



Capacity Building by ICAR

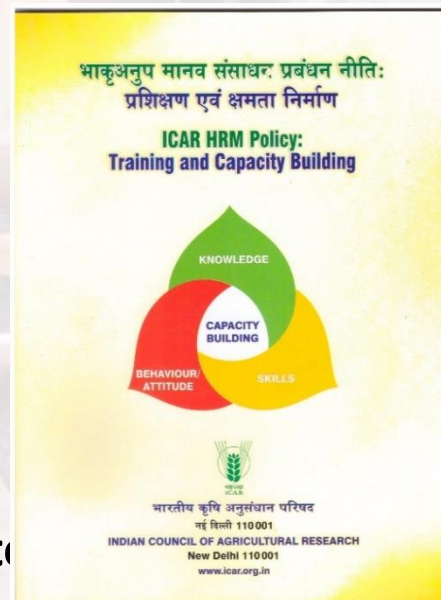


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ICAR HRM Policy: Training and Capacity Building



- Formulated and being implemented in ICAR w.e.f. 1st April, 2018
- Based on the National Training Policy - 2012 of GoI.
- Focuses on “competency-based training for all”
- Guides on:
 - Competency framework
 - Objectives and nature of training
 - Role of ICAR and training institutions
 - Trainer development
 - Foreign training
 - Implementation, coordination, monitoring



<https://hrm.icar.gov.in/data/ICAR-HRM-policy-2018.pdf>

Adopted Systematic Approach to Training



Implementation of Systematic Approach to Training

Development of Annual Training Plan (ATP) based on Training Need Assessment (TNA)

- Developing ATP based on TNA is necessary as per National Training Policy of GOI and ICAR HRM Policy: Training and Capacity Building.
- First time in ICAR, all ICAR-Institutes/HQs have been developing ATP based on TNA for all categories of employees since 2016-17.
- All ICAR-Institutes submit ATPs through Online TMIS since 2019-20.
- Individual Employee ➡ Reporting Officer ➡ HRD Nodal Officer ➡ Reviewing Officer ➡ Training Manager

Training Need Areas for Scientific Staff

S. No.	Identified Deficient area for training	No. of Scientists
1	Genomics and Functional Genomics	204
2	Bioinformatics	170
3	Research Management	167
4	Molecular Breeding Techniques	106
5	Statistical Data Analysis and Experimental Design	103
6	Leadership Development and Managerial Skills	92
7	Impact Assessment	78
8	Proteomics	74
9	Metabolomics	69
10	Nanotechnology	61
11	Next Generation Sequencing	53
12	Conservation Agriculture	52
13	Writing and Communication Skills	51
14	Marker Assisted Selection	44
15	Simulation Modeling	42
16	Pesticide Residue Analysis	39
17	Phenomics	38
18	Transgenics	38
19	Instrumentation Techniques	33
20	Metagenomics	33

21	Bio-control Agents	33
22	IPR Issues	32
23	Germplasm Characterization and Conservation	32
24	Taxonomy	32
25	Packaging Tools & Techniques	30
26	Human Resource Management	28
27	Computer Applications	27
28	Stress Management	27
29	Gender Issues and Mainstreaming	27
30	Decision Support System	27
31	PME Management	27
32	Precision Farming	26
33	Climate Change related issues	24
34	Biotechnological Tools and Approaches	24
35	C-sequestration	24
36	Mass Spectrometry Techniques	24
37	Project Management	23
38	Nutraceutical and Functional Foods	22
39	Functional Genomics	22
40	Scientific Writing and Editing	22
41	GIS Applications	21
42	Farming System Research and Modeling	20
43	Tissue Culture	19
44	Molecular Biological Techniques	18
45	Protected Cultivation	17

46	Stem Cell Technology	17
47	Advances in Crop Production	17
48	Isolation, Identification and Mass Multiplication of Native Bio-control Agents	16
49	Supply/Value Chain Management	16
50	Water and Nutrient Use Efficiency	15
51	Econometrics	15
52	Biodiversity Conservation and Management	15
53	Use of HPLC,GC-MS, LCMS, etc.	15
54	Seed Quality Issues	15
55	Advances in Organic Farming	14
56	Biotic and Abiotic Stress Management	14
57	Hyperspectral Remote Sensing and Thermal Imaging	14
58	Database Management &Digitization	14
59	Research Methodology	14
60	Genetic Resource Management	14
61	Nutrigenomics	14
62	Computational Biology	14
63	Phenotyping and related issues	14
64	Advances in Horticulture	13
65	Software Applications	13

66	PHT	13
67	Allele Mining	13
68	Advances in Modeling and Climate Change Studies	12
69	Entrepreneurship Development	12
70	Advances in Breeding Techniques	12
71	Bio-safety Issues	12
72	Gene Expression Regulation and Silencing	12
73	SNP Genotyping	12
74	ICT Applications	11
75	Double Haploid Production	11
76	Haploid and related issues	11
77	Electron Microscopy	11
78	Advances in Water Management in Crops	11
79	Soil & Water Conservation and Watershed Management	11
80	Advanced Soil Survey Techniques	11
81	Microscopy Techniques	10
82	High Throughput Analysis	10
83	Transcriptomics	10
84	Epidemiology and Disease Surveillance	10
85	Biosensor Applications	10
86	Extension Methodologies	10
87	Web Page Development	10
88	Knowledge Management	9
89	Extension Methodologies	9
90	CAD	9
91	FMS/MIS	8
92	DNA Barcoding and Fingerprinting	8
93	Fermentation Technology	8
94	Disease Forecasting	8
95	Chemical Ecology and related aspects	8

96	Root Architecture and related aspects	8
97	Entrepreneurship Development	8
98	Genome Wide Association Studies (GWAS)	8
99	Advances in Animal Disease Management	8
100	Sensor Technology-Design and development	7
101	Omics	7
102	Writing Case Studies	7
103	Diagnostic Tools and Techniques	7
104	Environmental Impact Assessment	7
105	Cage &Pen culture	7
106	Livestock Production and Management	7
107	Micro Array Techniques	7
108	Advances in Toxicology	6
109	Recent Advances in Determination of Soil Contaminants	6
110	Biopesticides	6
111	Artificial Neural Network	6
112	Association Mapping	6
113	RNA Sequencing and Data Analysis	6
114	Identification of Insects Pests	6
115	Advances in Fruit Breeding	6
116	Use of CRISPR/CAS Technology for Genome Editing in Plants	6
117	Biomass Energy for Future	6
118	Computer Applications in Agriculture	5
119	Working Knowledge in Hindi	5
120	SCUBA Diving	5
121	Use of Advance Instruments in Nanotechnology	5
122	Carbon Footprints in Agriculture	5
123	GHG Emission and Estimation	5
124	Biodiversity Conservation & Management	5
125	Drought Tolerance	5
126	Fish Taxonomy	5
127	Ecological Modeling	5
128	Artificial Intelligence	5

Domains Of Agricultural Universities in India



Doctoral Programs

80

PG Level Subjects

95

UG Level
Subjects

11

Domain of AU	Number
SAUs	39
Veterinary Universities	15
Horticulture Universities	06
Fisheries Universities	03
Deemed Universities	04
CAUs	03
CUs with Agricultural Faculties	04



Requirement of students in ICAR- AU system as per ideal Faculty Student ratio



How to meet ideal Faculty student ratio (1:10)?

Assumption- Number of in-position faculties have been kept constant

Parameters	SAU			CAU			ICAR			Overall		
	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Existing students' strength in AU (Average per AU)	2,028	2,186	2,315	1,543	1,745	2,133	747	1,489	842	1,935	2,131	2,222
Existing Faculty student ratio	1:7	1:8	1:8	1:4	1:6	1:6	1:4	1:5	1:4	1:7	1:7	1:8
Additional students which can be accommodated to meet the ideal FS ratio (average per AU)	1,067	898	814	1,823	1,231	1,402	1,633	1,689	1,498	1,124	955	872
Total number of students (approx.) which can be accommodated in ICAR- AU system with ideal FS ratio (leading to effective utilization of in- position faculties)										74,208	63,992	58,452

As per AICTE and NIRF's ideal FS recommendations, an additional ~74.2K students could have been accommodate as per 2019-20 data. It is evident from the table that ICAR AU system has managed to fill about 14% of these seats in 2020-21 and further 9% in 2021-22. The overall projections may vary based on time contribution of faculties on teaching, research and extension, intake capacities of AUs, other ICAR & state level policy related decisions etc.

ICAR-National Agricultural Higher Education Project ICAR and World Bank funded project

Project Development Objective (PDO):

To support Participating Agricultural Universities and ICAR in providing more relevant and higher quality education to agricultural university students.

Awarded AUs under NAHEP till date (62)

Category of AUs	Total number	Awarded AUs under NAHEP
• State Agricultural AUs	64	55
• Deemed universities	4	4
• Central level AU	3	3

Key components of NAHEP

Total budget outlay: INR ~1,100 crores (USD 165 million)

Component of NAHEP	Key objectives & focus
1. Support to AUs	
1a. Institutional Development plans (IDP)	Quality enhancement, business entrepreneurship & employability; focus on UG students
1b: Centres for Advanced Agricultural Science and Technology (CAAST)	Scientific entrepreneurship, employability & research effectiveness; focus on PG students
1c. Innovation Grants (IG)	Attain accreditation
2. Investments in ICAR	Institutional reforms and ICT infrastructure
3. Project Management and Learning	Administer, Supervise, Monitor and Evaluate

Enhancing competitiveness through market-oriented pilot and certificate courses

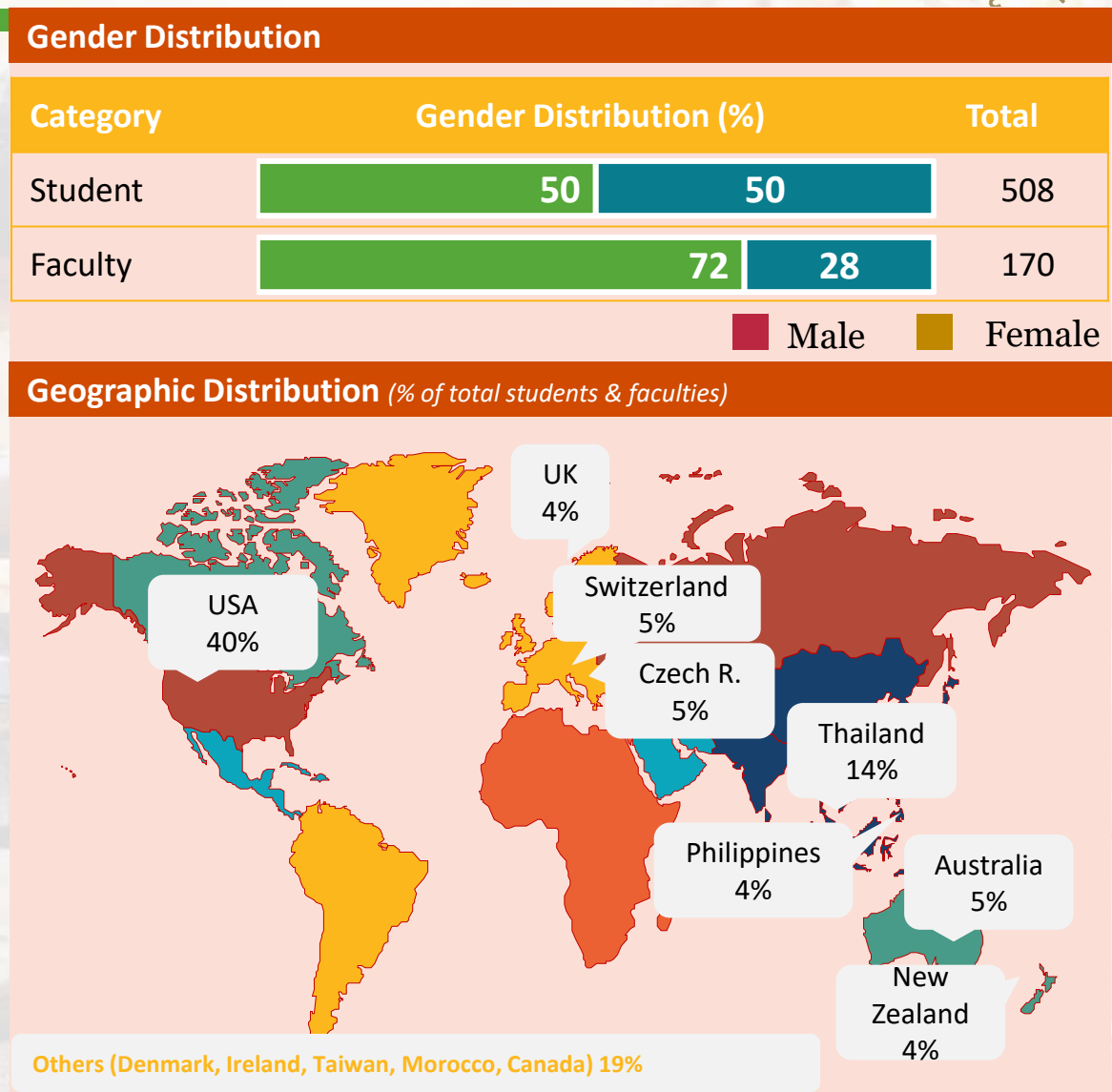
ICAR

S.N.	Type of courses	No. of courses developed under NAHEP	No. of courses implemented NAHEP so far	No. of beneficiaries benefitted till date					
				PhD	PG	UG	Diploma	12+	Total
1	Pilot	92	57	123	365	2,613	-	-	3,101
2	Certificate	260	146	542	945	4,904	44	216	6,651
3	Vocational	243	91	468	1,176	11,261		155	13,060
	Total	595	294	1,133	2,486	18,778	44	371	22,812

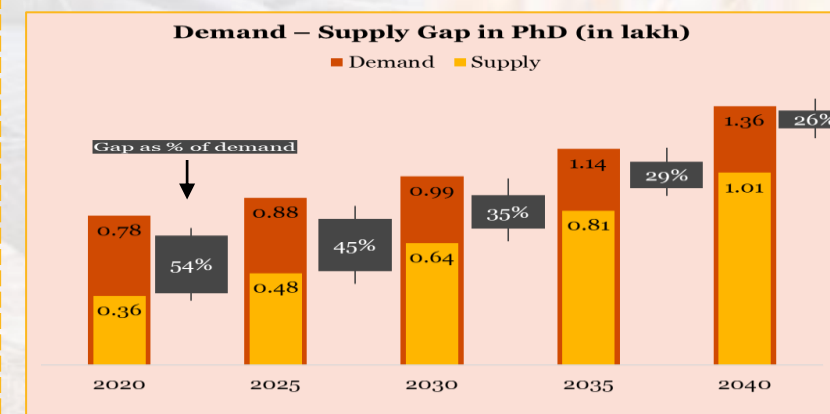
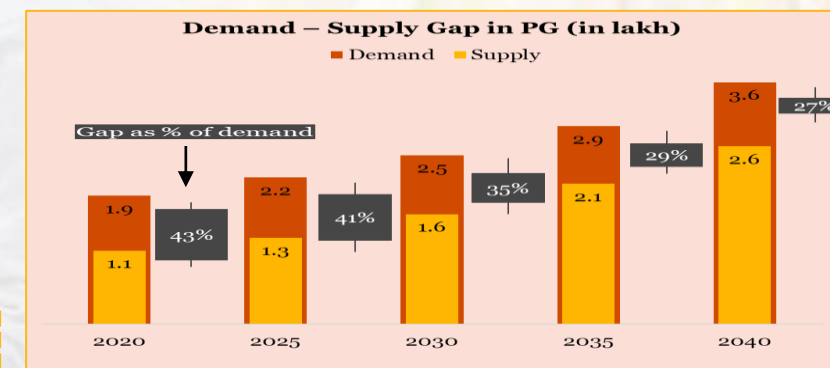
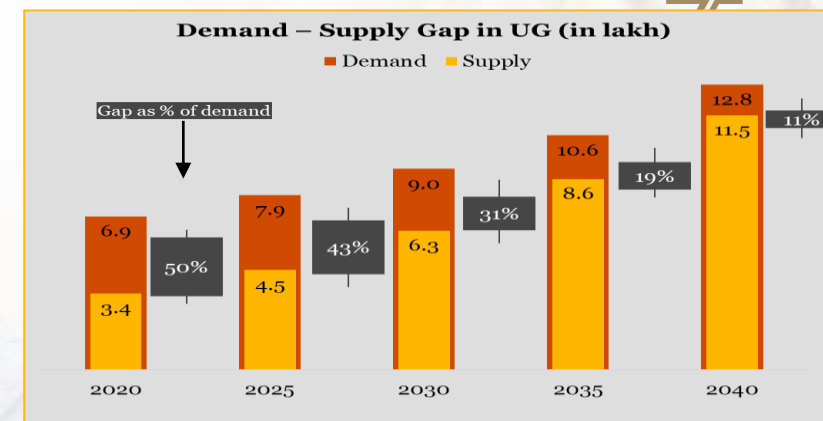
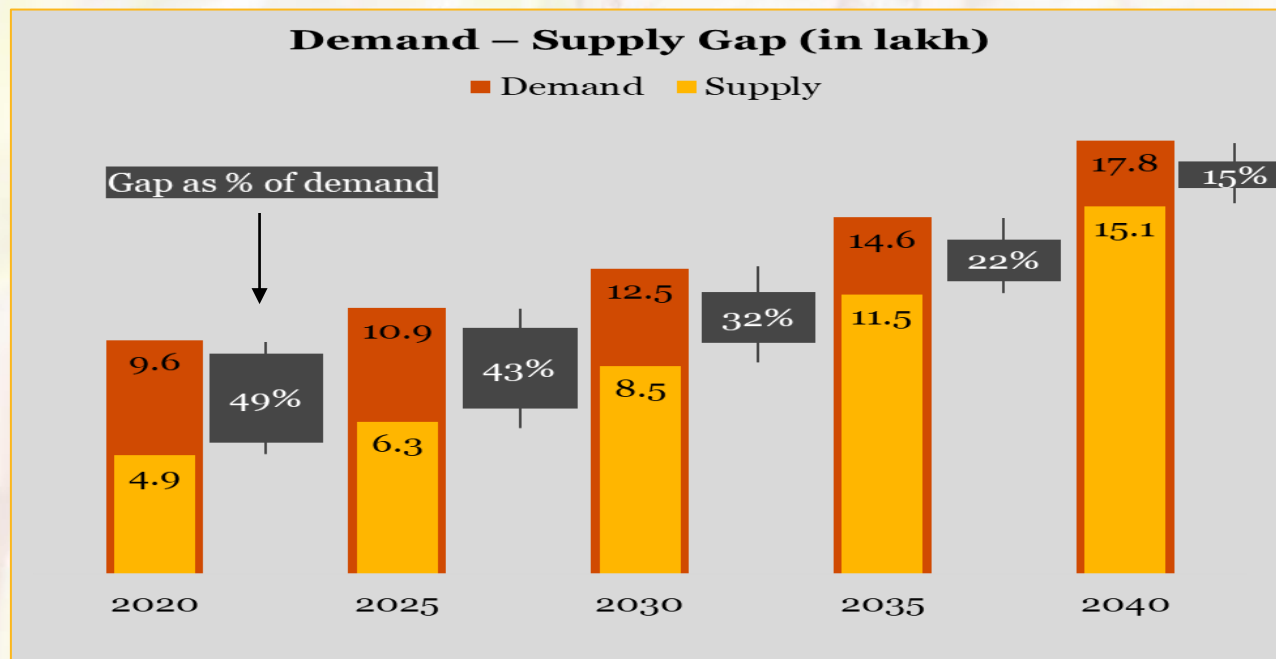
International trainings for students and faculties



	Number of subject areas covered during the international training	160
	Number of countries covered during the international training	27
	Number of host institutes trained students and faculties	89
	Number of AUs sent students and faculties for international training	20



Overall Supply and Demand Gap estimations



- Looking at the supply demand gap for current year, the total demand for agriculture and allied graduates is **9,58,777** whereas the total available supply stock during the year is **4,88,882**. It may be observed that there is a **49% gap** in demand and supply of overall agriculture and allied graduates.
- The gap for 2025 stands at **43%**, for **2030** it is **32%** and for **2035** it is **22%** whereas in **2040** it will significantly drop to **15%**.

- Demand is expected to grow at **3.1% CAGR** from 9.5 lakhs to 17.7 lakhs from 2020-40
- ~80% of total demand is for the top 5 streams (Agri, Veterinary, Horti, Agri. Engineering & ABM)
- Agri Engineering & ABM is expected to grow at higher rate of 3.9% whereas forestry has lowest growth rate of 2.4%
- At the education level wise, UG has the maximum share in total demand of about 72% followed by PG & PhD.

Strategic recommendations from study – Short Term (1/2)

Recommendation

Requirement of additional colleges imparting agri higher education

Approach

- Requirement of additional 552 colleges across disciplines
- ICAR may deliberate in consultation with the state government and plan to increase these additional number of colleges by 2040 in phases

Additional colleges required

Streams	Total colleges required in 2040	Total colleges available in 2020	New colleges required
Agriculture	559	434	125
Veterinary Science	220	155	65
Horticulture	284	153	131
Agri. Engineering	111	100	11
Agri. Biotechnology	80	56	24
Food Science & Technology	97	65	32
Forestry	54	54	-
Fisheries	95	64	31
Dairy Science	123	47	76
Community Science	60	60	-
Agri-business Management	112	60	52
Sericulture	10	8	2
Food Nutrition & Dietetics	5	3	2
	1,811	1,259	552

There won't be any requirement of new colleges for PG & PhD separately

Major recommendations of Roadmap developed by ICAR

- The relaxation in residential requirements of UG, and PG (Done)
- Compliance with Academic Bank of Credits (ABC) as per the directives of the Ministry of Education (Done)
- Common entrance test may be conducted by ICAR for admission of the students in all the AUs (20 AUs using ICAR entrance exam score)
- AUs to increase at least 10% seats starting from 2021-22 academic session on annual basis (Already implemented. There is increase of 20% students during last 2 YEARS)
- Multiple exit and entry to be implemented as per guidelines (Constituted Deans committee)



Course Curriculum Developed during last 4 years

Type of the course

- **Communication Skills**
- **Industry Oriented Courses**
- **Entrepreneurial Skills**
- **Other Courses:**
 - Skill development
 - Vocational Course
 - Specialized taught course

Entrepreneurship skills

- Dairy Farming
- Certificate Course on Export-Import of Agricultural Commodities
- Hygienic handling and value-added products of fish and shellfish

Communication skills

- Scientific English
- Communication and Soft skills
- Sci-Com for Smart Scholars

Industry Oriented Courses

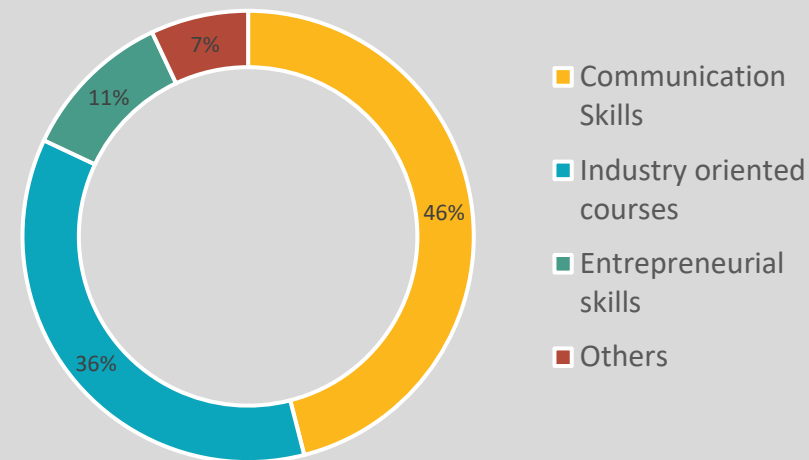
- Biologicals
- Pet Industry
- Equine Industry
- Bio Science Research
- Poultry Farming
- Production of Bio pesticides

Other Courses

- Remedial Courses on:
- Veterinary Anatomy
- Engineering Mathematics
- Creative and Innovative Thinking

58 Course curriculums developed

Beneficiaries by course type

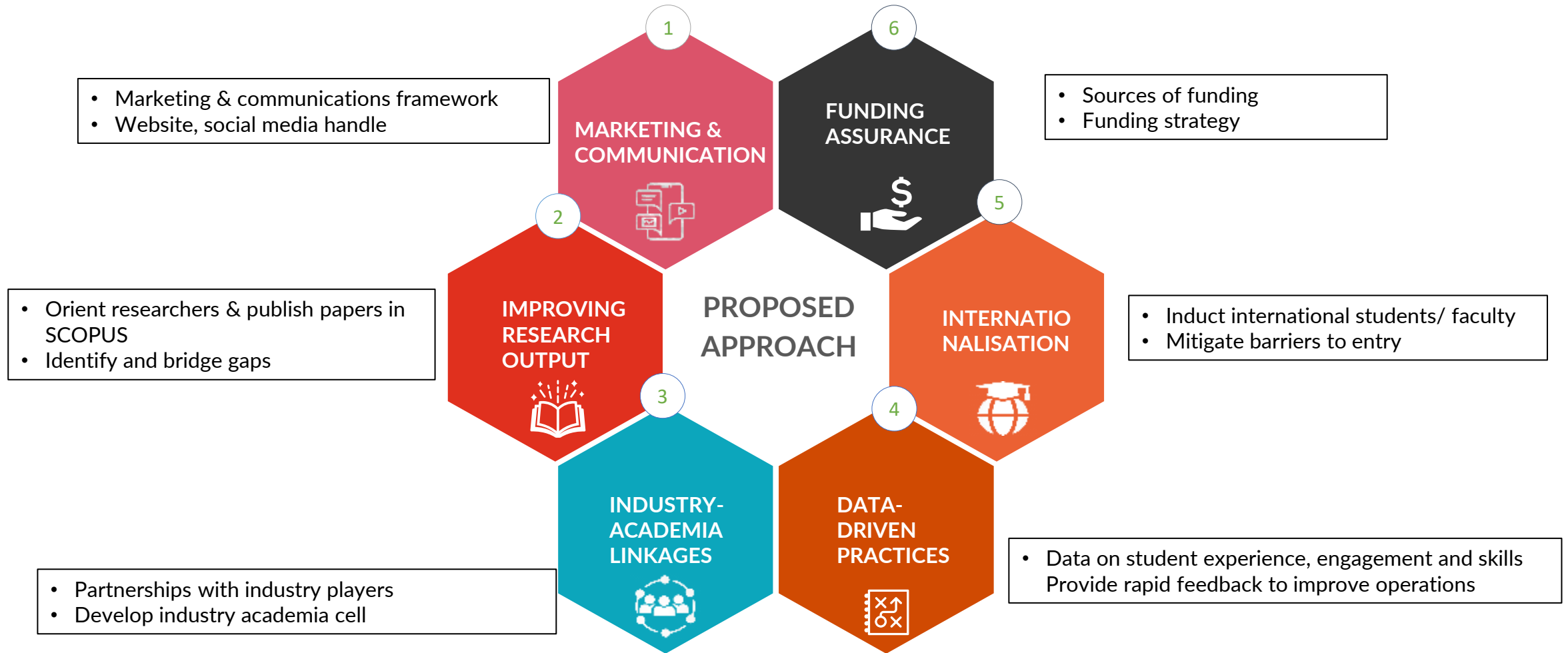


Total Beneficiaries: 8,333

BSMA RECOMMENDATIONS RELEASED ON AGRICULTURAL EDUCATION DAY



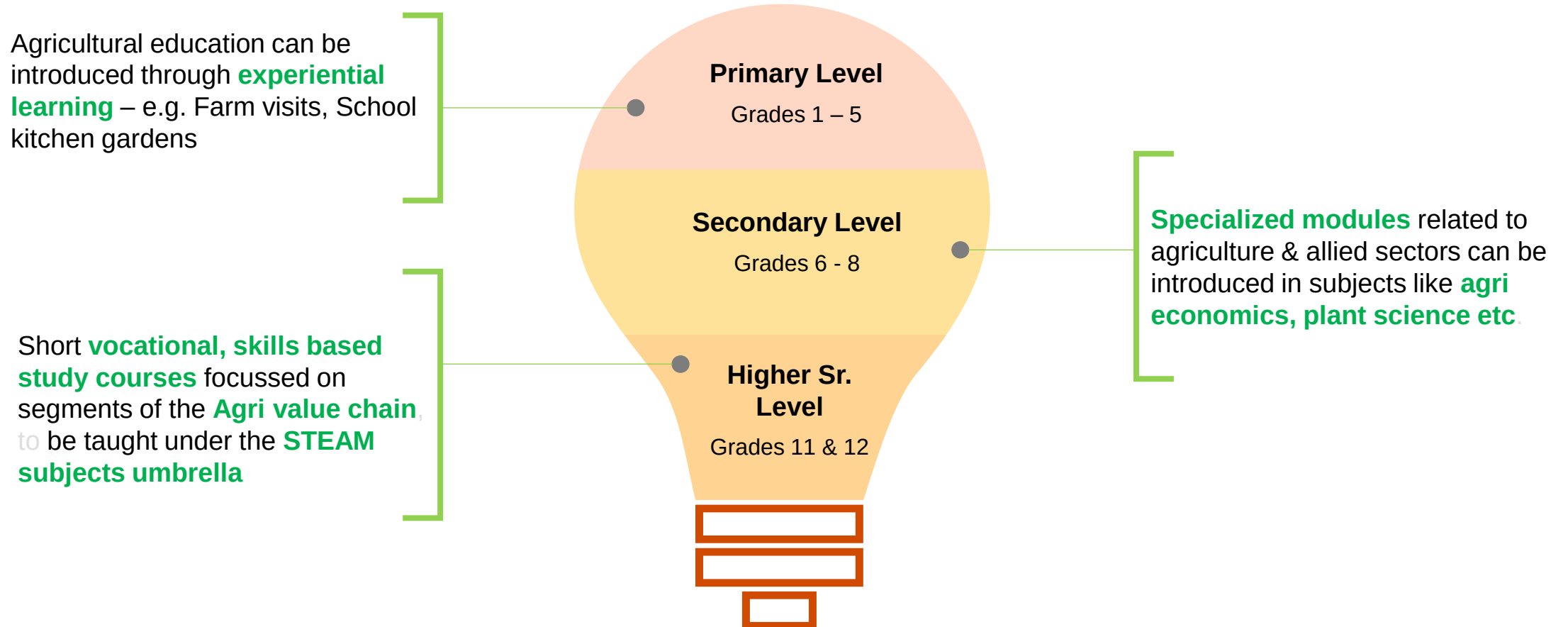
Approach to Global Rankings



Agricultural Higher Education

Weak demand but key input for growth

Study options for agriculture & allied subjects for schools



VIRTUAL CLASSROOM & AGRI-DIKSHA WEB CHANNEL



“A virtual classroom, is a system that provides the same opportunities for the teaching and learning process, beyond the physical limits of the traditional classroom's walls”

Agri-DIKSHA

The virtual classroom facility is bundled with Agri-DIKSHA web channel which is an interactive portal for facilitating teachers to develop and broadcast virtual learning modules.

Virtual classrooms will be part of the **'blended learning'** method that combines on-line and in-person teaching/learning wherein quizzes, video lectures and other learning material can be embedded in virtual learning modules. It combines entrepreneurial pedagogy, collaborative teaching and the latest technological teaching tools to create a modern and effective education service environment in education setting.

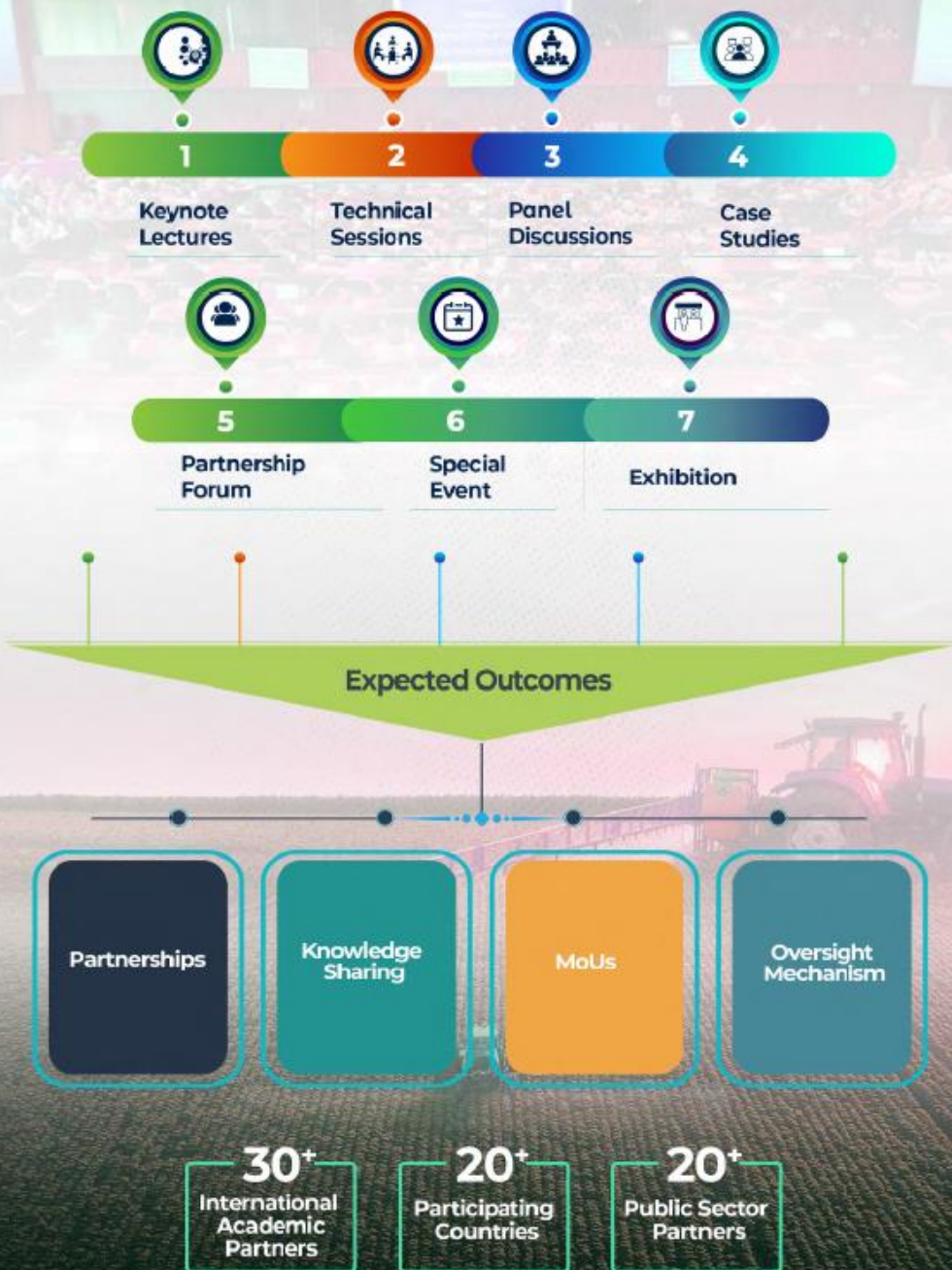
Features of Agri-DIKSHA

- ✓ High quality virtual learning modules
- ✓ Quick access to video repository
- ✓ Geographic, temporal and platform independence
- ✓ Online assessments
- ✓ Easy and seamless integration capabilities
- ✓ Security and data privacy
- ✓ Lectures delivered through video capture
- ✓ Any time access of lectures
- ✓ Live interaction / interactive learning experience
- ✓ Quizzes and polls functionality
- ✓ Personalized, inclusive learning experiences
- ✓ Intelligent search mechanism

Virtual Classrooms were established in all AUs under NAHEP - Component 2

In 2021-2022, 20+ capacity building sessions were conducted for more than 2200 participants from Agricultural Universities

Conference Components



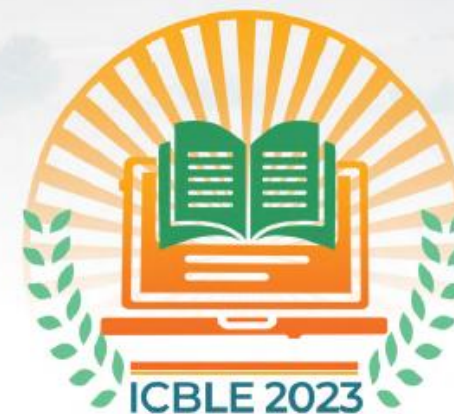
First Circular

International Conference on Blended Learning Ecosystem for Higher Education in Agriculture

21 – 23 March 2023

Venue

C. Subramaniam Auditorium, NASC Complex,
New Delhi-110012, India



<https://icble2023.krishimegh.in/>

Indian Council of Agricultural Research, New Delhi, India



ISO 9001:2015 Organization



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Initiated a new Agricultural Magazine
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Thanks