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# International Conference on Blended Learning Ecosystem for Higher Education in Agriculture

10 – 12 October 2022

 <https://ICBLE2022.krishimegh.in/>

Indian Council of Agricultural Research, New Delhi, India

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**International Conference on  
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# Overview

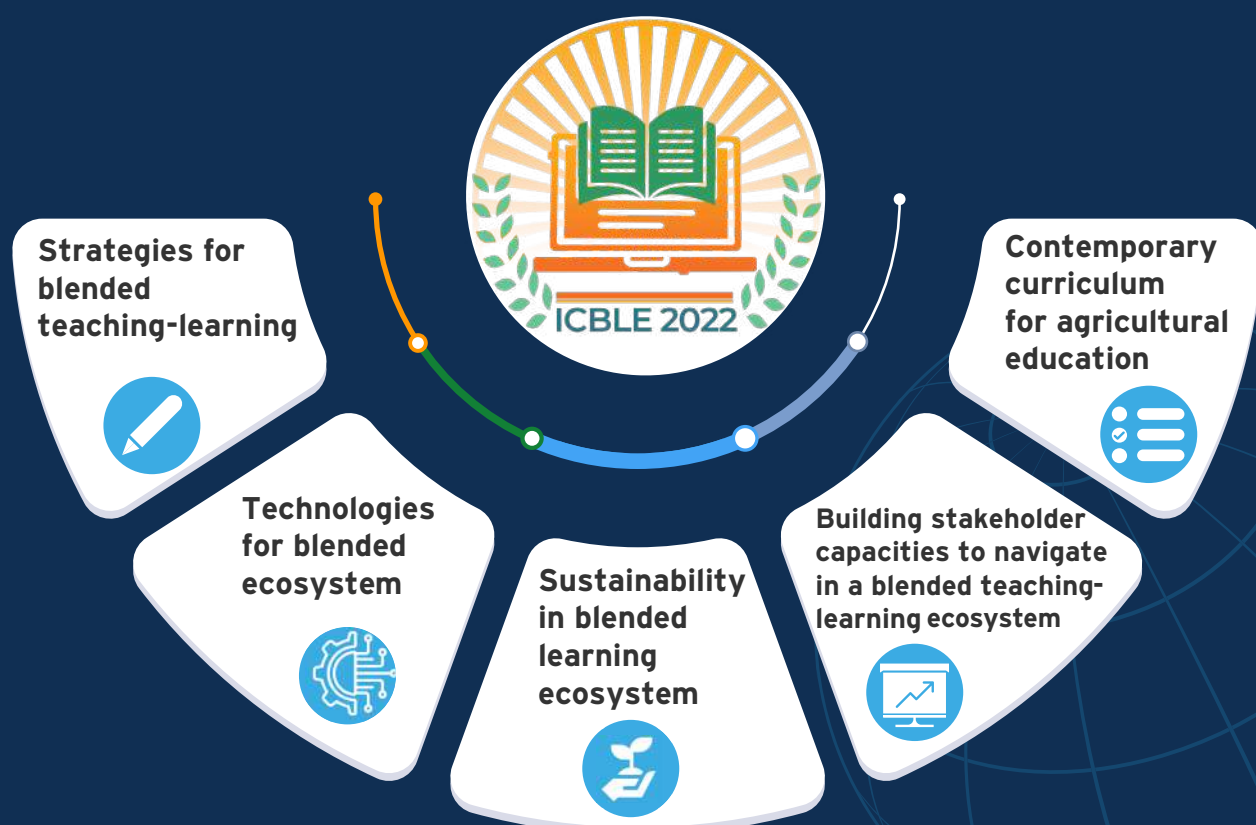
A strong higher education system is a key prerequisite to achieve sustainable economic development. This necessitates building education systems on the foundation of four key education resilience approaches viz. manage and minimize adversity in education; use and protect positive engagement and assets 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 October 2022. 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).



# Introduction

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“

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.

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<sup>3</sup>The details of the PM e-Vidya Component is available at <https://pmmodiyojana.in/pm-evidya/>.

<sup>4</sup>[www.icar.org.in](http://www.icar.org.in)

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**"<sup>2</sup>.

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**<sup>3</sup> 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)<sup>4</sup>, 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.

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<sup>1</sup>Detailed Document on National Education Policy 2020 is available at the URL [https://www.education.gov.in/sites/upload\\_files/mhrd/files/NEP\\_Final\\_English\\_0.pdf](https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf)

<sup>2</sup>International Commission on the Futures of Education. 2020. Education in a post-COVID world: Nine ideas for public action. Paris, UNESCO



# 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 primarily entail:

- 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 centralised design by ICAR and decentralised 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.

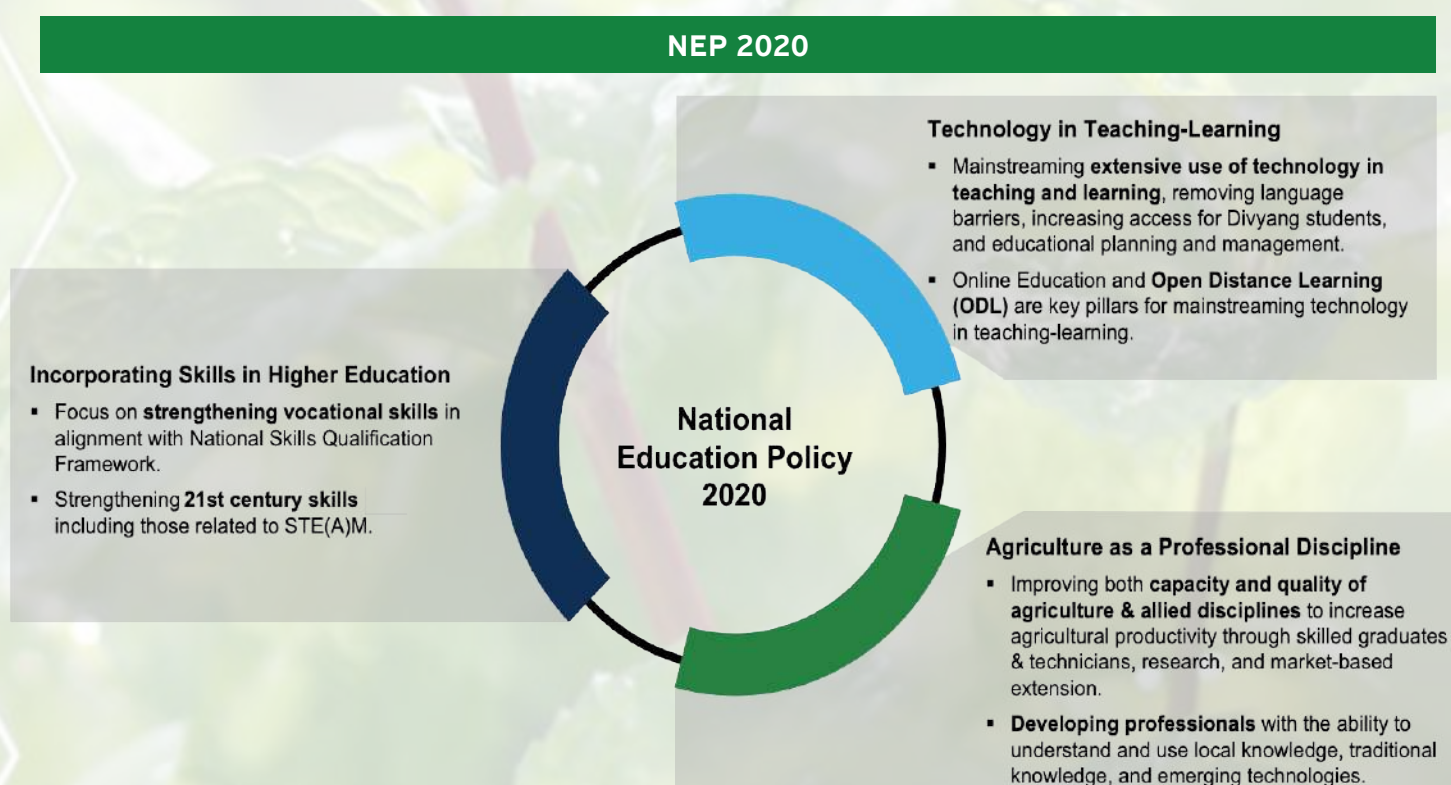
”

**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 2020<sup>5</sup>

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.



<sup>5</sup>[https://www.education.gov.in/sites/upload\\_files/mhrd/files/NEP\\_Final\\_English\\_0.pdf](https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf)



## 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



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 Centres 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.



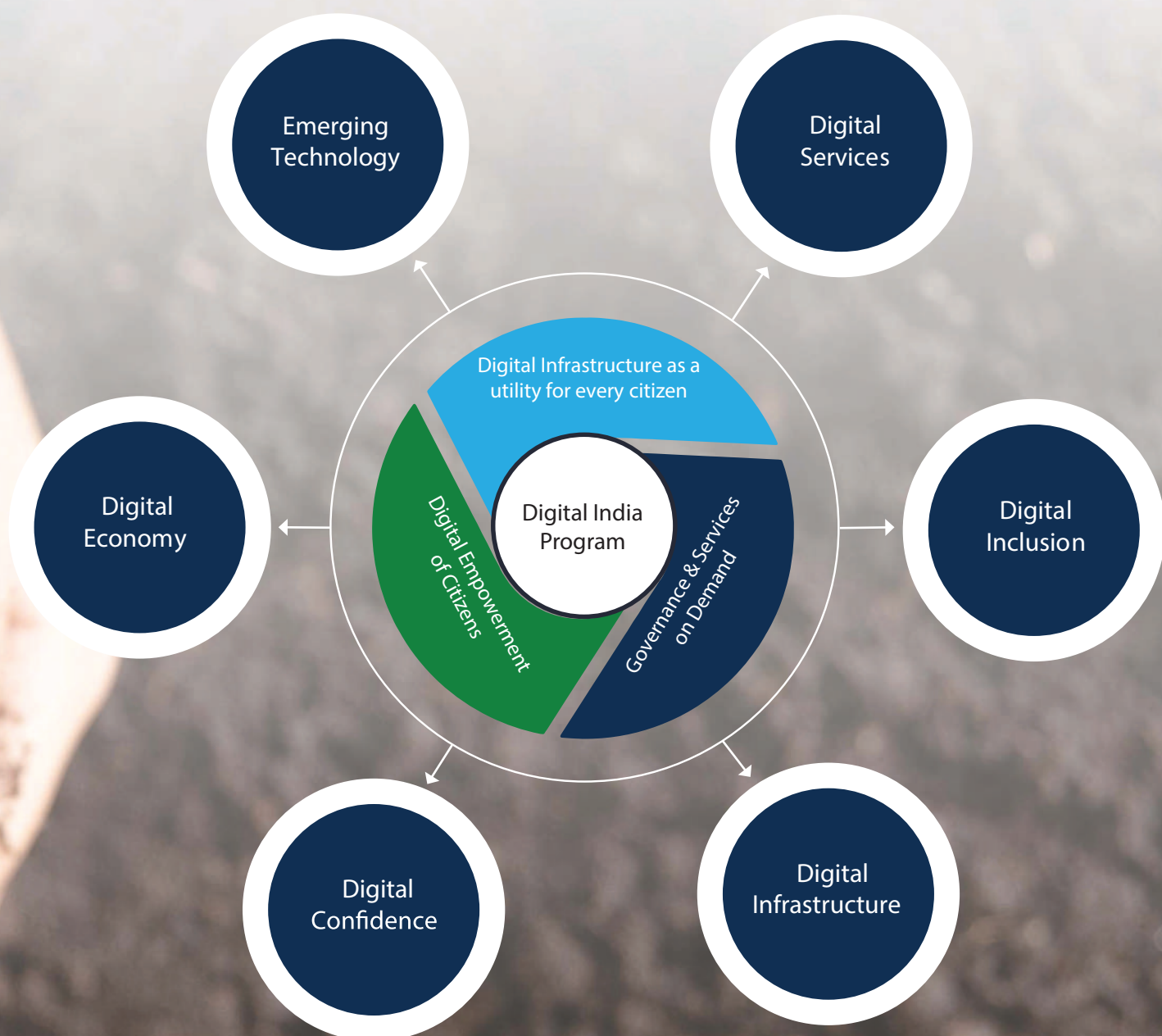


## c) Digital India 2.0

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 India for the knowledge-based transformation and delivering good governance to citizens by synchronized and coordinated implementation at both Central Government and State Government levels through Central, state, and integrated mission mode projects.

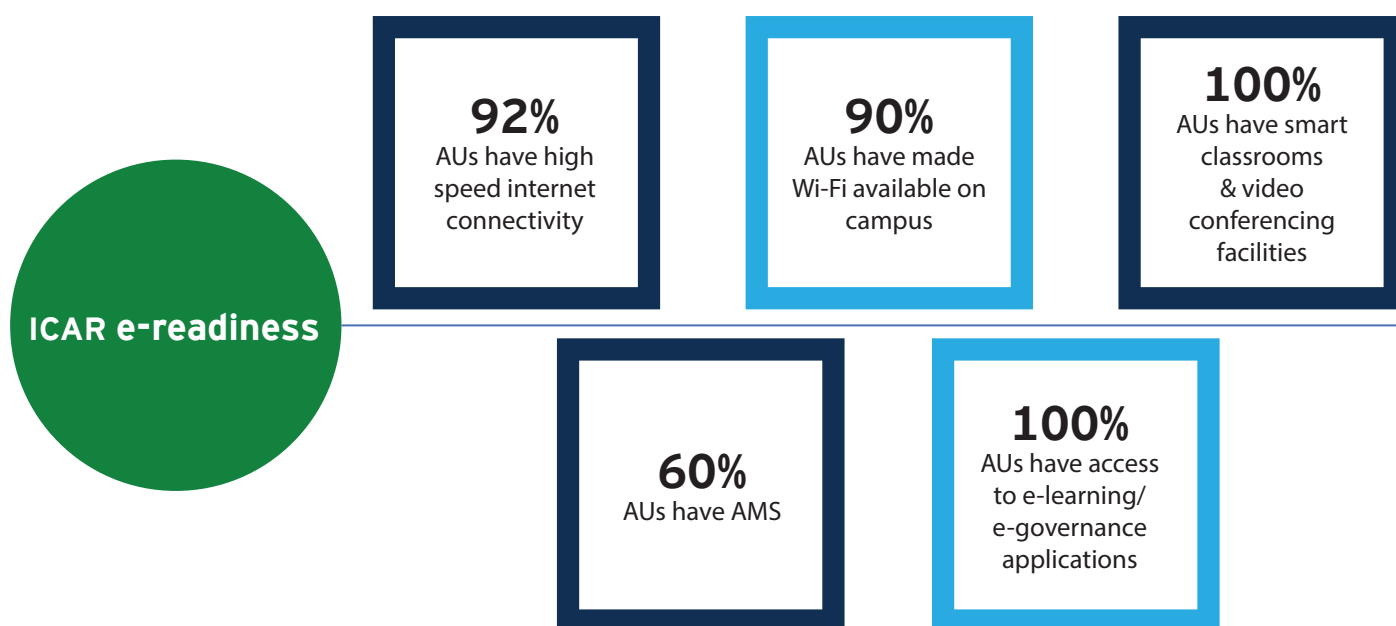
Digital India 2.0, emerging from Digital India Program aims at providing electronic public services in both rural and urban areas.

### Digital India 2.0



## 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

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

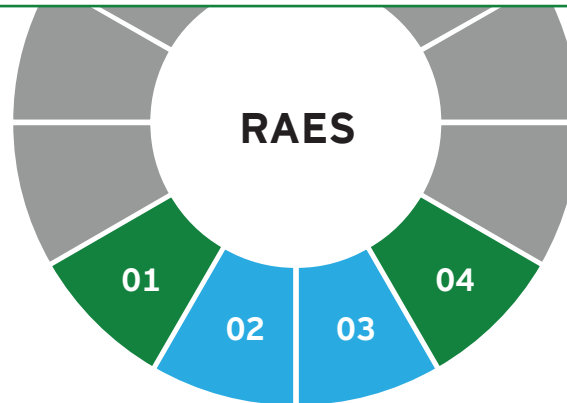
”

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

\* The data was collected through survey conducted by ICAR



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

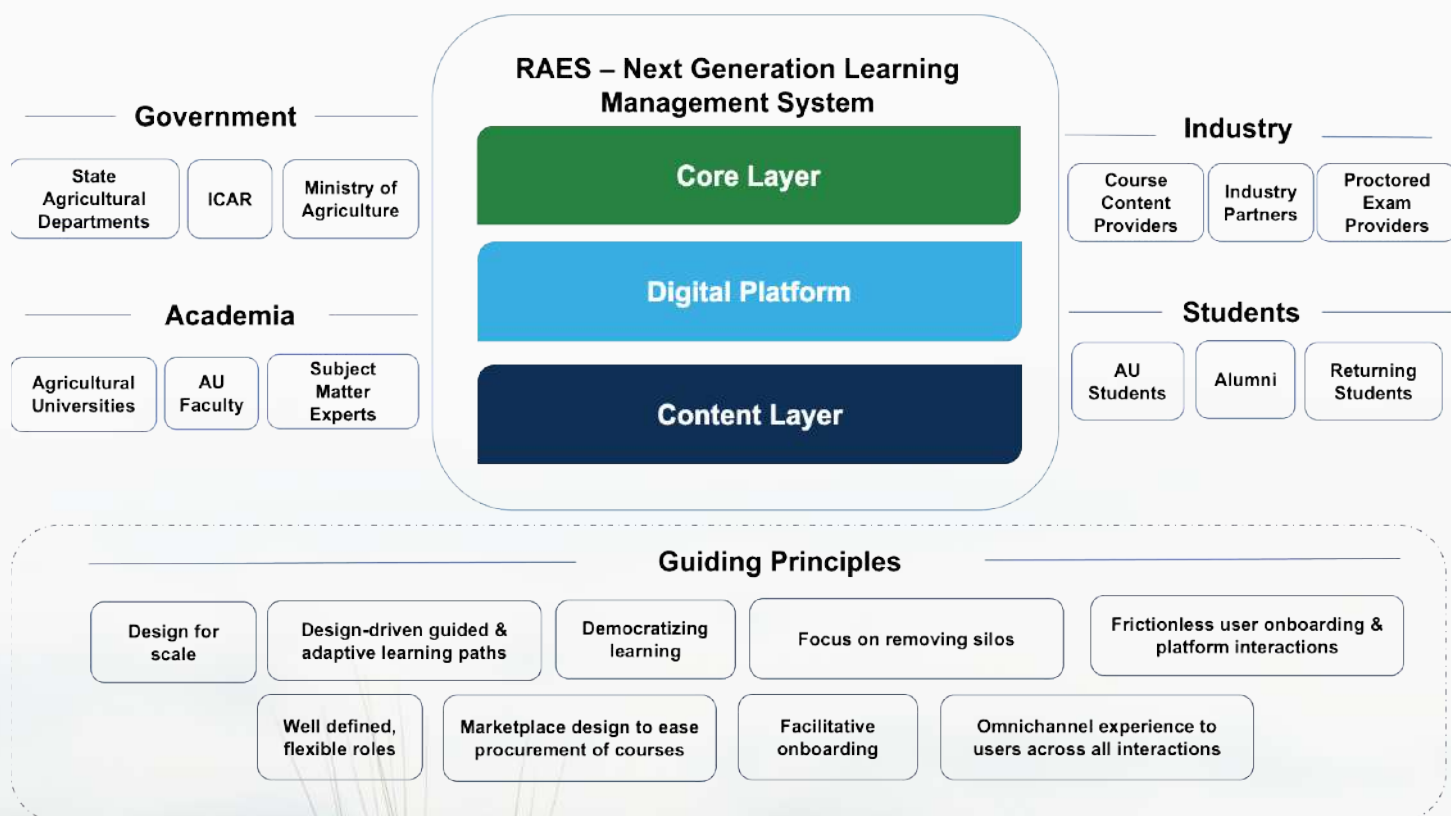
“

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:



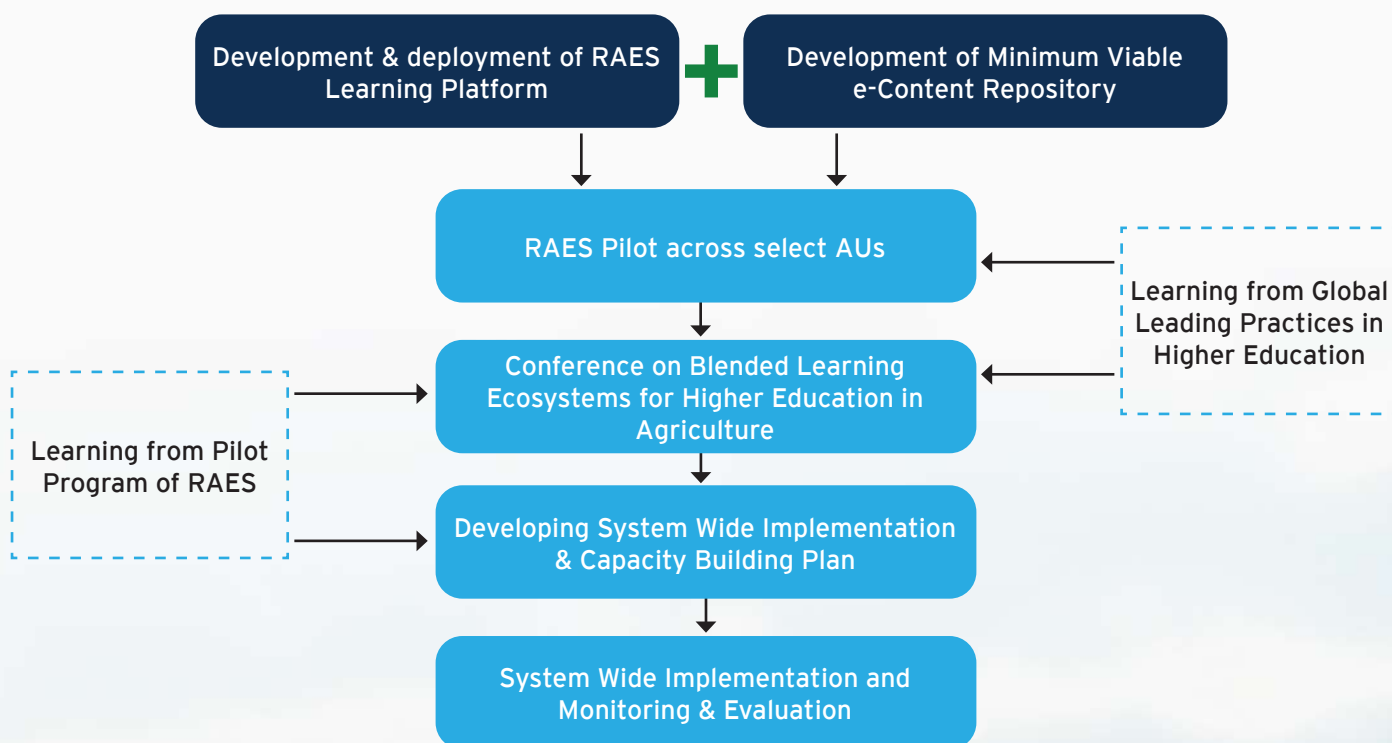
“Universities have come to realize that online is not a fad. The question is not whether to engage in this area but how to do it.”

Daphne Koller (Co-Founder, Coursera)



## 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.

## International Conference on “BLENDED LEARNING ECOSYSTEM FOR HIGHER EDUCATION IN AGRICULTURE”

The International Conference on Blended Learning Ecosystem will be hosted by ICAR and the World Bank. The event is organized by ICAR-IASRI, which is envisaged as a multi-partner global forum to support collaboration for development of state-of-the-art blended education system for higher agricultural education and formulation of strategies for accelerating the deployment of RAES.

It is envisioned that conference deliberations and discussions, coupled with the learnings from the RAES pilot, would be utilized towards strengthening the quality of the full-scale implementation program. Moreover, the amalgamation of leading practices as identified during the conference and pilot would serve as a knowledge public good, to be utilized by various education systems to adapt and emulate in their own countries. To this end, the main focus areas of the conference are:

- Strengthening and deepening the collaboration among multiple implementing agencies working in the domains of remote learning, digital education, and blended education systems.
- Fostering knowledge sharing among practitioners of different verticals & flagship programs such as Digital India, Digital Education, MOOCs, and Skill India to ensure adherence to global standards and leading practices for accelerated deployment of RAES with the objective of minimizing the “digital divide” across the various categories of users / stakeholders.
- Deliberating upon the sustainability of the RAES programme through public-private partnerships (PPPs) and alignment with market need / demand.

- Support deliberations among multiple players to formulate structured mechanisms for improving cross-sectoral integration to accelerate development of governance framework and deployment of digital infrastructure for cyber-physical integration under RAES initiative.
- Facilitate sharing of good practices among the ICAR, Agricultural Universities and other stakeholders for development and deployment of digital platforms and blended learning strategies for transformative interventions across infrastructure, content, and capacity building domains.
- Understanding leading global practices in designing and deploying agricultural education, specifically at the higher education level. Additionally, co-designing frameworks to assess global equivalency of agricultural education curriculum.



## Thematic Areas

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.

- ▶ **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**

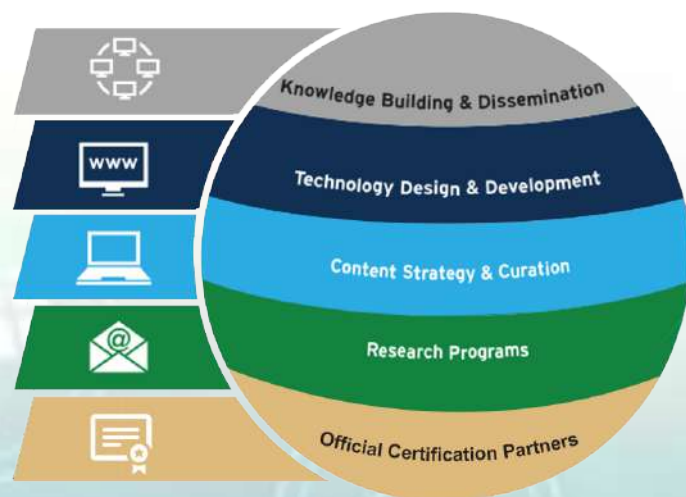
Thematic Areas	Objectives	Key Questions	Audience	Takeaways
<b>Strategies for blended teaching-learning</b>	<ul style="list-style-type: none"> <li>• Explore the various strategies being deployed globally to strengthen teaching-learning outcomes in a blended delivery ecosystem, while incorporating “skills-based education”</li> <li>• Explore monitoring methods to address the issue of “digital among various users</li> </ul>	<ul style="list-style-type: none"> <li>• What are the key sourcing strategies for content &amp; technology?</li> <li>• What implementation strategies have emerged in blended ecosystems?</li> <li>• What are the monitoring strategies being adopted in blended ecosystem?</li> </ul>	<ul style="list-style-type: none"> <li>• Faculty</li> <li>• Administration</li> <li>• Industry Leaders</li> <li>• Thought Leaders</li> </ul>	Identification of leading models for blended teaching-learning in Indian Agricultural Higher Education



Thematic Areas	Objectives	Key Questions	Audience	Takeaways
<b>Technologies for blended ecosystem</b>	<ul style="list-style-type: none"> <li>Present the various technologies currently being utilized towards operationalizing blended learning in the global higher education context</li> <li>Understand progress of the “platform-based approach” in higher education</li> </ul>	<ul style="list-style-type: none"> <li>What leading digital tools are being used for blended teaching-learning, globally?</li> <li>What innovative technology models have emerged in blended learning ecosystems?</li> <li>What are the leading practices w.r.t. scalable technology interventions?</li> <li>What models of environment sustainability are being adopted in blended ecosystems?</li> </ul>	<ul style="list-style-type: none"> <li>Faculty</li> <li>Students</li> <li>Technology Partners</li> <li>Multilateral Organizations</li> <li>Bilateral Organizations</li> </ul>	Identification of suitable technologies and tools for blended teaching-learning for agricultural higher education
<b>Sustainability in blended learning ecosystem</b>	<ul style="list-style-type: none"> <li>Explore various methods to sustain blended learning environments in the long run</li> <li>Discuss significance of partnerships between industry &amp; Government to support experiential learning, industry certifications, commercial sustainability, etc.</li> </ul>	<ul style="list-style-type: none"> <li>How are blended learning ecosystems being governed? What are some models?</li> <li>How are organizations modelling financial sustainability of blended learning tools &amp; technologies?</li> <li>Which are beneficial partnerships – Industry, Civil Society Organizations (CSO) etc?</li> </ul>	<ul style="list-style-type: none"> <li>Industry Leaders</li> <li>Faculty</li> <li>Administration</li> <li>Bilateral Organizations</li> </ul>	Identification of relevant sustainability models across governance, finance and partnerships
<b>Building stakeholder capacities to navigate in a blended teaching-learning ecosystem</b>	<ul style="list-style-type: none"> <li>Identify various skills required by stakeholders to sustain momentum of blended teaching-learning</li> <li>Explore large scale adult capacity building programs</li> </ul>	<ul style="list-style-type: none"> <li>What are leading models in scale adult capacity building e.g. reinforcement models?</li> <li>How can momentum in capacity building be maintained through rewards &amp; recognition e.g. mentorship?</li> <li>What is leading monitoring &amp; impact assessment tools used in large capacity building programs?</li> </ul>	<ul style="list-style-type: none"> <li>Administration</li> <li>Faculty</li> <li>Students</li> <li>Civil Society Organizations (CSO)</li> <li>Bilateral Organizations</li> </ul>	Identification of leading models of adult capacity building that can be adapted in the agricultural higher education context
<b>Contemporary curriculum for agricultural education</b>	<ul style="list-style-type: none"> <li>Discussion on global leading practices in development of curriculum for agricultural education</li> <li>Analysing frameworks to assess equivalency of Indian agricultural curriculum with leading global agricultural curriculum providers</li> </ul>	<ul style="list-style-type: none"> <li>What are the leading global practices in the area of curriculum development for agricultural education?</li> <li>How can academic equivalency be maintained globally, in the context of agricultural higher education</li> <li>What are some of the leading methods that allow for continuous upgradation of curriculum to keep it contemporary and relevant, particularly in the context of rapid scientific and technological developments?</li> </ul>	<ul style="list-style-type: none"> <li>Faculty</li> <li>Students</li> <li>Industry partners</li> <li>Multilateral Organizations</li> <li>Bilateral Organizations</li> <li>Administration</li> </ul>	Identifying leading practices in curriculum development in Agri education Identify and co-design frameworks for enabling global equivalency in Agri education

## 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



**भारतीय कृषि अनुसंधान परिषद**  
**Indian Council of Agricultural Research**  
(Ministry of Agriculture and Farmers Welfare)

The Indian Council of Agricultural Research (ICAR) is an autonomous organisation 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 co-ordinating, 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 foodgrains 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



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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>



**भा.कृ.अनु.प.-भारतीय कृषि सांख्यिकी अनुसंधान संस्थान**  
**ICAR- Indian Agricultural Statistics Research Institute**

ICAR-IASRI is a pioneer and premier Institute of ICAR to undertake research, teaching and training in Agricultural Statistics, Computer Application and Bioinformatics since its inception way back in 1930. The institute has six divisions namely Design of Experiments, Statistical Genetics, Forecasting and Agricultural Systems Modelling, Sample Surveys, Computer Applications, Agricultural Bioinformatics etc. The Institute conducts degree courses for M.Sc. and Ph.D. in Agricultural Statistics, Computer Application and Bioinformatics in collaboration with IARI, New Delhi.

Source: <https://iasri.icar.gov.in/about-iasri/>

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