REPORT

Round table Conference on Climate Adaptation Measure for Small and Marginal Farmers of Uttar Pradesh

Lucknow

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Organized by- Krishi Navachar-FARMER Project

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EXECUTIVE SUMMARY

A roundtable conference on "Climate Adaptation Measure for Small and Marginal Farmers of Uttar Pradesh" was convened as part of the FARMER project, implemented by the Government of Uttar Pradesh, with support from the Gates Foundation and technical assistance from PPG Advisory LLP. The round table conference was conducted at Fortune Park BBD, Lucknow on 28th March 2026 from 10:00 am to 14:00 pm. The focus of the roundtable conference was to deliberate on the development of localized Agro-ecological climate smart model farm in Uttar Pradesh through leveraging convergence and synergistic approach of government led extension systems.

The roundtable conference brought together a diverse group of stakeholders including policy makers, academics, representatives from civil society, private sector organizations, NGOs, sector specialists, and farmers from Uttar Pradesh. The roundtable conference was expertly moderated by Shri Amit Mohan Prasad, Principal Consultant for the FARMER project, with support from Dr. C P Srivastava, Senior Advisor, to the FARMER project that had participation of 51 stakeholders.

CONFERENCE SESSIONS OVERVIEW

The roundtable conference was structured into three distinct sessions, in addition to the inaugural session held at the outset. Each session addressed a critical aspect of climate adaptation for small and marginal farmers in Uttar Pradesh.

Session 1: Climate Change and Its Impact on Agriculture in Uttar Pradesh

The first session focused on examining the effects of climate change on agriculture within the region. Participants discussed the challenges posed by a changing climate and explored how these shifts are impacting local farming practices, crop yields, and the livelihoods of small and marginal farmers in Uttar Pradesh.

Session 2: Deliberations on the 3F and 4 Pillar Extension Models

The second session was dedicated to in-depth discussions about the proposed extension models, specifically the 3F and 4 Pillar approaches developed under the FARMER Project. The conversations centered on the potential of these models to achieve higher production gains and positive economic outcomes by promoting more stable crop production and building farm resilience, even in the face of climate variability. The session also highlighted the sample design of the two model farms of Banda and Ayodhya district respectively.

Session 3: Innovations in Climate Adaptation

The final session highlighted current innovations aimed at building agricultural resilience through the use of technology, emphasizing the importance of adapting these innovations to local contexts. The discussion spotlighted several pilot initiatives led by the government, private sector, farmers, and agri-startups. The session focused on evaluating selected innovations like biochar, compressed biogas, carbon credit, artificial intelligence in agriculture, and NICRA climate smart agriculture practices that show promises for scaling up across Uttar Pradesh, with the goal of enhancing climate adaptation for smallholder farmers.

SESSION HIGHLIGHTS

Inaugural Session (10:00 am to 10:15 am)

The session commenced with the lighting of the ceremonial lamp by the Chief Guest, Guest of Honour, and dignitaries. Dr. C P Srivastava, Senior Advisor, FARMER project, conveyed the welcome address and briefed the audience about the objectives and theme of the program.
He underscored the significance of climate change adaptation in the current agricultural context.

Figure 1 Lighting of the ceremonial lamp by the Chief

Ms. Shalini Prasad, Chairperson of PPG Advisory LLP, emphasized the importance of the FARMER project by detailing the collaborative efforts required by policymakers, government officials, academia, sector experts, and farmers to address the challenges posed by agriculture and climate change. She further noted that agricultural challenges are constantly evolving and dynamic, making it imperative for all stakeholders to engage in coordinated and joint actions to effectively manage these issues. The scope of the FARMER project, along with the roundtable theme, correctly embeds the contemporary challenges faced by the agricultural sector.

Figure 2 Address by Ms. Shalini Prasad, Chairperson of PPG Advisory LLP Guest

Shri Mukesh Meshram, Additional Chief Secretary, Government of Uttar Pradesh, addressed the effects of climate change on agriculture and livestock. He recommended enhancing farmers' adaptive capacity by integrating context-specific solutions. Furthermore, he noted that increased mechanization and the use of chemical fertilizers have contributed to a decline in livestock populations, which has, in turn, significantly impacted soil organic carbon levels. The reduction in soil organic carbon has negatively impacted state soil health and diminished water retention capacity. Additionally, the livestock population has declined by approximately 30% compared to the 2019 census. It is imperative to reconsider and adapt farming systems to incorporate animal husbandry. He emphasized the importance of livestock in providing rural energy through biogas plants at both the community and individual levels. He stressed the importance of scientifically selecting breeds for small and marginal farmers, as this can help supplement their income. He further highlighted the importance of creating models related to fisheries, hydroponic, and water recharging structures, and floriculture that has potential to boost farmers income. Finally, he highlighted the importance of social media influencers who present model farms to agricultural

communities. He suggested that uniting these social media influencers in agriculture could significantly enhance public awareness regarding best practices in model agriculture.

Figure 3 Address by Shri Mukesh Meshram, Additional Chief Secretary, Government of Uttar Pradesh

Dr. Pankaj Tripathi, Director of Agriculture, Government of Uttar Pradesh, discussed the implications of rising temperatures, diminishing groundwater resources, and issues related to soil health affecting the agricultural sector. Over the past ten years, the state has observed notable changes in rainfall patterns, leading to inconsistent precipitation that has influenced agricultural output during both the Kharif and Rabi seasons. Statistical data demonstrate an increase in production of the state's principal crops. Nevertheless, higher cultivation expenses have contributed to stagnant income levels among farmers. He subsequently addressed the concern of deteriorating soil ecology resulting from the overuse of rotavators and cultivators—which can create a hard pan—as well as the excessive application of chemical fertilizers. For example, earthworms—once regarded as the farmer's ally—are now notably absent from many agricultural fields. He emphasized the coordinated work of agriculture, horticulture, fisheries, and animal husbandry in the state to overcome the emerging challenges. He highlighted the importance of zero tillage, agroforestry, crop rotation, integrated nutrient management and importance to balancing NPK fertilizer to 4:2:1 to promote sustainable agriculture. He recommended developing strategies to increase the adoption of solar energy solutions in comparison to non-renewable sources, as well as promoting the use of land levelers. He also highlighted the growing importance of seed production for green manure within the state. Furthermore, he underscored the necessity to identify advanced measures related to nutrient management, carbon sequestration, knowledge dissemination, energy efficiency, weather adaptation, and water conservation, and invited suggestions to help shape the state's vision for 2047.

Figure 4 Address by Dr. Pankaj Tripathi, Director of Agriculture, Government of Uttar Pradesh

SESSION-1

CLIMATE CHANGE AND ITS IMPACT ON AGRICULTURE 10:15 AM – 11:15 AM – MODERATED BY- DR C P SRIVASTAVA, SENIOR ADVISOR, PPG ADVISORY LLP AND DR. SUSHANT SRIVASTAVA, PROFESSOR AND HEAD, ANDUAT, AYODHYA

Dr. C P Srivastava, Senior Advisor at PPG Advisory LLP, delivered the opening presentation of the session, establishing the context of climate change and its effects on agriculture. He emphasized the increasing frequency of extreme droughts and floods, as well as erratic weather events observed in recent years. These shifts in weather patterns have adversely impacted crop productivity, soil health, biological processes, local flora and fauna, and consequently, farmers' incomes. He emphasized the upward trajectory of food grain production in Uttar Pradesh from 2017 to 2025. Despite this progress, net income for farmers has remained unchanged. Subsequently, he advised prioritizing crops with greater benefit-to-cost ratios. Subsequently, he addressed the deteriorated soil health conditions, with particular emphasis on soil carbon, available nitrogen, available sulfur, boron, and zinc levels. During the latter portion of his presentation, Dr. Srivastava displayed charts illustrating thirty-year trends in maximum temperature and rainfall. District-level data on rainfall during the southwest monsoon and root zone soil moisture (January-February) were also presented to demonstrate the effects these changes have on agricultural productivity.

Finally, he highlighted the importance of enhancing nitrogen and water use efficiency, advancing farm mechanization, and minimizing post-harvest losses as key strategic priorities to increase agricultural productivity and shielding it from climate-related disruptions.

Figure 5 Address by Dr. C P Srivastava, Senior Advisor at PPG Advisory LLP

The second presentation of the first session addressed climate change and its effects on livestock farming. The session was delivered by Dr. Sushant Srivastava, Professor and Head, Department of Veterinary Gynecology and Obstetrics, C.V. Sc. & A.H., ANDUAT, Ayodhya. Dr Sushant highlighted the importance of livestock in India as approximately 16 percent of the world's cattle and 57% of its buffalo are found in India and how livestock population contributes to the circular economy. However, the circularity is now challenged as the livestock population has reduced as FYM are not integrated back to the soil. He stressed that the productivity of livestock in Bundelkand region is less compared to the national averages. He highlighted the different human-induced causes and natural causes that contribute to the climate change and how it affects livestock productivity. The rise of maximum temperature and lowering of minimum temperature both causes decrease in livestock productivity and emphasized the suitability of indigenous breeds. Additionally, it was noted that methane production is lower in indigenous breeds compared to exotic breeds.

Dr Sushant later highlighted the different direct and indirect effects of stress due to rise in ambient temperature, relative humidity and carbon dioxide. Livestock productivity and reproductive capacity are significantly influenced by climate change. Climate

change poses risk not only to livestock systems, but also to global livelihoods and food security. The livestock sector, governmental bodies, and research organizations must collaborate to expedite the implementation of climate-smart agricultural practices, thereby enabling both smallholder and large-scale producers to adapt effectively. While all effects of climate change cannot be anticipated until they emerge, it is crucial for farmers to remain informed and prepared to adopt adaptive strategies.

Figure 6 Address by Dr. Sushant Srivastava, Professor and Head, ANDUAT, Ayodhya

Figure 7 Joint Photograph of Dignitaries

SESSION II

EMERGING MODEL OF CLIMATE ADAPTATION – THE 3F AND 4 PILLAR EXTENSION MODEL 11:15 AM – 12:30 PM – MODERATED BY- MR AMIT MOHAN PRASAD, PRINCIPAL CONSULTANT, PPG ADVISORY LLP

The first presentation of the second session was focused on elaboration of Krishi Navachar-FARMER project 3F and 4 Pillar. The discussion session was led by Shri Amit Mohan Prasad, Principal Consultant, PPG Advisory LLP. Shri Prasad informed the participants that Government of Uttar Pradesh has conceptualized a climate smart agriculture project and later discussed with Gates Foundation on the Project concept. Followed by the discussion, "Farmer's Adaptation Related Measures for Environmental Regeneration" –FARMER Project has been launched since December 2025 and Gates Foundation commissioned PPG Advisory as Technical Support Agency for the FARMER Project. In the first phase, the project will be implemented in 6 Divisions (Gorakhpur, Ayodhya, Varanasi, Vindhyachal, Chitrakoot Dham, Jhansi); covering 23 Districts and 255 Blocks targeting 3 Lakh farmers and 20% women participation in three years. The strategic objective of the project is to achieve increase and stabilize crop production, resilient farm incomes across target geographies despite climate variability. Shri Prasad informed the participants that FARMER project strategic objective is hinged on three outcomes and would strategically focus convergence models to achieve the project outcomes outlined as-
Outcome 1: Innovations developed- Context-specific Climate Smart Agricultural Innovations identified, tested and deployed in demo plots
Outcome 2: Validated small holder value propositions- Selected innovations improve yields, reduce costs and manage climate risk
Outcome 3: Adoption at scale- Climate resilient innovations adopted at scale by small holder farmers through farmer to farmer-led extension system

Subsequently, Shri Prasad provided an overview of the establishment of 255 climate-resilient demonstration plots, emphasizing the importance of validating and disseminating project learnings as key activities. In addition, Shri Prasad presented the conceptual framework guiding the development and implementation of these demonstration plots. Demonstration plots of the FARMER project will be guided by the conceptual 3F Framework -Farm, Farmer and Formulation. The formulation or design of the demonstration plots will be based on four pillars concept that represent- Pillar A, B, C, and D. The four pillars of the formulation are described as –

- Pillar A -The demo farms have to be integrated with Agriculture+ Horticulture+ Agroforestry + Animal Husbandry.
- Pillar B - This pillar consists of 15 different farm practices that must be implemented at each demo plot to ensure resilience. These practices are low cost and can be easily adopted by the farmers.
- Pillar C- This pillar includes 20 farm practices that are considered desirable, serving as supplementary and complementary items. If these practices are further integrated into the demo farm, it further adds comprehensiveness of resilience to the farm.
- Pillar D- This pillar focuses on including the of Indigenous Technical Knowledge (ITK) of the farmers to the demo plots.

Complementing the presentation, Mr Pratyush Ranjan presented the conceptual framework of the FARMER Project and presented the design of the two demonstration plots that were prepared in a participatory mode with farmers, extension

functionaries and technical support of PPG Advisory LLP.

Figure 8 Address by Shri Amit Mohan Prasad, Principal Consultant, PPG Advisory LLP

DISCUSSION SESSION

Mr. Chandan Sinha, Retired Additional Chief Secretary, Government of West Bengal, commended the thorough framework of the climate-smart farm design and its implementation strategy. He recognized the FARMER project's design element which incorporates climate change and environmental regeneration. Furthermore, he underscored the significance of ecological sustainability within the broader context of environmental development.
Subsequently, Shri Sinha warned that the farmers' heavy reliance on urea could impact the forthcoming Kharif season due to the ongoing war crisis in West Asia and the FARMER project should reorient its activity accordingly. He also recommended that state policymakers develop plans in anticipation of future crises and stressed the importance of inclusion of local community institutes in planning and participation in the implementation processes.

Figure 9 Address by Mr. Chandan Sinha, Retired Additional Chief Secretary, Government of West Bengal

Mr. Shashank Gupta, CEO, PPG Advisory LLP- Congratulated the entire team of PPG Advisory LLP for organizing the workshop bringing together all the stakeholders of the climate change and agriculture sector. He emphasizes the significance of addressing post-harvest losses within the project's activities over time. By incorporating strategies to mitigate these losses and strengthening both backward and forward linkages, farmers' incomes can ultimately be enhanced.

Figure 10 Address by Mr. Shashank Gupta, CEO, PPG Advisory LLP

Dr V K Mishra, Ex Director, ICAR, appreciated the effects of the PPG Advisory LLP for developing the conceptual framework and its implementation strategy. He highlighted the broader potential for diversification during the Rabi season compared to the rice-based Kharif season. He recommended prioritizing intercropping with cereals, while also increasing attention on nutrient-efficient systems. Additionally, he noted that farmers might benefit from opportunities presented by climate change, as rising carbon dioxide levels are expected to enhance the productivity of both C3 and C4 crops. He further underscored the significance of water productivity and water use efficiency as key adaptation strategies for climate change.

Figure 11 Address by Dr V K Mishra, Ex Director, ICAR

Dr. N.K. Bajpayee, Director Extension, Banda University of Agri & Technology highlighted the work done by the agriculture university in thematic areas of climate resilience since 2016. He discussed the irrigation systems in the Bundelkhand region and their impact on crop production. He recommended identifying suitable irrigation technologies for small and medium-scale farmers in Bundelkhand to enhance crop yields and support climate adaptation strategies.

Dr Bhanu Prakash Mishra, Professor and Head of the Department of Agricultural Extension at Banda University of Agriculture & Technology, highlighted that the Bundelkhand region is recognized as a

Figure 12 Address by Dr. N.K. Bajpayee, Director Extension, Banda University of Agri & Technology

climate change hotspot within Uttar Pradesh. He emphasized the necessity of connecting farmers with diversified livelihood opportunities and value addition, which can enhance farmers' income and mitigate distress migration.

By supporting farmers in accessing a broader range of income-generating activities beyond traditional agriculture, their financial stability can be improved. Additionally, encouraging value addition enables farmers to capture greater returns from their produce. These strategies collectively contribute to increasing household earnings and reducing the

Figure 13 Address by Dr Bhanu Prakash Mishra, Professor and Head of the Department of Agricultural Extension

need for farmers to migrate under distress, thereby fostering resilient rural communities.

Shri Neeraj Subrat from Ernst & Young (E&Y) expressed appreciation for the project team's efforts in coordinating a knowledge sharing workshop. He acknowledged the importance of bringing together key stakeholders and actors to facilitate meaningful exchange and collaboration. The workshop was recognized as a valuable platform for sharing insights and fostering engagement among participants involved in the project. He further added that the significance of robust extension mechanisms is particularly pronounced in Uttar Pradesh, given its vastness and diversity. Effective extension services are crucial for reaching farmers across varied agro-climatic zones, ensuring the dissemination of best practices and innovations. In this context, the deployment of demonstration plots directly on farmers' fields stands out as an exemplary extension model implemented by the FARMER project. These demonstration plots serve as practical learning sites, enabling farmers to observe and adopt resilient agricultural practices, thus fostering knowledge transfer and capacity building at the grassroots level.

Figure 14 Address by Shri Neeraj Subrat from Ernst & Young

Dr G K Singh, Ex Vice Chancellor, DUVASU stressed the importance of managing heat stress, feeding timings, feed content (fat percentages) for effective management of the livestock. He recommended assessing the specific local context and formulating adaptive solutions tailored to local conditions to effectively address the long-term impacts of climate change. When selecting livestock for agricultural operations, it is important to prioritize animals that produce lower methane emissions. This approach supports efforts to mitigate climate change by reducing greenhouse gas outputs associated with animal husbandry.

Additionally, attention should be given to the limited availability of green fodder during the Zaid season. Addressing this challenge is crucial for maintaining livestock health and productivity and should be emphasized in planning and implementation strategies.

Figure 15 Address by Dr G K Singh, Ex Vice Chancellor, DUVASU

Mr. Soraj Singh, Ex Director Agriculture, Government of Uttar Pradesh, emphasizes the critical role of combining agricultural practices with animal husbandry. He points out that soil organic carbon levels are currently low, which poses challenges for soil fertility and productivity. To address this, Singh highlights the significance of animal husbandry and mulching as key strategies for improving soil health. By integrating livestock management with crop cultivation and utilizing mulching techniques, farmers can enhance soil organic matter, promote nutrient cycling, and ultimately achieve more sustainable and productive farming systems.

Figure 16 Address by Mr. Soraj Singh, Ex Director Agriculture, Government of Uttar Pradesh

Dr. Kanij Fatima, Additional Director Extension, Government of Uttar Pradesh, emphasized the growing significance of artificial intelligence (AI) in transforming agricultural practices. She underscored how integrating AI technologies can enable the provision of real-time advisories to farmers, thereby enhancing decision-making and productivity in the agricultural sector. By utilizing real-time data and intelligent systems, farmers can receive timely, tailored recommendations that support improved management of crops and resources, ultimately leading to more efficient and sustainable farming outcomes. She also stressed the importance of early warning systems that reach farmers in real time.

Figure 17 Address by Dr. Kanij Fatima, Additional Director Extension, Government of Uttar Pradesh

Mr Nandu, Progressive Farmer, Sitapur, and Mr Mansaram Yadav, Barabanki stressed the quality of feedstock and judicious use of fertilizer in crops. Mr Mansaram highlighted his farming model that has an efficient nutrient management system.

Figure 18 Address by Mr Nandu, Progressive Farmer, Sitapur

Figure 19 Address by Mr Mansaram Yadav, Progressive Farmer, Barabanki

Ms Sabeena Khatoon, Progressive farmer, Ayodhya, shared her farming experience with the participants and stressed the importance of proper crop selection and crop diversification. She stressed the importance of proper irrigation management and nutrient management. She later shared her experience of residue management and maintaining proper soil ecology.

Figure 20 Address by Ms Sabeena Khatoon, Progressive farmer, Ayodhya

SESSION III

INNOVATIONS AROUND CLIMATE ADAPTATIONS
12:30 PM – 14:00 PM – MODERATED BY- MR PRATYUSH RANJAN SINGH, SENIOR PROGRAM MANAGER, PPG ADVISORY LLP

The third session deliberated on the innovations in climate adaptation focus on building resilience through use of technology and integrating it with localized context. The first presentation of the session was focused on Biochar – A stable carbon and its scope in climate adaptation- Mr Bhanu Singh, Sector Expert – BMS Sitapur.

Mr. Singh emphasized that declining Soil Organic Carbon (SOC) levels are undermining the agricultural foundation of Uttar Pradesh. He explained that when carbon exits the soil ecosystem, overall agricultural resilience is significantly compromised. Furthermore, he noted that a cycle of chemical dependency results in biologically inactive soils, as continuous application of chemicals depletes soil organic carbon and ultimately leads to both structural and biological deterioration. He shared Biochar as a stable carbon made from agricultural biomass through pyrolysis process that improves nutrient retention, water holding capacity, and microbial habitat.
Furter, Mr Singh informed that while active carbon (like compost) decays rapidly and releases CO_2 back into the atmosphere, biochar locks carbon into a highly stable molecular structure that persists safely in the soil. Also, biochar serves a powerful dual climate purpose: actively mitigating greenhouse gas emissions by permanently storing carbon, while helping crops adapt to extreme heat and drought through enhanced soil resilience. He highlighted the challenge of high capital cost of modern, clean-tech biochar production units that limit adoption by local farming communities. He recommended targeted financial assistance to Farmer Producer Organizations, agricultural cooperatives and village Panchayats for procurement of production units that large scale adoption of the technology.

Figure 21 Session by Mr Bhanu Singh, Sector Expert – BMS Sitapur

The second presentation of the third session was focused on converting agricultural waste into energy, primarily focusing on production of compressed biogas (CBG). The session was led by Mr Akaash Mohan, Sector Expert of the subject matter.

Mr. Akaash addressed the pressing issue of the energy crisis, drawing a connection between climate change and energy demands. He explained that India generates a substantial volume of crop residue, with total annual production estimated at 550–600 million metric tons (MMT). Of this, approximately 120–150 MMT is considered surplus crop residue that could be utilized more productively. Mr. Akaash underscored the significant economic potential of generating compressed biogas (CBG) from this surplus, suggesting an opportunity valued at INR 1.5–2 lakh crore. This, in turn, could create substantial employment opportunities. He also emphasized that much of the surplus crop residue is currently disposed of by burning, a practice that not only wastes valuable resources but also contributes to

pollution. By converting this residue into CBG, farmers and communities could transform waste into a valuable source of revenue.
Mr. Akaash further explained that CBG can be produced from organic waste, and it is a purified form of raw biogas with methane levels exceeding 95%. The CBG production process also yields fermented organic manure as a byproduct, which can be applied directly to fields as a nutrient-rich fertilizer, supporting sustainable farming practices.
The versatile uses of CBG were also highlighted. Compressed biogas can be used as a clean fuel for transportation and is equally suitable for cooking, offering an environmentally friendly alternative to traditional fossil fuels.
Later, Mr Akaash detailed the process of producing CBG through industrial process and shared that in context of Uttar Pradesh paddy straw alone, if fully utilized at 10% CBG yield, could theoretically meet 100%+ of UP's city gas (CNG + PNG) demand. Even at 30–40% utilization efficiency (realistic near-term), it covers 30–40% of UP's CGD demand.

Figure 22 Session by Mr Akaash Mohan, Sector Expert - CBG

The third presentation of the third session focused on Carbon Credit- A tradable certificates earned by adopting sustainable practices. The session was presented by Dr Abhishek Pathak, Project Director-PANI. He informed the participants that carbon credit is a tradable good representing one ton of carbon dioxide equivalent (tCO2e) that has been reduced or removed from the atmosphere. Its purpose is to provide an economic incentive for companies to reduce emissions and invest in cleaner technologies and is issued by Governments, intergovernmental bodies, and verified private carbon standard programs worldwide. He informed the participants that there are two existing markets, compliance market (Mandated by government regulations) and volunteer markets (Companies choose to offset voluntarily). Later, he detailed all complete life cycle of the carbon project starting from Project design, registration, Monitoring Verification and Reporting (MVR), issuance, transaction and retirement. Dr Pathak, later share the roles of the key stakeholders of carbon credit market as -
Project Developers: Create and manage emission-reduction or removal projects. They generate measurable climate impact that can be credited.
Communities / Farmers: Adopt improved practices that deliver real, on-ground emission reductions. They are the backbone of nature-based project performance.
Verifiers (VVBs): Independent auditors who assess data and confirm climate outcomes. Their role ensures credibility and prevents over-crediting.
Standards Registries: Set methodologies, validate documentation, and issue carbon credits. Act as the backbone of market integrity and transparency.
Buyers Intermediaries: Corporates, governments, and brokers who purchase, trade, and retire credits. They create demand and provide market access for project developers.
He also shared that India's CCTS is set to operationalize, creating a regulated market

framework for emissions reduction and credit trading that was launched in June 2023 by Ministry of Power, MoEFCC, and BEE with a purpose to create a domestic carbon market that incentivizes emission reductions and supports India's net-zero 2070 target. At the end, Dr Pathak outlined the Carbon Kisan Connect project that is operational in the state of Uttar Pradesh.

Figure 23 Session by Dr Abhishek Pathak, Carbon Kisan Connect-PANI

The fourth presentation of the third session was on scope of Artificial Intelligence (AI) and Agriculture-. The session was led by Ms Kirti Pandey, Mission lead, OpenAgriNet, Centre for Open Societal Systems (COSS). She highlighted that farmers need real time information at all stages of their production cycle. She shared that Artificial Intelligence (AI) is emerging as a transformative force to address these issues through data-driven insights, automation, and precision techniques. It can be used for seed and crop selection, Crop Monitoring and Disease/Pest Detection, insurance, post-harvest management, predictive analytics for yield and sowing and market intelligence and supply chain. She highlighted that the Government of India is actively driving AI adoption through Bharat-VISTAAR (announced in Union Budget 2026-27) which is a multilingual AI platform integrating AgriStack (farmer ID, land records, crop data) with ICAR knowledge to deliver customized advisories, reducing risks from climate and markets. She also highlighted the OAN-OpenAgriNet DPI powered by AI for Agriculture and Livelihood that brings Institutions together and unlock power of data. Ms Pandey later shared about the MahaVISTAAR, Maharashtra's state-level AI-powered digital platform designed as a comprehensive companion for farmers. The app integrates AI with government data, weather services, market intelligence, and scientific knowledge from institutions like ICAR, Mahatma Phule Krishi Vidyapeeth (MPKV) Rahuri, and others.

Figure 24 Session by Ms Kirti Pandey, Mission lead, COSS

The fifth presentation was on Climate Smart Agriculture (CSA), Learning of NICRA for sustainable empowerment of farmers. Dr R K Singh, Head, KVK Hamirpur shared the initiatives undertaken by the KVK in addressing the issues of climate change. He shared the most promising climate resilient technologies that can be implemented in the Bundelkhand region. He shared that promising technologies related to natural resource management, horticulture and animal husbandry in the rainfed and irrigated areas.

Figure 25 Session by Dr R K Singh, Head, KVK Hamirpur

The Roundtable conference was concluded with formal votes of thanks by Shri Amit Mohan Prasad, Principal Consultant, PPG Advisory LLP.

He acknowledged the round table on Climate-Smart Agriculture to a close, with the depth of insights, the spirit of collaboration, and the shared sense of urgency that has defined the discussions. The roundtable discussion explored how CSA can simultaneously achieve three critical goals: sustainably increasing agricultural productivity and farmers' incomes, building resilience to climate change, and reducing greenhouse gas emissions where possible. From the innovative practices discussed, to the need for supportive policies, and stronger extension services – the pathways forward are clear, though the journey demands collective action from all stakeholders.

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