

AGRICULTURE FORUM FOR TECHNICAL EDUCATION OF FARMING SOCIETY

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Climate-Smart Agriculture Farming under Changing Climate

Authors

**Dr. Laxman Navi¹, Yashaswini S. N²,
Sachin Panjabrao Kolhe³, Siddharth Saroha⁴,
Samar Thakuria⁵**

¹Technical Assistant, Department of Agronomy,
Agricultural Research Station, Sankeshwar.

²Ph.D Scholar, Department of Agronomy, University of
Agricultural Sciences, College of Agriculture, GKVK,
Bangalore.

³Subject Matter Specialist (Agriculture Extension), Krishi
Vidyan Kendra, Sangli-I.

⁴Ph.D Research Scholar, Department of Agronomy,
College of Agriculture, Chaudhary Charan Singh Haryana
Agricultural University Hisar Haryana.

⁵Ph.D Research Scholar, Department of Agricultural
Extension Education, School of Agricultural Sciences,
Medziphema Campus, Nagaland University.

INTRODUCTION

Climate change is posing serious challenges to agriculture through rising temperatures, erratic rainfall, droughts, and floods, which directly affect crop productivity and stability. These changes increase the risk of crop failure and threaten farmers livelihoods. Climate-Smart Agriculture (CSA) has emerged as an innovative and sustainable approach to address these challenges. It focuses on adapting farming practices to changing climatic conditions while maintaining productivity. CSA promotes efficient use of resources such as water, soil, and nutrients. It also emphasizes reducing greenhouse gas emissions from agricultural activities. Adoption of improved technologies, resilient crop varieties, and better management practices are key components of CSA. This approach helps in enhancing farm resilience and minimizing climate-related risks. It also ensures long-term sustainability of agricultural systems. Overall, CSA plays a vital role in achieving food security and supporting farmers under changing climate conditions.



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2. What is Climate-Smart Agriculture

Climate-Smart Agriculture (CSA) is an integrated and sustainable approach designed to address the challenges of climate change in agriculture. It focuses on enhancing farm productivity while ensuring environmental sustainability and resilience. CSA promotes practices that help farmers adapt to changing climatic conditions such as droughts, floods, and temperature fluctuations. At the same time, it aims to optimize the use of natural resources like water, soil, and energy. A key objective of CSA is to increase agricultural productivity in a sustainable manner. It also emphasizes building resilience in farming systems to withstand climate-related stresses. Additionally, CSA seeks to reduce greenhouse gas emissions wherever possible through improved management practices. By combining adaptation and mitigation strategies, CSA ensures long-term food security and livelihood stability for farmers.



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3. Key Features of Climate-Smart Agriculture (CSA)

- Enhances crop productivity under climate stress conditions such as drought, heat, and floods
- Promotes efficient use of water, nutrients, and energy resources
- Encourages eco-friendly and sustainable farming practices
- Supports both climate adaptation and mitigation strategies
- Strengthens farmers' resilience against extreme weather events
- Improves soil health and conserves natural resources
- Reduces greenhouse gas emissions from agricultural activities
- Ensures long-term sustainability and food security



4. Important Climate-Smart Practices

- **Crop diversification & rotation:** Reduces risk of crop failure and improves soil fertility and health
- **Agroforestry:** Integrates trees with crops to enhance sustainability and provide additional income

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- **Efficient irrigation (drip/sprinkler):** Saves water, improves water-use efficiency, and increases yield
- **Mulching & conservation agriculture:** Conserves soil moisture and reduces soil erosion
- **Use of climate-resilient varieties:** Helps crops withstand drought, heat, and flood conditions
- **Integrated nutrient management (INM):** Optimizes nutrient use and improves soil productivity
- **Integrated pest management (IPM):** Reduces dependence on chemical pesticides and promotes eco-friendly control methods



5. Benefits of Climate-Smart Agriculture

- **Increases farm productivity and income:** Ensures higher and more stable yields under changing climate conditions
- **Improves soil health and water-use efficiency:** Enhances soil fertility and optimizes use of water resources

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- **Reduces vulnerability to climate risks:** Helps farmers cope with droughts, floods, and temperature extremes
- **Lowers greenhouse gas emissions:** Promotes eco-friendly practices that reduce environmental impact
- **Enhances long-term sustainability:** Supports resilient and sustainable agricultural systems for future generations

CONCLUSION

Climate-Smart Agriculture (CSA) is crucial for ensuring the sustainability of farming under changing climatic conditions. It provides a balanced approach by enhancing productivity while conserving natural resources and protecting the environment. By adopting innovative and sustainable practices, farmers can reduce climate-related risks and improve their livelihoods. CSA also supports efficient use of inputs and promotes resilience against extreme weather events. With proper awareness, capacity building, and strong policy support, CSA has the potential to transform agriculture into a more resilient, profitable, and sustainable system for the future.

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