

Planet Dialogue Summary 2024

Keynote Speakers

The keynote speakers at the Planet Dialogue 2024 event underscored the urgent need for innovative solutions to address the growing challenges posed by climate change, especially in the agricultural sector.

Dr. Ajay Mathur highlighted several key areas where technological advancements can significantly improve farmer livelihoods while reducing environmental impact. He emphasized the importance of increasing farmers' income per hectare by improving resource efficiency, such as reducing water usage and carbon emissions in farming. Mathur also pointed out the potential of solar technology in transforming agricultural practices, specifically through the use of solar-powered agricultural pumps, which are more economically viable than traditional diesel and electric pumps. He stressed the need for strategic planning and financial models, such as loans from institutions like the World Bank, to facilitate the widespread adoption of solar pumps. Additionally, solar cold storage and agrivoltaics—integrating solar panels with agricultural production—present promising opportunities to reduce carbon emissions and increase farmer income.

Dr. Ashok Gulati provided a broader historical and environmental context, tracing the rapid global population growth from 1 billion in 1804 to over 8 billion today, which has dramatically increased the demand for agricultural resources. He discussed the impact of the Green Revolution, which initially ensured food security through high-yielding variety (HYV) seeds but led to significant soil degradation and a reduction in soil carbon due to excessive chemical use. Water scarcity and soil degradation have become critical challenges, particularly in regions like Punjab, where the water table has dropped drastically in recent decades. Additionally, agriculture contributes to 14% of India's greenhouse gas emissions, with rice cultivation and fertilizer overuse being major contributors. Methane emissions from livestock and the environmental contamination from excess fertilizers further exacerbate the situation.

Gulati advocated for the repurposing of harmful subsidies, particularly those supporting fertilizers and food production, which currently harm the environment and public health. He called for these subsidies to be realigned to promote sustainable practices, such as reducing nitrous oxide emissions through precision agriculture and fertigation. He also highlighted the potential of innovations like drip irrigation and solar energy in agriculture to conserve water and energy resources. Drawing inspiration from the success of India's dairy sector, Gulati suggested using institutional innovation and public-private partnerships to scale up sustainable agricultural practices. He stressed the importance of creating cooperative models to manage power generation and sale, allowing farmers to benefit from solar energy production.

Both Dr. Mathur and Dr. Gulati emphasized that achieving agricultural sustainability in the face of climate change requires a collaborative approach involving policymakers, farmers, industry leaders, and financial institutions. They stressed the importance of creating a critical mass of innovation and ensuring adequate financing to scale up sustainable practices. Instead of reducing subsidies, they advocated for repurposing them to support diversified

crops, reduce emissions, and address pressing environmental challenges. The focus on solar energy, precision agriculture, and policy realignment was seen as crucial for ensuring food security, improving farmer incomes, and mitigating the environmental impacts of modern agriculture. Ultimately, the event highlighted that sustainable agricultural transformation will depend on integrating new technologies, fostering innovation, and aligning policies with environmental and economic goals to build a resilient agricultural sector.

Panel 1 – Adapting Agriculture to Climate Change

This panel, moderated by Mr. S. Vijay Kumar from TERI, brought together diverse perspectives on how Indian agriculture can adapt to the increasing challenges posed by climate change. The discussion began with insights from Dr. Ajay Mathur and Dr. Ashok Gulati, who emphasized a critical shift in global climate strategies from mitigation to adaptation. They highlighted that adaptation efforts are especially crucial for vulnerable communities and sectors, like agriculture, food security, and water management. Dr. Gulati also noted the past mistakes in managing natural resources, which have reduced the adaptive capacities of farming communities.

Reshma Anand, Regional Director of the Ford Foundation, brought attention to the often-overlooked human capital in agriculture, particularly women farmers. She stressed the need for more inclusive policy frameworks and highlighted that women, despite being central to agricultural work, are frequently excluded from climate adaptation discussions. Anand advocated for a systemic, integrated approach to managing land, water, and soil collectively, moving away from fragmented efforts that hinder meaningful adaptation. She pointed out that farmers' resilience can be enhanced through community-driven planning, where participatory processes allow local voices to shape climate responses. She also underscored the need for behavioural changes in farming practices, facilitated by aligning financial incentives and policy support to encourage sustainable approaches.

Ashis Mondal, Managing Director of Ploughman Agro Pvt. Ltd., addressed the vulnerability of farming communities, noting that agriculture contributes only 14% to India's GDP, while farmers' incomes increasingly depend on non-agricultural sources. Despite this, he pointed out that Indian farmers have always shown resilience by adopting new technologies since the 1960s. For effective adaptation, Mondal stressed the need for affordable, scalable solutions tailored to different village contexts. He also emphasized the role of a conducive policy environment that prioritizes climate adaptation, citing the watershed approach as an example of an effective policy that has fallen out of priority but should be revived. Market dynamics are also crucial, with companies now more inclined to pay premiums for sustainably produced commodities, driven by the growing importance of ESG (Environmental, Social, and Governance) standards and carbon neutrality. Institutional support, particularly from cooperatives, self-help groups (SHGs), and farmer producer organizations (FPOs), is essential for scaling adaptation strategies across rural regions.

Roshan Lal Tamak, Executive Director and CEO of DCM Shriram Ltd.'s Sugar Business, discussed the private sector's role in promoting climate adaptation. He shared how DCM

Shriram is working with smallholder farmers through multi-stakeholder partnerships, including collaborations with organizations like the International Finance Corporation and technology providers. These partnerships focus on promoting good agricultural practices, improving water use efficiency, supporting social health, and fostering local entrepreneurship. Tamak highlighted the tangible impacts of these efforts, such as saving 756 billion liters of water over seven years in the company's operational areas, establishing soil testing labs, and developing compost pits to enhance soil health. Importantly, Tamak emphasized the need to integrate both traditional practices like mulching and modern technologies, such as precision farming tools, to create a balanced, sustainable approach to farming. He also stressed the importance of gender inclusion, ensuring that women are active participants in these adaptation strategies.

Mr. Avinash from Niti Aayog highlighted the promising technologies that can help farmers adapt to climate change. These include early warning systems for extreme weather events, the development of climate-resilient crop varieties, and solar-powered irrigation schemes under the PM-KUSUM initiative. However, he also pointed out a significant gap between the availability of these technologies and their adoption by smallholder farmers. To bridge this gap, farmers require handholding support, which can be provided through dedicated agricultural extension services and better coordination between government schemes and local agencies. Avinash also emphasized the need to conduct climate audits of existing government programs, such as MNREGA, to align them with adaptation and mitigation objectives. He pointed out that while agriculture's direct contribution to GDP may be relatively small, its broader economic influence on industries like textiles, machinery, and transportation makes it a crucial sector for national climate strategies.

In conclusion, the panel reinforced the need for a holistic, multi-dimensional approach to make Indian agriculture more resilient to climate change. Mr. Vijay Kumar wrapped up the session by recognizing the central role that women and local communities play in leading adaptation efforts. He stressed that a successful adaptation strategy must combine scientific, financial, and human capital, while also tailoring solutions to address region-specific challenges, such as coastal regions, hill areas, and the central highlands. Watershed management emerged as a critical element in improving resource bases and enhancing resilience, especially in areas prone to water scarcity. Ultimately, the session underscored the importance of collaboration across sectors—government, private industry, civil society, and local communities—to implement adaptive strategies effectively. By leveraging both modern technologies and traditional practices, fostering inclusive participation, and ensuring policy alignment, the panellists believed that Indian agriculture could be made more robust and climate resilient.

Panel 2 – Climate Mitigation in Agriculture

The second panel discussion delved into the complexities of climate mitigation in agriculture, addressing the dual nature of the sector as both a significant contributor to emissions and one highly vulnerable to climate change impacts. Moderated by Apoorve Khandelwal, the panel brought together experts Mr. Satyabrata Acharyya, Mr. Karan Mangotra, and Mr. Raj Ganguly, who shared insights into how agriculture, which accounts for 22-23% of India's

emissions (considering irrigation and mechanization), can evolve into a more sustainable and resilient sector.

Key Challenges:

1. **Investment Gaps:** Over the past 15-20 years, investment in rural development has significantly decreased, particularly in areas critical to smallholder farmers. This funding gap limits the scope of sustainable agriculture programs and hinders rural economies, making it difficult to drive climate adaptation measures effectively.
2. **Agricultural Extension Services:** The panel pointed out the severe inadequacy of agricultural extension services at the grassroots level, particularly in India's block and panchayat regions. Farmers are often left without vital information and support, which is essential for adopting climate-resilient and sustainable farming techniques.
3. **Women in Agriculture:** The discussion highlighted the systemic challenges women face in agriculture. As more men migrate to cities for work, women increasingly manage farms. However, limited land ownership among women restricts their access to credit, subsidies, and government support programs. This barrier impedes their ability to adopt sustainable practices or improve their productivity, even though they play a crucial role in farming communities.
4. **Energy Access:** The need for affordable, reliable energy is a critical enabler of sustainable agricultural practices, particularly for smallholder farmers. However, access to such energy remains inconsistent, which limits farmers' capacity to use energy-efficient technologies, such as solar-powered irrigation or mechanization.
5. **Demonstration Projects:** The panelists emphasized the importance of on-ground demonstration projects that showcase the efficacy of sustainable practices. Farmers are more likely to adopt new methods if they can witness successful models in action. These projects act as critical tools for building trust and driving behavioral change within farming communities.

Potential Solutions:

1. **Innovative Financial Models:** To meet the energy and infrastructure needs of rural communities, the panel discussed the potential of customized financial products tailored to decentralized solar solutions and other sustainable technologies. These products can alleviate the financial burden on farmers, making it easier to invest in sustainable practices.
2. **Gender-Sensitive Policies:** Addressing the inequities women face in agriculture was a core topic. The panel called for policies that recognize women as key stakeholders, ensuring they have access to land, credit, and technical training. Empowering women with these resources could unlock new opportunities for sustainable farming.
3. **Holistic and Integrated Approaches:** The discussion underscored the interconnectedness of various challenges, from energy access to agricultural extension, gender equity, and financing. To address these challenges effectively, the panel advocated for a systemic

approach that integrates multiple solutions simultaneously, instead of isolated, sectoral interventions.

4. Scaling Demonstration Projects: Expanding the reach of successful demonstration projects was identified as a crucial strategy. These pilot projects can serve as models for broader adoption of sustainable practices across diverse regions, helping farmers transition to climate-resilient systems at scale.

Future Outlook:

The panel expressed a mix of optimism and caution regarding agriculture's potential role in climate mitigation. While there is hope that agriculture can become a significant part of India's Nationally Determined Contributions (NDCs) by 2030, there remains uncertainty due to current policy and investment gaps. A sense of urgency was emphasized, particularly around the need for collective action to integrate agriculture more effectively into India's climate strategy.

Extended Discussion on Challenges:

In the second part of the panel discussion, several additional challenges were highlighted:

1. Fragmented Approach to Agricultural Sectors: Over time, the integration between agriculture, livestock, fisheries, and horticulture has weakened, leading to fragmented policy and practice. This loss of integration makes it difficult to deliver holistic solutions that could optimize resources such as soil, water, and bio-resources at the local level.
2. Declining Interest in Agriculture: There is a growing disinterest in farming among educated men, primarily because agriculture is perceived as non-remunerative. This poses a long-term challenge for the future of farming in India, as fewer young people see agriculture as a viable career.
3. Gender Disparities: The panel reiterated the structural disadvantages women face in agriculture, including a lack of access to resources, training, and decision-making roles. Without addressing these disparities, women's potential as drivers of sustainable agricultural practices remains underutilized.

Opportunities and Innovations:

1. Innovative Financing and Private Sector Investment: The private sector can play a pivotal role in financing sustainable agriculture projects, such as land restoration and agroforestry. These projects not only create livelihood opportunities for rural communities but also contribute to climate mitigation by enhancing carbon sequestration on degraded lands.
2. Tailored Models for Local Communities: The panel stressed the importance of designing models specific to local contexts, which incorporate community engagement, training, and livelihood diversification. These models can effectively address the unique challenges of different regions, offering scalable solutions that work within local ecosystems.

3. Carbon Sequestration and Agroforestry: Initiatives such as agroforestry on degraded lands present a win-win solution by providing both economic opportunities for farmers and contributing to carbon capture efforts, making these projects attractive to investors.

4. Participatory Planning: Ensuring local communities have a voice in planning and implementing agricultural and land restoration projects can enhance the sustainability and success of these initiatives. Community ownership encourages long-term commitment to sustainable practices.

5. Empowering Women Farmers: Addressing the barriers faced by women farmers through targeted policies can unlock their potential as change agents in agriculture. Providing them with access to training, land, and credit would not only support gender equity but also drive the adoption of sustainable practices on a larger scale.

The panel concluded with a call for systemic change, greater investment in sustainable agricultural practices, and an urgent push to incorporate agriculture into India's climate mitigation framework. They acknowledged the significant barriers to scaling sustainable agriculture in India, particularly in terms of financial and gender disparities, but also highlighted the vast potential of agriculture to play a transformative role in addressing climate change. Collaborative approaches, innovative financing mechanisms, and empowering women and local communities were seen as key drivers for a resilient and climate-conscious agricultural future.

Panel 3 – Solutions and Showcases: Innovators

Key speakers from various organizations presented transformative models to create more resilient, sustainable, and profitable agricultural systems. Below is an overview of some of the most notable presentations from the event:

Karishma Chand - Urban Farms Co.

Karishma Chand of Urban Farms Co. emphasized the transformative potential of combining science-based regenerative agriculture with innovative operational models to build a resilient food system in India. Urban Farms Co.'s Vision is to reinvent the food system by creating resilience against climate change and promoting environmental and societal health. The company's mission is to provide nutrient-dense food across India while restoring soil biodiversity and ensuring long-term land productivity.

Urban Farms operates through a hub-and-spoke system, establishing hubs outside cities and forming clusters with independent farms. These hubs supply inputs, technical guidance, and quality control, while also collecting biomass to prevent pollution and enrich the soil. By employing regenerative agricultural practices, the farms focus on improving soil health and biodiversity through chemical-free farming. Farmers are supported with market linkages and guaranteed buybacks, ensuring profitability while fostering transparency through a traceability system.

The company's success began with the Araku Coffee project, which has become a model for replication. Urban Farms plans to expand these practices to more clusters, including farmer producer organizations (FPOs) and micro-entrepreneurs. They integrate science and technology, using soil health tests and partnerships with institutions like Cornell University to develop innovative bio inputs. The company's vision includes reducing the carbon footprint of agricultural activities and engaging communities to promote sustainable practices.

Saumya - Kheyti

Saumya, co-founder of Kheyti, introduced the "Greenhouse in a Box" solution designed for smallholder farmers. The modular and affordable greenhouses help farmers like Reshma overcome the challenges posed by climate change by protecting crops from pests, unseasonal rains, and harsh weather. These greenhouses significantly improve crop yields, as demonstrated in Kheyti's trials comparing open-field cucumber farming with greenhouse farming.

Kheyti has successfully reduced the cost of the greenhouse from 2-3 lakhs to 75,000 rupees, making it accessible to more farmers. The modular approach allows farmers to start small and expand as needed. Additionally, Kheyti provides a comprehensive support system that includes installation, maintenance, agronomic advice, and access to agricultural inputs.

The impact of the Greenhouse in a Box extends beyond economics—its drip irrigation system conserves water, and its controlled environment makes farming more climate-resilient. Kheyti has expanded to 5,000 farmers across seven Indian states and aims to reach 1 million farmers in the next five years. They emphasize the need for government collaboration to scale the solution and move towards sustainable funding models.

Puran Singh - EF Polymer

Puran Singh, co-founder of EF Polymer, presented their biodegradable super absorbent polymer (SAP), an organic product that can absorb water up to 100 times its weight and release it gradually to the soil. Certified organic by global agencies like the USDA, this polymer helps improve water retention, reduces the need for irrigation, and enhances nutrient uptake by plants.

The polymer is easy to apply and economically viable, with farmers saving up to 30-40% on water and 10-20% on fertilizers. Field trials across different agro-climatic zones in India have shown significant yield improvements, making it a valuable solution for regions prone to drought. EF Polymer plans to expand to reach 500,000 farmers within five years and explore applications in other industries.

Ganesh Bhare - S4S Technologies

Ganesh Bhare, co-founder of S4S Technologies, presented their innovative solar dehydration technology, which converts perishable produce into shelf-stable food ingredients. This technology addresses the issue of post-harvest losses, which accounts for nearly 40% of agricultural waste in India.

The solar dryers empower women farmers by enabling them to process food locally and become micro-entrepreneurs. S4S Technologies has set up 3,000 processing centers, involving over 400,000 farmers. The model has been particularly successful with women farmers, promoting social and economic inclusivity while reducing carbon emissions through solar energy use. The processed products are sold to companies like Unilever, highlighting the scalability of the model.

S.P. Jadhav - Jain Irrigation Systems

S.P. Jadhav from Jain Irrigation Systems discussed the company's advanced irrigation solutions aimed at improving water efficiency in agriculture. With over 80% of agricultural water used for irrigation, Jain Irrigation focuses on converting rainfed areas into irrigated areas through drip and subsurface irrigation. These systems reduce water waste, enhance crop yields, and cut down methane emissions in rice cultivation.

Jain Irrigation has also integrated solar-powered irrigation, reducing farmers' reliance on conventional energy sources. The company is working on breaking down barriers to adoption by providing training and demonstrating the benefits of advanced irrigation technologies.

Sumeet Malhan - PRESPL

Col. Sumeet Malhan from Punjab Renewable Energy Systems Private Limited (PRESPL) tackled the issue of agricultural waste burning, which contributes to air pollution. PRESPL aggregates and processes biomass into biofuels, replacing fossil fuels like coal and diesel. Their business model involves village-level entrepreneurs collecting biomass from farmers, which is then processed into bio-CNG and briquettes.

PRESPL's operations not only reduce environmental pollution but also provide economic benefits to farmers and entrepreneurs. Their projects have gained recognition from international bodies, including the World Bank.

Abhijit Shivraj Rao Naik - Yashwant Group of Industries

Abhijit Shivraj Rao Naik of Yashwant Group discussed their biogas initiative, which involves installing household biogas plants for milk-producing farmers. This project provides renewable energy for cooking, reducing greenhouse gas emissions and improving health outcomes for families.

The company has implemented an innovative financing model using microfinance and carbon credits, making biogas plants accessible to small and marginal farmers. Despite policy and financial challenges, the biogas initiative has successfully promoted sustainable energy use and supported local manufacturing and employment.

These presentations at Planet Dialogue 2024 emphasized the importance of integrating technology, community collaboration, and sustainable practices to transform Indian

agriculture and make it resilient to climate change. Through innovative models, these organizations are working to empower farmers, improve livelihoods, and reduce the environmental impact of agriculture.