MY MEETING NOTES

NATIONAL WEBINAR ON
NEW FRONTIERS AND COMPETENCIES IN AGRICULTURAL EXTENSION EDUCATION
Department of Agriculture Extension & Communication of the Faculty of Agricultural Sciences at Rajiv Gandhi University (RGU), Arunachal Pradesh
### 30 April 2024

In this meeting note, Bai Koyu shares his valuable insights on the changing landscape of agricultural extension education and the emerging skill sets required by agricultural students from participating in this national webinar.

CONTEXT

Agricultural Extension Education has experienced significant changes over time. Emerging academic perspectives and innovative applied approaches are driving its swift evolution. While these changes are positive, students must equip themselves with new skills and competencies to be prepared for the competitive job market. They need to stay informed about the latest innovations in the field of agricultural extension education. Recognizing these needs, the Department of Agriculture Extension & Communication of the Faculty of Agricultural Sciences at Rajiv Gandhi University (RGU), Arunachal Pradesh organized a national webinar on April 30 2024, called 'New Frontiers and Competencies in Agricultural Extension Education'.

The purpose of the event was to brainstorm on the various competencies and recent developments in the field of agricultural extension education. The webinar was segmented into three distinct sections: the inaugural session, the technical session, and the valedictory session. A total of 135 participants, including students, faculty members, and officers from State Agriculture Departments nationwide, registered for the webinar.
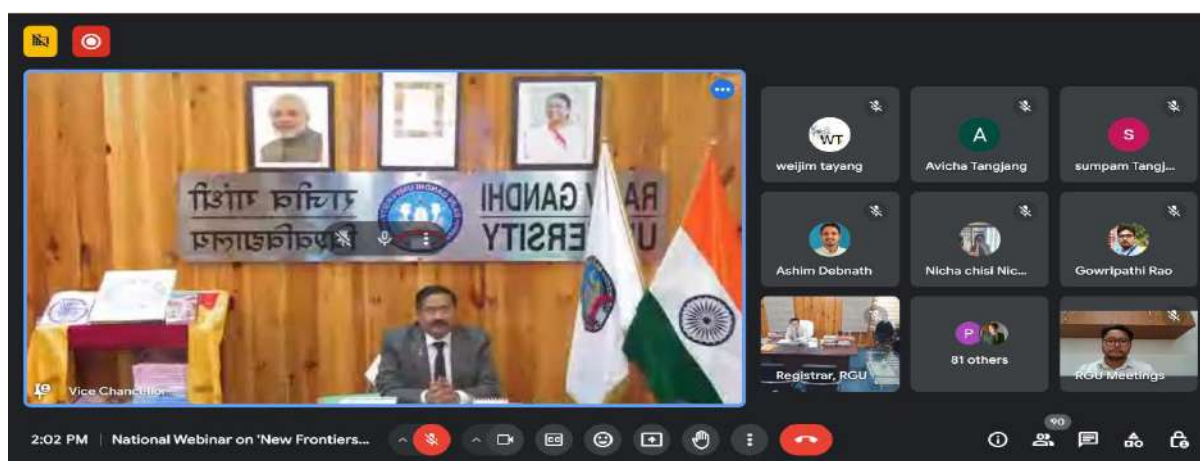
**Hon'ble Vice-Chancellor, RGU, Prof. Saket Kushwaha addressing the event**

In the beginning of the webinar, Prof. Saket Kushwaha, Vice Chancellor, RGU emphasised the vital role played by agricultural extension in technology dissemination and its evolution over time from the Lab to Land programme to its current form. He emphasised that merely keeping the data in the laboratory will not result in any change since it must be shared with the farming community. He also highlighted

the importance of harnessing digital extension as well as the need for digital literacy for farmers and the need for content creation in local dialects to reach a wider audience. Varsity Registrar, Dr NT Rikam emphasised the significance of webinars as a means of facilitating knowledge and information sharing among geographically dispersed learners. Prof. Sumpam Tangjang, Dean, Faculty of Agricultural Sciences, RGU, also highlighted the need for organizing webinars as it serves as a platform for exchange of knowledge.

KEY INSIGHTS FROM TECHNICAL SESSIONS

Technical Session-I

Dr Saravanan Raj, Director (Agricultural Extension), National Institute of Agricultural Extension Management, Hyderabad, initiated the discussion on the topic '**New Competencies for Agricultural Students**'. He emphasized the importance of Information Communication Technologies (ICTs) and various skill sets necessary for agricultural education to enhance the competencies of agricultural students for the current and future job market, in addition to obtaining an agriculture degree. He also emphasized the need to include modules on cutting-edge technology in the curriculum. He pointed out that most undergraduate and postgraduate students are pursuing degrees without developing Knowledge Intensive Agricultural specialization. Beyond regular class routines, students need to cultivate additional competencies in specific subject areas or technologies. With this in mind, students need to cultivate additional competencies in specific subject areas or technologies such as blockchain technologies, Closed Ecological Systems, Cultured/In-Vitro Meat, Digital Twinning, Farm Management Applications, Genetic Modification, Livestock Biometrics, Precision Agriculture Sensors, Rapid Iterative Selective Breeding (RISB), Satellite Imaging, Synthetic Biology, Unmanned Aerial Vehicles (UAVs), etc.
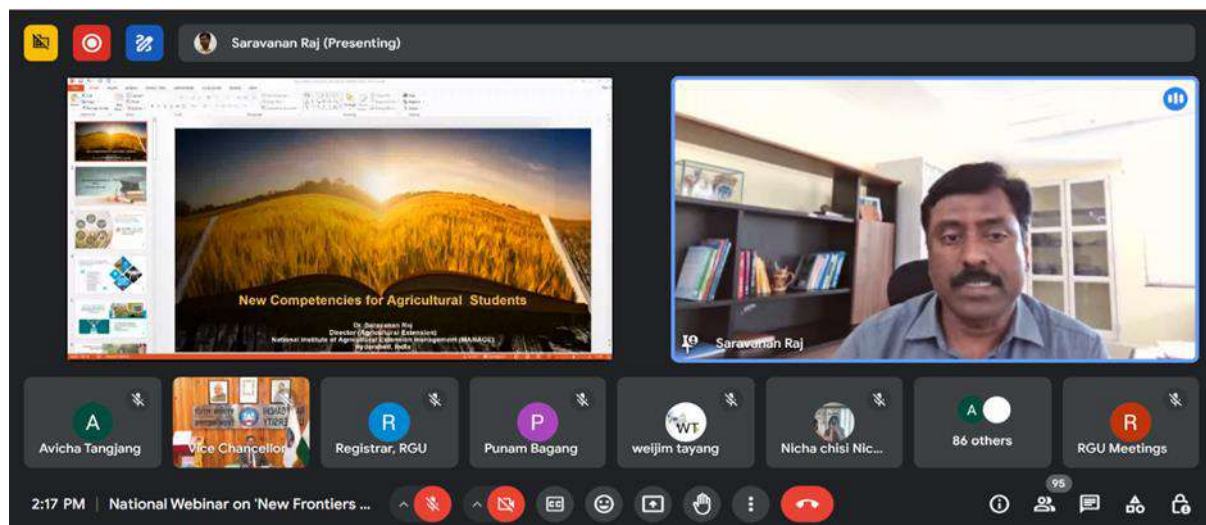
**Dr Saravanan Raj delivering his lecture during the technical session**

Regardless of whether it's included in the curriculum, students should pursue advanced courses that hold promising prospects for the future. Engaging in online courses can aid them in achieving specialization. Agricultural students must prioritize ICTs as well as digital technologies to enhance their competencies. This goes beyond simply searching for and exchanging information; it extends to software development for various aspects of agricultural production, storage and marketing given the increasing array of demands in these areas. The vast potential of Information Technology (IT) is evident, as we have already witnessed what the advent of Artificial Intelligence, Internet of Things (IOTs) can achieve in the agricultural sector.

The Centre for Development of Advanced Computing (C-DAC), India, provides specialized courses tailored to agriculture, offering students opportunities to benefit from advancements such as

blockchain technology. Apart from that the universities need to have more international collaboration, and encourage socially responsible research that is aligned with rural economic growth, for example, regenerative agriculture, natural farming or organic farming, etc.

Students can gain practical experience through Teaching Assistant opportunities and the RAWE programme, where they impart agricultural information to students and farmers. Integrating career development events into the curriculum equip students beyond agricultural subjects, preparing them for careers in science, business, and technology in agriculture. Additionally, students can benefit from numerous MOOCs offered by the United Nations (UN) agencies including Food and Agriculture Organization (FAO) and also the World Bank. For encouraging critical thinking about career paths, clear communication and effective performance skills are essential. Implementing career development schemes, internships with private companies, and research activities prepare students for innovative careers. Websites such as Internshala.com and platforms like Study Webs of Active-Learning for Young Aspiring Minds (SWAYAM) and Digital Infrastructure for Knowledge Sharing (DIKSHA) aid in gaining skills. Furthermore, awareness of Sustainable Development Goals (SDGs) and developing strong writing skills are also vital.

Agriculture students need to develop **cognitive skills** such as critical thinking, communication, mental flexibility, and planning; **interpersonal skills** such as mobilizing systems, building relationships, and effective teamwork; **self-leadership skills** including self-awareness, self-management, entrepreneurship, and goal achievement; and **digital skills** like digital fluency, digital citizenship, software utilization, and understanding digital systems. Agricultural universities must enhance all these skills through practical sessions that encourage students to ask questions and explore diverse approaches. The focus should be on developing the 4 Cs of 21st century skills: critical thinking, communication, collaboration, and creativity.
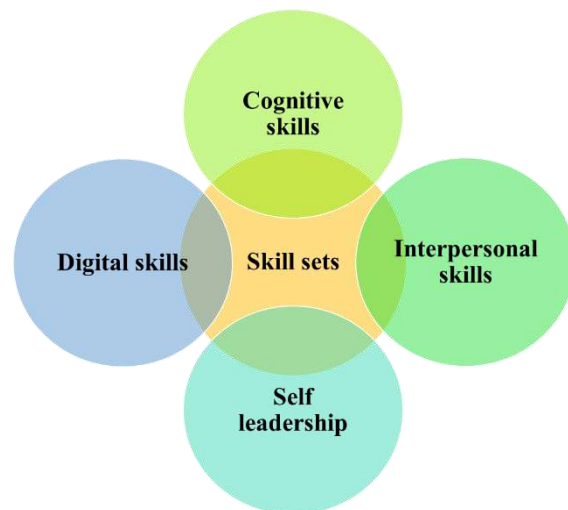

Essential skill sets for agriculture students

Technical Session-II
Dr Rajkumar Josmee Singh, Associate Professor in the School of Social Sciences, CPGS-AS, CAU (I), Umiam, Meghalaya, discussed the topic of 'Integration and application of Unmanned Arial Vehicles (UAVs) for providing evidence-based agro-advisory services on crop health assessment and monitoring'. He highlighted the importance of drones in agriculture and how it is being used for providing evidence-based advisories to the farming communities. He spoke in particular about the findings from the project '**Integration and Application of UAV for Crop Health Assessment and Monitoring with IIDS in Providing Evidence Based Agro-Advisory Services to Farmers of North-East India**' which is a collaboration of three organizations: (1) College of Post Graduate Studies in Agricultural Sciences, CAU (I), Umiam, Meghalaya; (2) North-East Space Applications Centre (NESAC), Umiam, Meghalaya; and (3) Digital India Corporation (DIC). The Mobile Based Agro Advisory System for North-East India (m4agriNEI) serves as the foundation for this project.

 Under this project six crops were covered. Using UAVs (drones) and the Interactive Information Dissemination System (IIDS) platforms, all enrolled farmers received evidence-based agro-advisory services to help them take swift action. The swift action thus taken is so efficient and economical that farmers were able to receive higher returns.
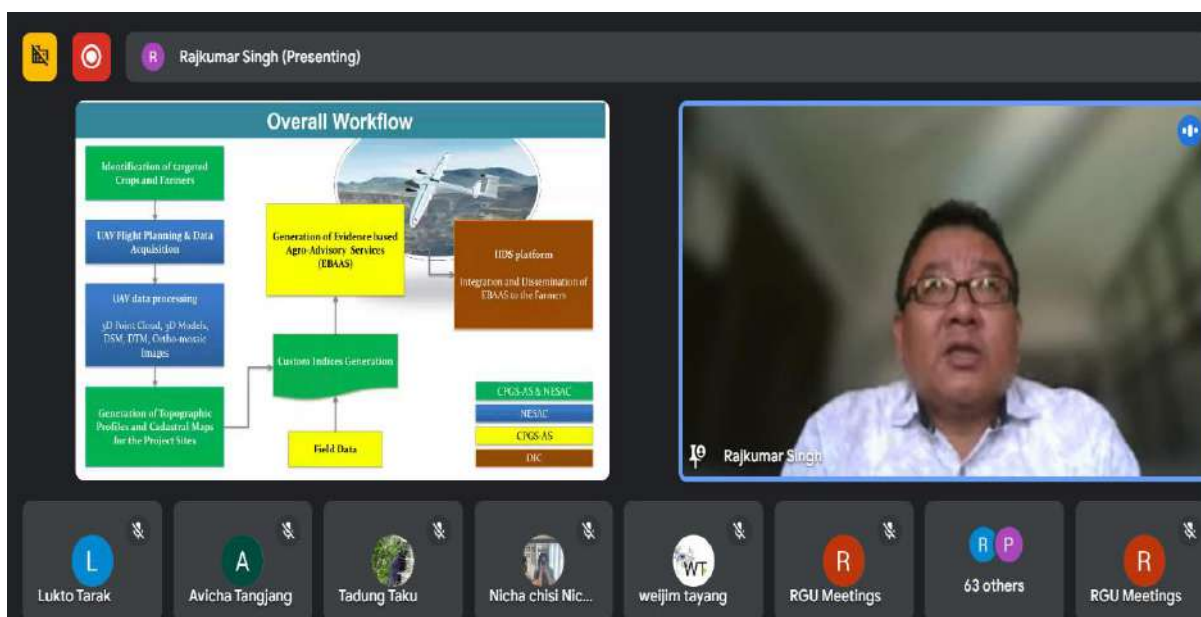
Dr. Rajkumar Josmee Singh delivering his lecture during the technical session

This project is currently running in the Indian state of Meghalaya, where the important crops are cabbage and cauliflower in East Khasi Hills District; paddy, pineapple and ginger in Ri-Bhoi District; and turmeric in West Jaintia Hills District. Data is collected using unmanned aerial vehicles (UAVs). Pin-point data, which include 3D models, digital surface models (DSM), digital terrain models (DTM), ortho-mosaic images, and Normalised Difference Vegetation Index (NDVI), are generated for the entire crop growth stage. Agro-advisory services, including disease and pest management, nutrient deficiency, and biotic and abiotic stress management, are accordingly offered to farmers 15 days in advance depending on their requirement.

The UAV flight generates plenty of images and for this reason customized indices were employed for giving meaningful advisories to the farmers. Data acquisition was carried out with tools such as Multi rotor drone designed and developed at NESAC, RGB camera, Micasense 5 band Multispectral sensor, Pix4Dfields, and Pix4D mapper which were then processed into meaningful products. A total of 600 farmers (100 farmers for each of the six identified crops) have been registered. So far, 247 UAV sorties were conducted in this pilot project. NDVI were used to monitor the growth and health of vegetation and to identify areas of stress in a particular crop, be it biotic or abiotic. Additionally, farmers were provided with information related to soil organic content (SOC), soil nitrogen content (SNM), and soil moisture content (SCM) over the various stages of crop growth. The project was able to make 1708 proactive calls to the registered farmers, and the agro-associates responded to 1285 SMSs with questions on a range of topics.

The agro-associates not only collect UAV-generated data but they also visit the field for collection of disease and insect samples and undertake laboratory testing for triangulation. It has been reported that around 69% precision was achieved in terms of paddy which can be further increased if a lighter camera such as a Hyperspectral imaging camera was to be employed. The project was able to provide near real-time agro-advisory services related to the identified crops, and to forecast the yields and identify appropriate harvesting time along with yield gap analysis information. It also helped in developing mitigative and adaptive strategies for adverse weather events. Further, the project was able to reduce farm drudgery and helped in the development and execution of a profitable farm business plan apart from providing market linkages for various produce.
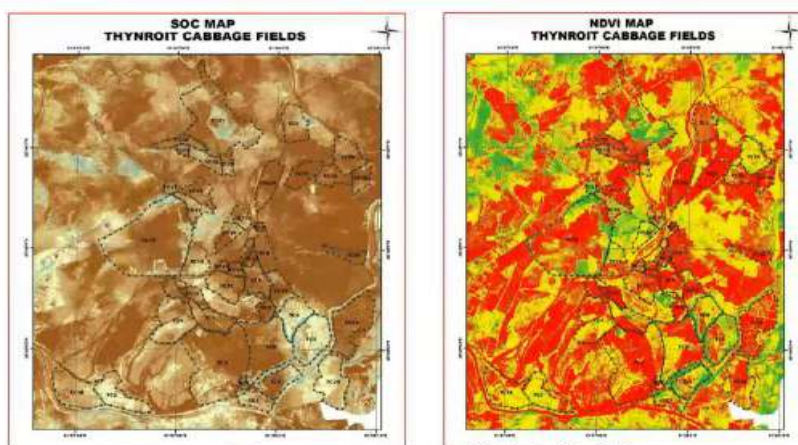
Dr Rajkumar Josmee Singh explaining the SOC & NDVI maps of cabbage fields in Tynroit village, East Khasi Hills district

IMPRESSIONS GAINED FROM THE WEBINAR

1. Agricultural students must expand their horizons beyond their typical course curriculum. It is essential for them to enrol in online courses to improve their skills, ultimately specializing in fields relevant to both current and future job markets.

2. The course syllabi for undergraduate and postgraduate programmes should be restructured so as to incorporate modules on cutting-edge technologies of global significance, such as blockchain technology, closed ecological systems, UAVs, etc.

3. Universities ought to encourage internships for students to gain practical experience. They should also facilitate international research collaborations to provide students with broader exposure as well as opportunities for new ventures.

4. Students and faculty members alike can enrich their skills by enrolling in online courses offered by various organizations such as FAO and the World Bank. Additionally, they can leverage existing e-learning platforms, such as SWAYAM and DIKSHA, to further enhance their curriculum vitae.

5. Evidence-based agricultural advisory services are necessary to provide farmers with near-real-time experiences using IIDS platforms with UAV assistance.

6. There is an urgent need for collaborative research cutting across the domain to provide valuable and meaningful agro-advisory services to farmers.

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