical Sciences; Lead of Tissue Pathology; Co-lead for Overseas Student Support, Mentor, Academic and Pastoral Tutor at the Peninsula Medical School University of Plymouth, UK. He has worked with wide array of students from different streams. His current research is about empowering individuals and communities to have greater control over their own health. This was also evident from his TEDx talk in 2018 on "The legacy of self-discovery".

**Dr. Balakrishnan Prithiviraj, Ph.D.**

Associate Vice President (Global Relations) at Dalhousie University, Halifax, Canada

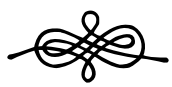
Dr. Prithiviraj is part of senior leadership team of Dalhousie University since 2020. He has published more than 140 peer reviewed publications and has 5 patents. Some of his patents are now commercialized with products in the marketplace. His group was the first to work and publish on the mechanism(s) of action of seaweed biostimulants and has significantly contributed to this field of research. He has supervised more than 50 undergraduate/ graduate and post-doctoral students.

# ABOUT ORGANIZERS


## Indian Council of Agricultural Research

The Indian Council of Agricultural Research (ICAR) is an autonomous organization under the Department of Agricultural Research and Education (DARE), Ministry of Agriculture and Farmers Welfare, Government of India. Formerly known as Imperial Council of Agricultural Research, it was established on 16 July 1929 as a registered society under the Societies Registration Act, 1860 in pursuance of the report of the Royal Commission on Agriculture. The ICAR has its headquarters at New Delhi. The Council is the apex body for coordinating, guiding and managing research and education in agriculture including horticulture, fisheries and animal sciences in the entire country. The ICAR has played a pioneering role in ushering Green Revolution and subsequent developments in agriculture in India through its research and technology development that has enabled the country to increase the production of food grains by 5.6 times, horticultural crops by 10.5 times, fish by 16.8 times, milk by 10.4 times and eggs by 52.9 times since 1950-51 to 2017-18, thus making a visible impact on the national food and nutritional security. It has played a major role in promoting excellence in higher education in agriculture. It is engaged in cutting edge areas of science and technology development and its scientists

Website URL: https://icar.org.in/




## The World Bank

The World Bank Group is one of the world's largest sources of funding and knowledge for developing countries. Its five institutions share a commitment to reducing poverty, increasing shared prosperity, and promoting sustainable development. With 189-member countries, staff from more than 170 countries, and offices in over 130 locations, the World Bank Group is a unique global partnership: five institutions working for sustainable solutions that reduce poverty and build shared prosperity in developing countries. Together, IBRD and IDA form the World Bank, which provides financing, policy advice, and technical assistance to governments of developing countries. IDA focuses on the world's poorest countries, while IBRD assists middle-income and creditworthy poorer countries.

Source: https://www.worldbank.org/en/who-we-are.

# ICAR- Indian Agricultural Statistics Research Institute

ICAR-Indian Agricultural Statistics Research Institute (IASRI) is a pioneer institute of Indian Council of Agricultural Research (ICAR) undertaking research, teaching and training in Agricultural Statistics, Computer Application and Bioinformatics. Ever since its inception way back in 1930, as small Statistical Section of the then Imperial Council of Agricultural Research, the Institute has grown in stature and made its presence felt both nationally and internationally. ICAR-IASRI has been mainly responsible for conducting research in Agricultural Statistics and Informatics to bridge the gaps in the existing knowledge. It has also been providing education/ training in Agricultural Statistics and Informatics to develop trained human resources in the country. The research and education are used for improving the quality and meeting the challenges of agricultural research in newer emerging areas.

Website URL: https://iasri.icar.gov.in/

# ORGANIZING COMMITTEE

# International Conference on Blended Learning Ecosystem for Higher Education in Agriculture (ICBLE 2023)

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# International Conference on

# BLENDED LEARNING ECOSYSTEM FOR HIGHER EDUCATION IN AGRICULTURE (ICBLE 2023)

Bharat Ratna C. Subramaniam Auditorium, National Agricultural Science Complex, New Delhi, India

## March 21-23, 2023

## PROGRAM SCHEDULE

(Time indicated in IST)

| DAY 1: MARCH 21, 2023 (TUESDAY) | | |
|---|---|---|
| **9.00 - 10.00 AM** | **Registration** | |
| **10.00 - 11.45 AM** | **Plenary Session 1 – Modernization of Agricultural Education** | |
| **Co-Chairs** | **Dr. R.C. Agrawal**<br>Deputy Director General (Agricultural Education) & ND, NAHEP, ICAR, New Delhi<br>**Dr. Anupama Singh**<br>Joint Director, ICAR – Indian Agricultural Research Institute, New Delhi | |
| **Convener** | **Dr. Seema Jaggi**<br>Assistant Director General (HRD), ICAR, New Delhi | |
| **Rapporteurs** | **Dr. Soumen Pal and Dr. Chandan Kumar Deb**<br>ICAR-IASRI, New Delhi | |
| **10.00 - 10.20 AM** | **Keynote Lecture 1**<br>Modernization of Agricultural Higher Education in India & the Roadmap for Implementation of New Education Policy 2020 | **Dr. R.C. Agrawal**<br>DDG (Agricultural Education) & ND, NAHEP, ICAR, New Delhi |
| **10.20 - 10.40 AM** | **Keynote Lecture 2**<br>Blended Learning - New Opportunities for Higher Agricultural Education in India | **Dr. Bekzod Shamsiev**<br>Task Team Leader (TTL), NAHEP, The World Bank, Washington, USA |
| **10.40 – 11.00 AM** | **Keynote Lecture 3**<br>Drawing from Global Experiences of Higher Agriculture Education and Innovation on Agriculture and Agribusiness Development | **Mr. Werner Wutscher**<br>Former Secretary General, Federal Ministry for Agriculture, Environment, Forestry, and Water Management, Austria |

| DAY 1: MARCH 21, 2023 (TUESDAY) | | |
|---|---|---|
| **11.00 - 11.20 AM** | **Keynote Lecture 4**<br>Steering tertiary education toward resilient systems that deliver for all | **Mr. Denis Nikolaev**<br>Senior Education Specialist, World Bank |
| **11.20 – 11.45 AM** | **Discussion and Co-Chair Remarks** | |
| **11.45 AM – 12.55 PM** | **Meet & Greet and High Tea** | |
| **1.00 – 2.30 PM** | **Inaugural Session – Exhibition and Conference** | |
| **2.30 – 3.30 PM** | **Lunch** | |
| **3.30 – 5.00 PM** | **Panel Discussion – 1: Exploring Effective Strategies of Blended Learning for Higher Education in Agriculture** | |
| **Co-Chairs** | **Dr. S.N. Jha**<br>DDG (Agricultural Engineering), ICAR, New Delhi<br>**Dr. P.S. Pandey**<br>Vice Chancellor, Central Agricultural University, Bihar | |
| **Convener** | **Dr. Anuradha Agrawal**<br>National Coordinator, NAHEP (Component 2 and CAAST), ICAR, New Delhi | |
| **Moderator** | **Dr. Surinder Singh Chauhan**<br>Senior Lecturer Animal Science, School of Agriculture and Food, The University of Melbourne, Australia | |
| **Rapporteurs** | **Dr. Md. Ashraful Haque and Mr. Samarth Godara**<br>ICAR-IASRI, New Delhi | |
| | **Panelists** | |
| | 1. **Dr. J.C. Katyal**<br>Former DDG (Agricultural Education), ICAR and Former Vice Chancellor, CCS Hisar Agricultural University, Hisar<br>2. **Mr. Claus Rainer Michalek**<br>Head of Teaching and Learning Services, University of Natural Resources and Life Sciences, Vienna, Austria<br>3. **Dr. Sidas Saulynas**<br>Lecturer, University of Maryland, Baltimore County<br>UMBC, Information Systems Department, Maryland, USA<br>4. **Dr. Basheerhamad Shadrach**<br>Director, Commonwealth Educational Media Centre for Asia (CEMCA), New Delhi<br>5. **Dr. Abdur Rab Miah**<br>Vice Chancellor, International University of Business Agriculture & Technology, Dhaka, Bangladesh<br>6. **Dr. G. Sugumar**<br>Vice Chancellor, Tamil-Nadu Fisheries University, Chennai<br>7. **Dr. Poorna Gunasekera**<br>Associate Dean International, Peninsula Medical School University of Plymouth, United Kingdom<br>8. **Dr. Garth Maker**<br>Associate Professor and President of the University Academic Council, Murdoch University, Australia (Online) | |

| DAY 1: MARCH 21, 2023 (TUESDAY) | | |
|---|---|---|
| **5.00 – 5.30 PM** | **Discussion and Co-Chair Remarks** | |
| **5.30 – 7.30 PM** | Exhibition visit and Networking meetings | |
| **7.30 PM onwards** | Dinner | |
| **DAY 2: MARCH 22, 2023 (WEDNESDAY)** | | |
| **10.00 - 12.00 PM** | **Plenary Session 2 - Blended Learning Through the Lens of Emerging Technologies** | |
| **Co-Chairs** | **Dr. P.L. Gautam**<br>Former Vice Chancellor, GBPUAT, Pantnagar<br>**Dr. Tilak Raj Sharma**<br>DDG (Crop Science), ICAR, New Delhi | |
| **Convener** | **Dr. Hema Tripathi**<br>National Coordinator (M&E and ESS), PIU, NAHEP, ICAR, New Delhi | |
| **Rapporteurs** | **Dr. Sanchita Naha and Ms. Madhu**<br>ICAR-IASRI, New Delhi | |
| **10.00 - 10.20 AM** | **Keynote Lecture 1**<br>NAHEP - Blended Learning Platform and associated IT Initiatives | **Dr. Sudeep Marwaha**<br>Principal Scientist, ICAR – IASRI, New Delhi |
| **10.20 - 10.40 AM** | **Keynote Lecture 2**<br>Flipped Classroom Model for Effective Self-Paced Learning in Veterinary education | **Dr. Surinder Singh Chauhan**<br>Senior Lecturer Animal Science, School of Agriculture and Food, The University of Melbourne, Australia |
| **10.40 – 11.00 AM** | **Keynote Lecture 3**<br>Integrating Innovation and Entrepreneurship in Agricultural Education | **Dr. Perry Den Brok**<br>Professor, Department of Social Sciences, Wageningen University, Netherlands (Online) |
| **11.00 - 11.20 AM** | **Keynote Lecture 4**<br>Blended Learning and Emerging Artificial Intelligence (AI) Technologies | **Dr. Glen C. Shinn**<br>Professor Emeritus, Department of Agricultural Leadership, Education and Communications Texas A&M University, USA (Online) |
| **11.20 - 11.40 AM** | **Keynote Lecture 5**<br>How Virtual Reality is Changing Education and Research | **Mr. Harshavardhana Kikkeri**<br>Founder and CEO, Holosuit Pte Ltd, Canada (Online) |
| **11.40 - 12.00 PM** | **Discussion and Co-Chair Remarks** | |
| **12.00 – 12.30 PM** | **High Tea** | |
| **12.30 – 1.50 PM** | **Panel Discussion – 2: Making Agricultural Education Future Ready with 3 Es: Emerging Technologies, Employability and Entrepreneurship** | |
| **Co-Chairs** | **Dr. S.K. Chaudhuri**<br>DDG (Natural Resource Management), ICAR, New Delhi<br>**Dr. Dheer Singh**<br>Vice Chancellor & Director, ICAR-National Dairy Research Institute (NDRI), Karnal | |

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|---|---|
| **Convener** | **Dr. P. Ramasundaram**<br>National Coordinator (IDP), PIU, NAHEP, ICAR, New Delhi |
| **Moderator** | **Mr. Guna Nand Shukla**<br>Director, PricewaterhouseCoopers (PwC), New Delhi |
| **Rapporteurs** | **Dr. Md. Ashraful Haque and Ms. Sapna Nigam**<br>ICAR-IASRI, New Delhi |
| | **Panelists** |
| | 1. **Dr. Bidyut C. Deka**<br>Vice Chancellor, Assam Agricultural University (AAU), Jorhat<br>2. **Dr. Nazir Ahmad Ganai**<br>Vice Chancellor, Sher-E-Kashmir University of Agriculture Science & Technology-of Kashmir (SKUAST-K), Kashmir<br>3. **Prof. Atul Khosla**<br>Founder and Vice Chancellor, Shoolini University, Himachal Pradesh<br>4. **Dr. Sudha Rao (Rtd.)**<br>Executive Director, Karnataka knowledge commission, Bangalore<br>5. **Dr. Inu Rana**<br>Sr. Business Advisor, Western Sydney University, Australia (Online)<br>6. **Dr. Perry Den Brok**<br>Professor, Department of Social Sciences, Wageningen University, Netherlands (Online)<br>7. **Dr. David Kraybill**<br>Professor Emeritus, Ohio State University, Washington DC, USA (Online) |
| **1.50 – 2.00 PM** | **Discussion and Co-Chair Remarks** |
| **2.00 – 3.00 PM** | **Lunch** |
| **3.00 – 4.20 PM** | **Panel Discussion – 3: Accelerating Digital Development Through Effective Capacity Building and Change Management** |
| **Co-Chairs** | **Dr. V Geethalakshmi**<br>Vice Chancellor, Tamil Nadu Agricultural University |
| **Convener** | **Dr. Alka Arora**<br>Head (A), Computer Application, ICAR–IASRI, New Delhi |
| **Moderator** | **Mr. Amit Vatsyayan**<br>Social and Skills, Partner, Ernst & Young LLP (EY), New Delhi |
| **Rapporteurs** | **Dr. Chandan Kumar Deb and Mr. Samarth Godara**<br>ICAR-IASRI, New Delhi |
| | **Panelists** |
| | 1. **Dr. Satender Singh Arya**<br>CEO, Agriculture Skill Council of India, New Delhi<br>2. **Dr. Gopesh Tiwari**<br>Head of Education, International Rice Research Institute, Los Baños, Calabarzon, Philippines<br>3. **Dr. Douglas L. Steele**<br>Vice President, Food Agriculture and Natural Resources, Association of Public and Land-grant Universities |

| | | |
|---|---|---|
| | **4. Dr. Ch. Srinivasa Rao**<br>Director, ICAR-National Academy of Agricultural Research Management (NAARM), Hyderabad<br>**5. Dr. Yanko Fernando Michea**<br>Director, Learning and Information Technologies, College of Education, University of Washington, USA | |
| | **6. Dr. Sajid Pareeth**<br>Senior Lecturer, IHE Delft Institute for Water Education, Netherlands<br>**7. Mr. Sudhir Agrawal**<br>Director and Faculty - Digital Transformation, Wadhwani Foundation, New Delhi | |
| **4.20 – 4.30 PM** | **Discussion and Co-Chair Remarks** | |
| **4.30 – 5.00 PM** | **High Tea** | |
| **5.00 – 6.00 PM** | **Plenary Session 3 - Models and Studies on Blended Learning Ecosystem** | |
| **Chair** | **Dr. A.K. Singh**<br>Vice Chancellor, Rani Lakshmi Bai Central Agricultural University, Jhansi | |
| **Convener** | **Dr. Shanti Kumar Sharma**<br>ADG (HRM), Agricultural Education Division, ICAR | |
| **Rapporteurs** | **Mr. Akshay Dheeraj and Ms. Madhu**<br>ICAR-IASRI, New Delhi | |
| **5.00 - 5.20 PM** | **Case Study**<br>Change leadership for blended learning in higher education: the case of Malawi, the Warm Heart of Africa | **Dr. Joshua Valeta**<br>Director, Open, Distance and e-Learning, Ministry of Education, Malawi Government, Malawi |
| **5.20 - 5.40 PM** | **Keynote Lecture 1**<br>Digital tools & E.N.H.A.N.C.E. Learning Model | **Dr. Morris Thomas**<br>Assistant Provost, Digital and Online Learning & Director of the Center for Excellence in Teaching, Learning, and Assessment, Howard University, Washington, USA |
| **5.40 - 6.00 PM** | **Keynote Lecture 2**<br>Economic returns to agricultural research and development | **Dr. Evgueni Poliakov**<br>Founder, Netherlands Economic Observatory, Netherlands |
| **6.00 - 6.10 PM** | **Discussion and Co-Chair Remarks** | |
| **7.00 PM onwards** | **Cultural Program and Dinner** | |
| **DAY 3: MARCH 23, 2023 (THURSDAY)** | | |
| **10.00 - 11.30 AM** | **Plenary Session 4 - Sustainable Digital Transformation in Education System** | |
| **Co-Chairs** | **Dr. Joykrushna Jena**<br>DDG (Fisheries Science), ICAR, New Delhi | |
| **Convener** | **Dr. Shashi Dahiya**<br>Principal Scientist, ICAR – IASRI, New Delhi | |
| **Rapporteurs** | **Dr. Soumen Pal and Ms. Sapna Nigam**<br>ICAR-IASRI, New Delhi | |

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| **10.00 - 10.20 AM** | **Keynote Lecture - 1**<br>New Education Technology in Agricultural Education | **Dr. Alex Twinomugisha**<br>Senior Education Technology Specialist, The World Bank, Washington, USA (Online) |
| **10.20 - 10.40 AM** | **Keynote Lecture - 2**<br>Digital Disruption for Sustainable Agriculture | **Mr. Sudhir Kadam**<br>Venture Partner, and Corporate Innovation Strategist, Mountain View, California, USA |
| **10.40 - 11.00 AM** | **Keynote Lecture - 3**<br>Blended learning for higher education in the post pandemic era | **Dr. Sidas Saulynas**<br>Lecturer, UMBC, Information Systems Department, Maryland, USA |
| **11.00 - 11.20 AM** | **Keynote Lecture - 4**<br>Seeking a Sustainable Digital Learning Model After the Pandemic | **Dr. Yanko Fernando Michea**<br>Director, Learning and Information Technologies, College of Education, University of Washington, USA |
| **11.20 - 11.30 AM** | **Discussion and Co-Chair Remarks** | |
| **11.30 – 12.00 PM** | **High Tea** | |
| **12.00 – 1.20 PM** | **Panel Discussion – 4: Digital Transformation in Education Sector** | |
| **Co-Chairs** | **Dr. Udham Singh Gautam**<br>DDG (Agricultural Extension), ICAR, New Delhi<br>**Dr. Triveni Dutt**<br>Vice Chancellor & Director, ICAR-Indian Veterinary Research Institute (IVRI), Bareilly | |
| **Convener** | **Dr. Anshu Bharadwaj**<br>Principal Scientist, ICAR-IASRI, New Delhi | |
| **Moderator** | **Mr. Vikas Aggarwal**<br>Partner, Consulting, EY LLP, New Delhi | |
| **Rapporteurs** | **Dr. Sanchita Naha and Ms. Madhu**<br>ICAR-IASRI, New Delhi | |
| | **Panelists** | |
| | 1. **Dr. Rajender Parsad**<br>Director, ICAR-IASRI, New Delhi<br>2. **Mr. Werner Wutscher**<br>Former Secretary General, Federal Ministry for Agriculture, Environment, Forestry, and Water Management, Austria<br>3. **Mr. Vikas Kanungo**<br>Sr. Digital Development Specialist, The World Bank, New Delhi<br>4. **Mr. Gaurav Gupta**<br>Chief Growth Officer, EkStep Foundation, Bangalore<br>5. **Dr. Poorna Gunasekera**<br>Associate Dean International, Peninsula Medical School University of Plymouth, United Kingdom<br>6. **Dr. Balakrishnan Prithiviraj**<br>Associate Vice President (Global Relations), Dalhousie University, Halifax, Canada (Online) | |

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| **1.20 – 1.30 PM** | **Discussion and Co-Chair Remarks** | |
| **1.30 – 2.30 PM** | **Lunch** | |
| **2.30 – 3.40 PM** | **Plenary Session 5 - Blended Learning Ecosystem and Community Outreach** | |
| **Co-Chairs** | **Dr. Bhupendra Nath Tripathi**<br>DDG (Animal Science), Division of Animal Science, ICAR<br>**Dr. Rajender Parsad**<br>Director, ICAR-IASRI, New Delhi | |
| **Convener** | **Dr. Ajit**<br>Principal Scientist, ICAR-IASRI, New Delhi | |
| **Rapporteurs** | **Dr. Soumen Pal and Dr. Chandan Kumar Deb**<br>ICAR-IASRI, New Delhi | |
| **2.30 – 2.50 PM** | **Keynote Lecture - 1**<br>Making the most of the Digital in a Blended Learning Ecosystem | **Ms. Denise Whitelock**<br>Director, Open University, United Kingdom (Online) |
| **2.50 - 3.10 PM** | **Keynote Lecture - 2**<br>How Higher Education can be Connected to Community Needs in NEP 2020 | **Dr. Virendra Kumar Vijay**<br>National Coordinator, Unnat Bharat Abhiyan, Ministry of Education, GOI |
| **3.10 - 3.30 PM** | **Keynote Lecture - 3**<br>Indian Open Data Platform Outreach -Stakeholder Outreach on Higher Education | **Dr. Alka Mishra**<br>Deputy Director General, National Informatics Centre, MeiTy, New Delhi |
| **3.30 – 3.40 PM** | **Discussion and Co-Chair Remarks** | |
| **3.40 – 4.15 PM** | **High Tea** | |
| **4.15 – 6.00 PM** | **Valedictory Session** | |
| **Welcome and Overview** | **Dr. R.C. Agrawal**<br>DDG (Agricultural Education) & ND, NAHEP, ICAR, New Delhi | |
| **Special Remarks by Guest of Honour** | **Dr. Auguste Tano Kouame**<br>Country Director, The World Bank, The World Bank, Washington, USA | |
| | **Dr. Shailesh Kumar Mishra**<br>Director (Extension), Ministry of Agriculture and Farmers Welfare, GOI | |
| | **Dr. Trilochan Mohapatra**<br>Former Secretary, DARE and DG, ICAR, Ministry of Agriculture and Farmers Welfare, GOI | |
| **Chairpersons Remarks** | **Dr. Himanshu Pathak**<br>Secretary, DARE and DG, ICAR, Ministry of Agriculture and Farmers Welfare, GOI | |
| **Delhi Declaration on Modernization of Agricultural Education System Aligning with NEP 2020** | | |
| **Chief Guest Remarks** | **Dr. R. B. Singh**<br>Former Chancellor, Central Agricultural University (CAU), Imphal, Former Chairman ASRB, and Former President NAAS, New Delhi | |
| **Vote of Thanks** | **Dr. Anuradha Agrawal**<br>National Coordinator, NAHEP (Component 2 and CAAST), ICAR, New Delhi | |

"Blended learning is a powerful approach to education that combines the best of traditional classroom teaching with the latest in technology to create an engaging and personalized learning experience for students."

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