



RESEARCH PROGRAM ON
**Climate Change,
Agriculture and
Food Security**



DEVELOPING RESILIENT AGRICULTURE TO CLIMATE CHANGE IN INDIA

ITC-CCAFS Climate-Smart Village Approach

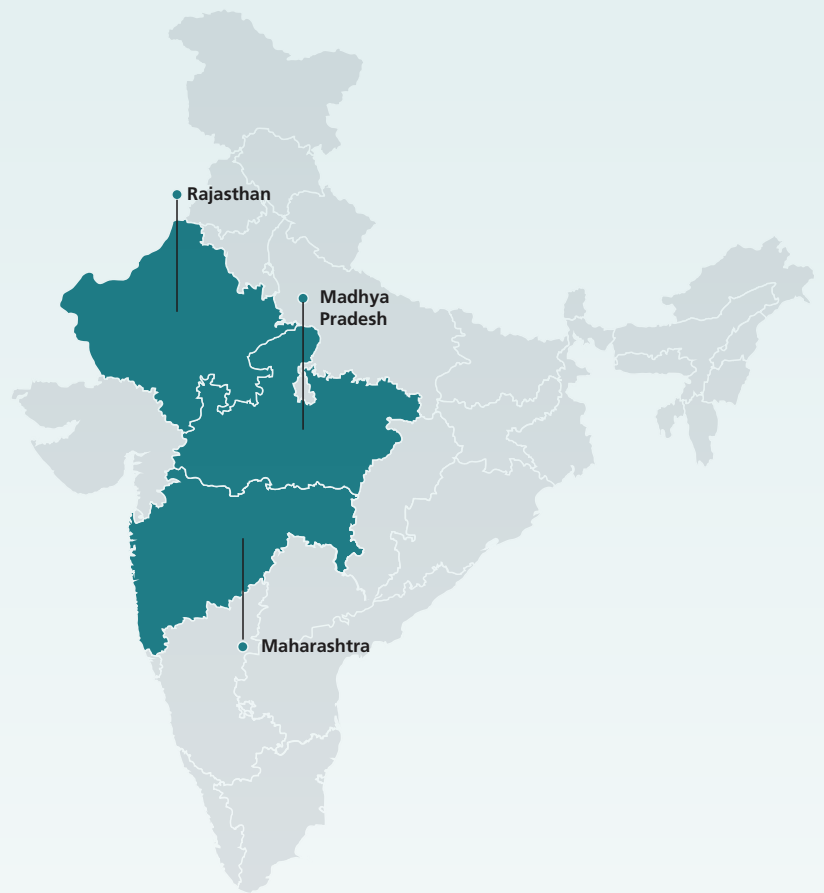
Project Background

As one of India's foremost private sector companies with a diverse portfolio of businesses, ITC Limited is famous for its 'Triple Bottom Line' approach. This entails a belief that any company's performance should be measured by its ability to attain Economic, Environmental and Social gains through its business models. Highly invested in agri-business, ITC's outreach areas in India span across diverse agro-ecological zones, some being Madhya Pradesh, Maharashtra and Rajasthan which fall under categories of high to very high vulnerability to climate change impacts upon the agriculture systems. Common problems across villages in ITC outreach areas are high prevalence of crop yield gap and low resilience to the negative impacts of climatic variabilities affecting the entire value chain in agriculture.

The CGIAR Research Program on Climate Change, Agriculture and Food security (CCAFS) brings to the fore expert global and regional knowledge to help mitigate the adverse impacts of climate change upon agriculture systems and ensure a resilient sector. By converging global scientific knowledge within local contexts, it seeks to attain goals of food security under the new realities of climate change by deploying various technologies, models and approaches. The Climate-Smart Village (CSV) model has been designed as an integrated and participatory approach to scale out a portfolio of climate-smart agricultural technologies and practices in different agro-ecological zones across the globe.

In India, one of the routes for scaling the CSV approach has been through engagement with the private sector which plays an equally important role in advancing sustainable growth pathways. ITC's 'Mission Sunehra Kal' (MSK) is one such initiative which seeks to strengthen rural livelihoods through its rural retail initiative e-Choupal, wasteland development through social forestry, soil and moisture conservation programmes, livestock development initiatives, building skills and social infrastructure. Against this backdrop of common goals for attaining sustainable growth, rural livelihood strengthening and environmental sustainability, ITC and CCAFS came together to collaborate on a project titled '**Developing Resilient Agriculture to Climate Change in India**'.

Project Locations



Project Goal

To Converge ITC's Mission Sunehra Kal and CCAFS's CSV approach to promote climate-smart interventions and build climate-resilient agriculture by scaling out the interventions to reach scale.

Project Activities

- Undertake assessment of agriculture and climate risks, and identify climate-smart agriculture technologies, practices and services to improve agricultural production and minimize risks in the outreach villages;
- Prioritize technological options based on stakeholders (farmers, local government, NGOs and community based organizations) preferences and integrate with MSK activities in the outreach villages;
- Strengthen capacities of local staff of ITC and its local partner organizations to implement, monitor and evaluate technological interventions in the farmer's field and communities; and
- Generate evidences of improving farm productivity and income, resource use efficiency and thereby build resilience in agriculture in the outreach villages.

CSV Framework

Addressing the need for proven and effective climate-smart agricultural options, CCAFS has developed the Climate-Smart Village (CSV) approach as a means to agricultural research for development (AR4D) in the context of increasing climate risks. It seeks to fill knowledge gaps and stimulate scaling of climate-smart agriculture (CSA). The CSV approach is founded on the principles of participatory action research for grounding research on appropriate and location/context-specific enabling conditions, generating greater evidence of CSA effectiveness in a real-life setting and facilitating co-development of scaling mechanisms towards landscapes, subnational and national levels. In establishing a CSV-AR4D site, the very first step is to build trust and partnerships amongst diverse stakeholders; and to attain agreements and buy-in to a common approach. Once partners have agreed on the establishment of a CSV site, the major steps include baseline assessment, identification and context specific prioritization of CSA interventions, evaluation and development of portfolios of weather resilient interventions, and scaling up through policies and institutions, and scaling out to large areas through farm-to-farm and ICT-based approaches.

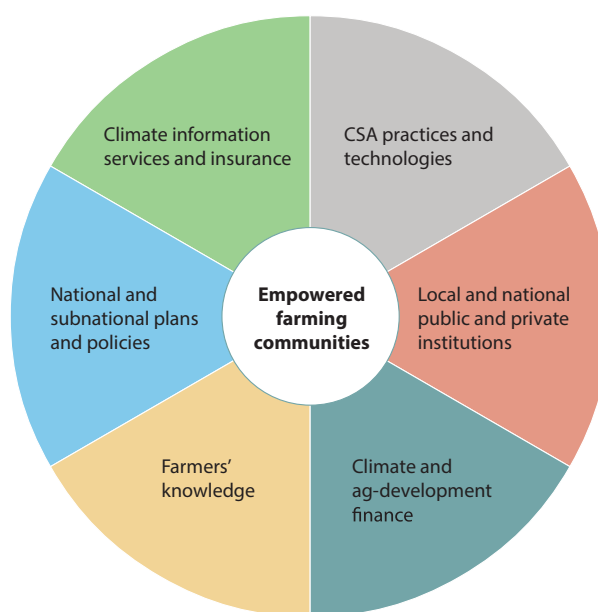


Figure 1: Components considered in the CSV-AR4D sites

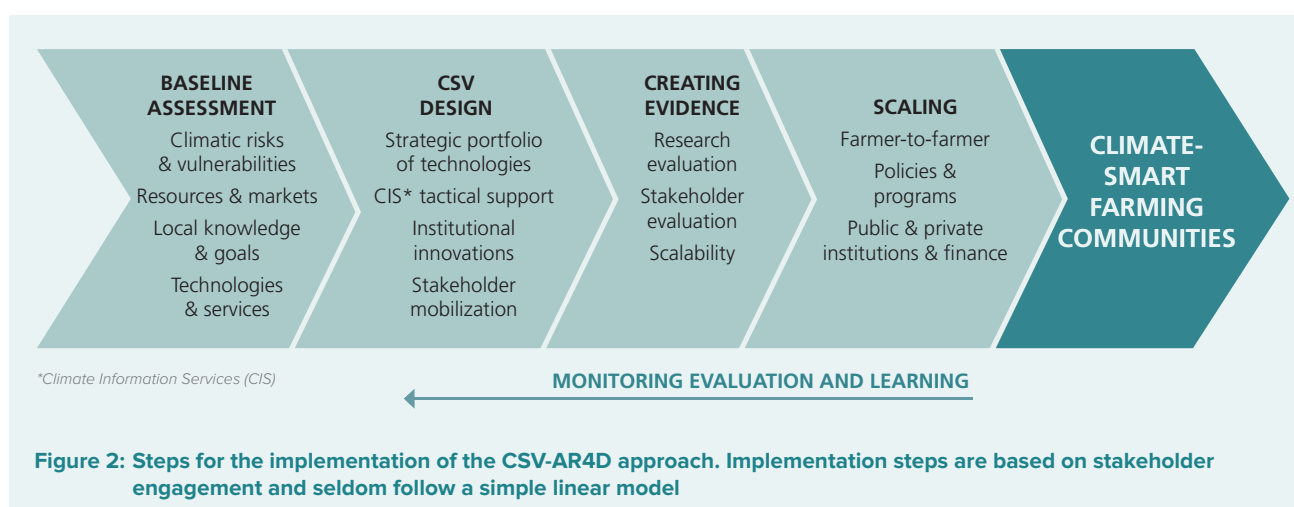


Figure 2: Steps for the implementation of the CSV-AR4D approach. Implementation steps are based on stakeholder engagement and seldom follow a simple linear model

ITC-CAFS Partnership Model

In the first phase (2016-2018), ITC's outreach areas in Madhya Pradesh, Maharashtra and Rajasthan were focused on, to implement a range of CSA technologies and practices integrating them with the MSK program. Figure 3 below presents an impact pathway of the 'MSK and CSV integrated' model.

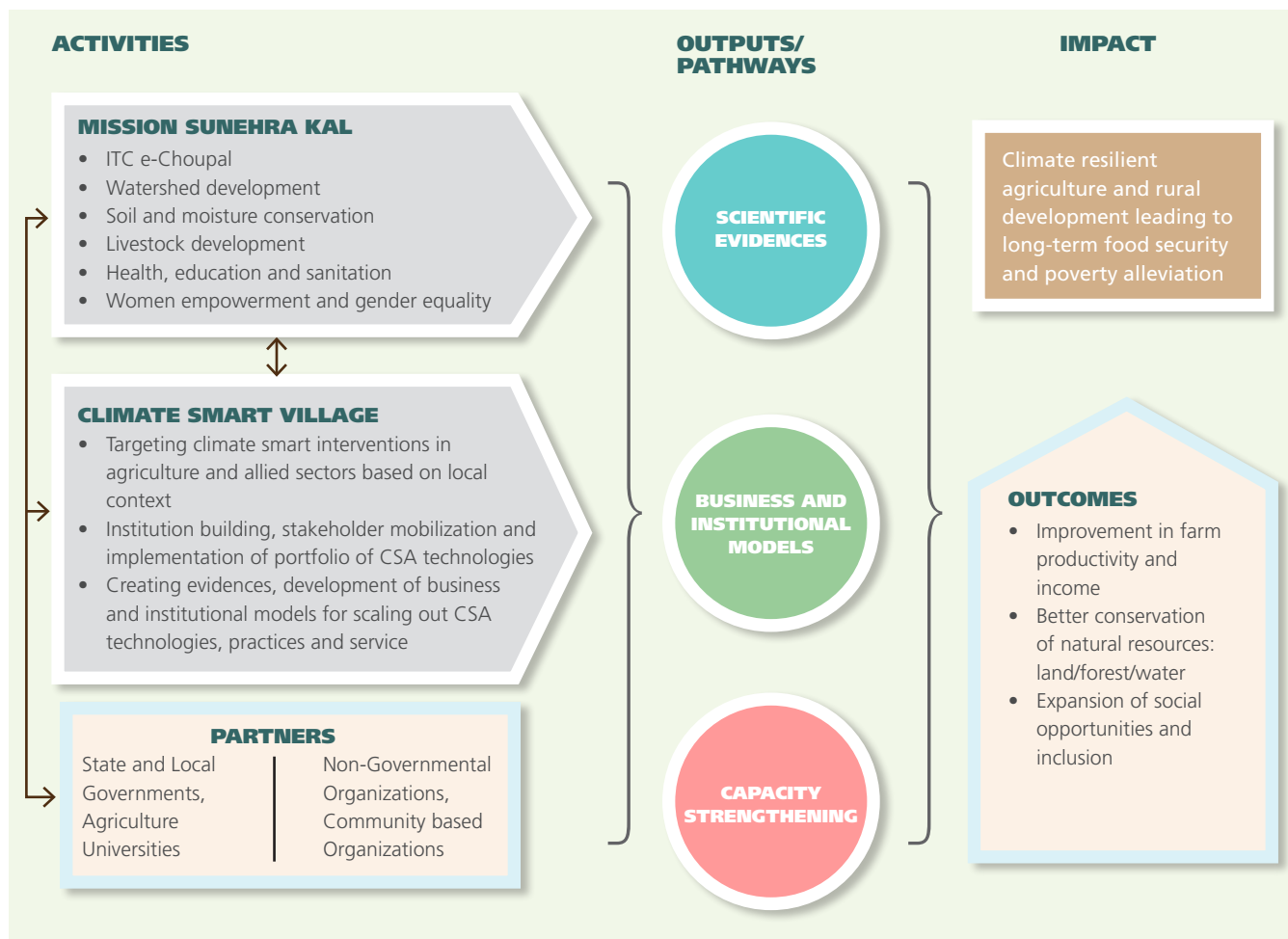


Figure 3: Impact pathway of the MSK and CSV integrated model

Type of Farmers

Field level climate-smart interventions were implemented with three types of farmers:



Super-Champion Farmers:

Large landholders having the capacity to implement large portfolio of technologies and practices, proactive and financially well-off, and can influence other farmers in the village and play a leadership role in developing a climate resilient agricultural production system.



Champion Farmers:

Medium to large land holders who can implement a relatively limited number of technologies and practices in comparison to Super-Champions.



CSA Farmers:

Small landholders and resource poor farmers who can implement a very limited set of technologies and practices.

Project Villages

In the first phase, five districts were selected in each state: **Madhya Pradesh** (Chhindwara, Indore, Sehore, Ujjain and Vidisha), **Maharashtra** (Ahmadnagar, Amaravti, Pune Ratnagiri, and Satara) and **Rajasthan** (Baran, Bundi, Jhalawar, Kota and Pali). These districts vary in relation to agro-ecological and socio-economic settings and prevalence of climatic risks in different cropping seasons. Piloting of CSA interventions was started in Madhya Pradesh (30 villages), Maharashtra (22 villages) and Rajasthan (21 villages).

Prioritization of CSA Technologies for Implementation

Considering the possibility of many climate-smart interventions in the ITC outreach areas, a comprehensive list of technologies and practices suitable for agriculture production systems was developed. Out of those, stakeholders (local farmers, extension agencies, partner NGOs, officers of the line departments of the state government and local resource persons) in Madhya Pradesh, Maharashtra and Rajasthan prioritized a range of locally contextualized climate-smart interventions represented in Table 1 below.

TABLE 1

Yield Improving Technologies/Practices	Climatic Risk Reduction Technologies/Practices
Improved seed including drought, flood, diseases and pest resistant varieties (Seed-Smart)	Improving water use efficiency: irrigation scheduling, micro-irrigation (sprinkler, drip, furrow) (Water-Smart)
Precision nutrient management based on soil test, leaf color chart and GreenSeeker, and intercropping and crop rotation (Nutrient-Smart)	Contingent crop planning including change in sowing time and short duration varieties (Knowledge-Smart)
Broad Bed Furrow (Water-Smart)	ICT based climate information, agro-advisory and market information (Weather-Smart)
Intercropping with legumes, vegetable integration (Nutrient-Smart)	Crop insurance (Weather-Smart)
Irrigation and drainage management including rainwater harvesting, construction of small check dams, aquifer recharging, and tube wells (Water-Smart)	Farmers capacity building (Knowledge-Smart)
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Agro-forestry and fodder tree/grass (Carbon Smart)	

These CSA portfolios supplement Mission Sunehra Kal's activities in villages to build resilient agriculture to climate change and variability. A total of 73 Super Champion and 1,460 Champion farmers have implemented CSA interventions in the villages.

Model of Implementation

Implementation pathway of the integrated ITC-CCAFS model follows a 'hub and spoke' model wherein evidences are generated in the 'hub' (comprising of farmer groups) by implementing different portfolios of CSA interventions. These evidences then get disseminated via various mediums like on-site demonstrations, participatory videos, capacities trainings etc. as 'spokes' from the hub to reach other farmers in the same village or near-by villages.

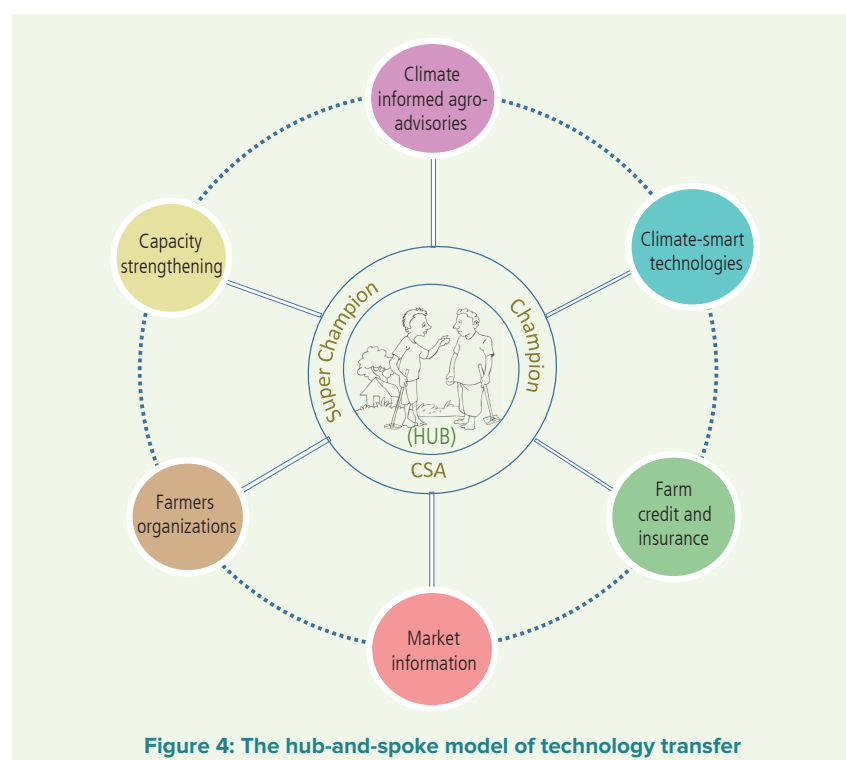


Figure 4: The hub-and-spoke model of technology transfer



Progress and Achievements so Far

CSA interventions in the farms of Super-Champion and Champion farmers were evaluated based on their contribution in improving crop productivity and income compared to baseline (before interventions). A significant level of improvement in crop yields was observed in soybean, wheat and paddy in all project districts (Summary Figure 5 and 6):

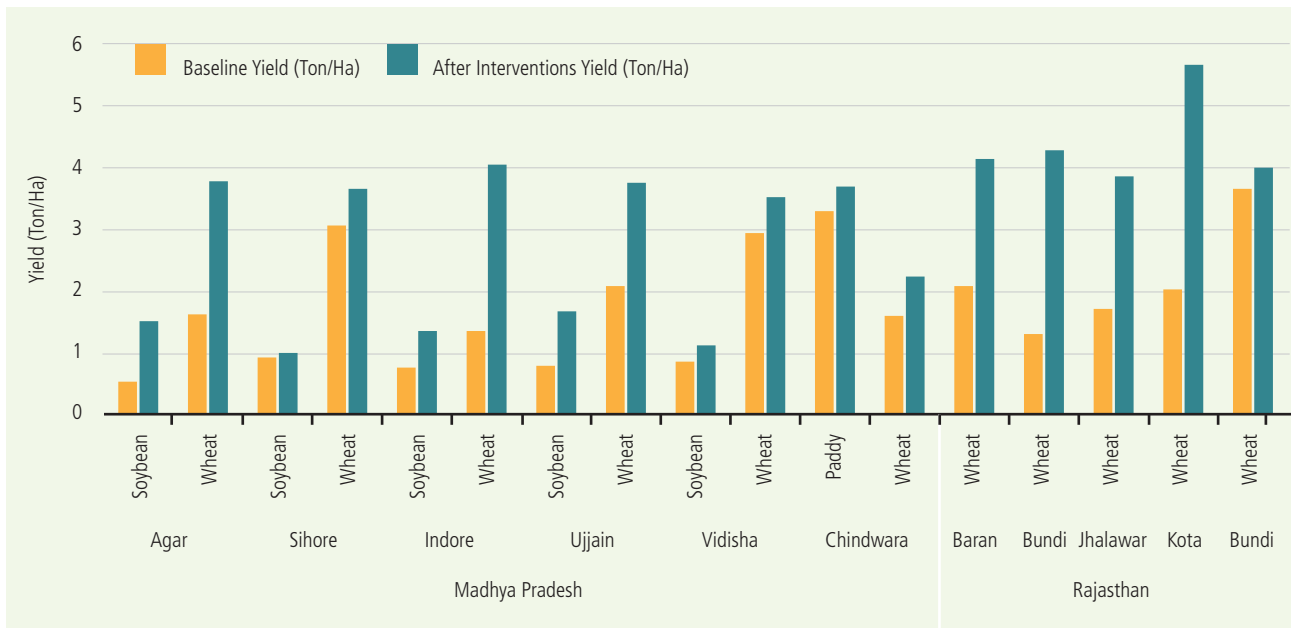


Figure 5: Change in yield (ton/ha) in the project districts

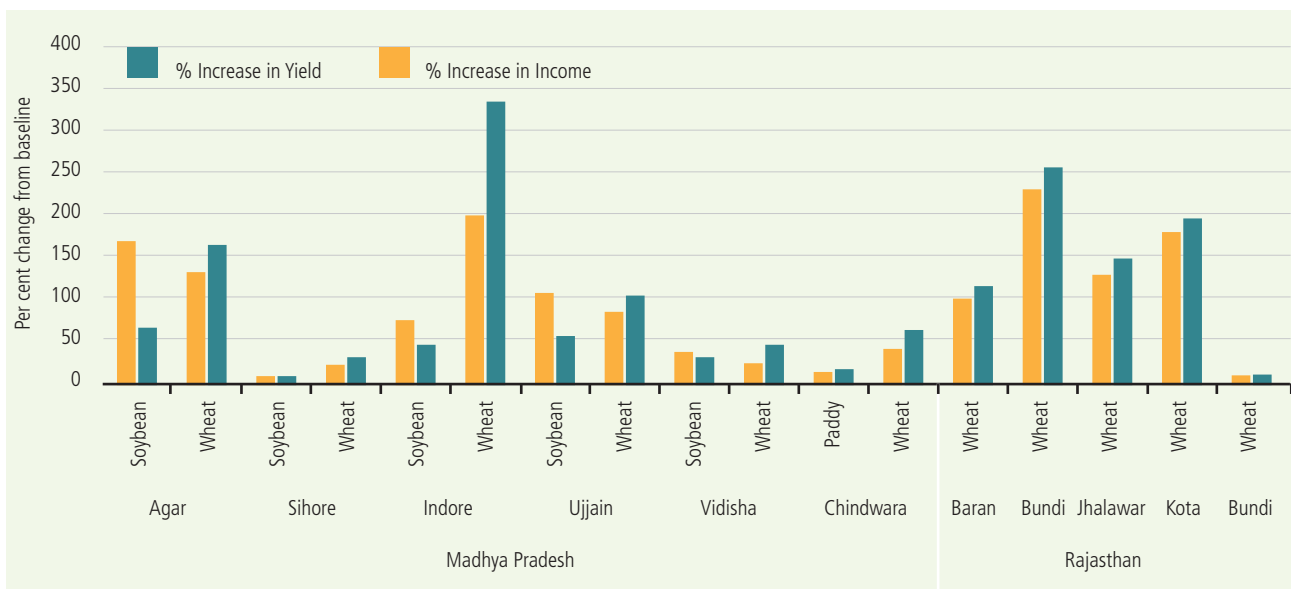


Figure 6: Change in yield and income (% from baseline) in the project districts



Supplementary Project Benefits

- **Information Generation:** Through mediums of e-choupal and farmer's Whatsapp groups, beneficiaries are receiving regular information on CSA technologies and market access. This dissemination network is helping in the percolation of such information among the larger farming community, eventually helping improve selection of appropriate technologies and farm-based decision making.
- **Institution Building:** The project is facilitating the creation of new farmer's groups across CSVs, helping coordination among existing groups while also institutionalizing operational models like Custom Hiring Centers for farm machinery. Five different types of local institutions being promoted in the CSVs are:
 1. Jal-Jameen- Jangal Samiti- Institution for water-land-forest management
 2. Women Farmers' Livelihood Groups
 3. Farmer Producers Organizations
 4. Custom Hiring Centers
- **Capacity Training:** Training and capacity building exercises for the field staff of ITC and local organizations is being undertaken regularly, helping them in the processes of baseline survey, technology identification and prioritization, selection of farmers, implementation of CSA technologies, field demonstrations, monitoring and evaluation among others, in the outreach areas.



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The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) is a strategic partnership of CGIAR and Future Earth, led by the International Center for Tropical Agriculture (CIAT).

CCAFS defines and implements a uniquely innovative and transformative research program that addresses agriculture in the context of climate variability, climate change, and uncertainty about future climatic conditions.

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Climate Change, Agriculture and Food Security (CCAFS), South Asia

Borlaug Institute for South Asia (BISA)

The International Maize and Wheat Improvement Center (CIMMYT)

New Delhi Office, B Block, 2nd Floor, NASC Complex

Dev Prakash Shastri Marg, Pusa; New Delhi-110012, India

www.ccafs.cgiar.org/regions/south-asia