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# Can Climate Smart Agriculture Propel Food Security?

Issues & Challenges



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## What is Climate Smart Agriculture?

**Climate-smart agriculture (CSA) is an integrative approach to address the interlinked challenges of food security and climate change”. Its three objectives are:**

- **Sustainably increase agricultural productivity, to support equitable increases in farm incomes, food security and development**
- **Adapt and build resilience of agricultural and food security systems to climate change at multiple levels**
- **Reduce greenhouse gas emissions from agriculture (including crops, livestock and fisheries). (FAO 2014)**

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## CSA and Policy Linkages between Mitigation and Adaptation

There is a positive linkage between Adaptation and mitigation centered around four key socio-economic policy areas:

- **Harnessing human capital through creating productive employment and addressing migrant dilemmas**
- **Managing water resources**
- **Ensuring food security**
- **Mitigating climate change**

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## What Were The Achievements Of The First Green Revolution?

- **Increase in Per Hectare Productivity:**
  - **Development of Industries:**
  - **Prosperity to Farmers:**
  - **Effect on Consumers:**
  - **Effect on Rural Employment:**
  - **Capitalistic Farming:**
- **Negative effects – Salinization, indiscriminate pesticide and fertilizer use, ground water depletion**

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## Effects of Climate Change on Agriculture in India

- Climate variability will impact on actual crop production through shifts in the intensity, duration, and frequency of climate extremes
- Sensitivity of Indian agriculture to rainfall is well known and well established particularly in regard to the dependence of paddy cultivation on the quantum of monsoon rainfall in India.
- Impact of temperature variability on wheat production in India, using data from the States of Punjab, Haryana, and Uttar Pradesh over the period 2010–2014 show - number of days the crop is exposed to temperatures higher than 34°C has a significant effect on the length of the growing season of the crop
- Since length of the growing season is a determining factor in wheat productivity, it is evident that wheat yields are significantly dependent on climate variability. This result is of course in line with the expectations from agriculture science, which we had noted in the previous section.

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## Why do we need climate smart agriculture?

- ❑ As a major user of freshwater and fossil fuels, a significant producer of greenhouse gases and a frequent trigger to deforestation, agriculture is seen as part of the climate change problem.
- ❑ Climate Smart Agriculture (CSA) seeks to reverse that pattern with different emphases according to the current levels of agricultural development.

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## Do We Have The Resources To Implement CSA To Spur A Second And Environment Friendly Green Revolution In India?

Implementing CSA calls for a radical transformation of farming systems:

- Improved Land and water management practices, such as catchment area treatment, preservation of forest, reforestation of upper catchments, riverbank protection and construction of check dams.
- Preparation of catchment area management plans with community participation for each micro-watershed.
- Revival of traditional water management systems for harvesting and conservation of runoff rainwater by the community.
- The community and other stakeholders would be encouraged to invest in reclamation of waste land.

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## How can India lead the Science and practice of Climate Smart- Agriculture?

- Need for effective strategy to address the problems and challenges being confronted by agriculture sector, emphasis on adjusting policies to the new types of technologies, changing demand patterns
- Emphasis on agriculture diversification, increased public investment in agriculture, and motivate States to take required steps to accelerate agriculture growth along with emphasis on technology.
- Ensuring un-interrupted supply of power to rural areas and agriculture sector along with

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## Examples in India of Climate Smart agriculture?

- Climate smart agriculture includes proven practical techniques.
- Raising the organic content of the soil through conservation tillage, its water holding capacity increases, making yields more resilient and reducing erosion.
- Promoting soil carbon capture also helps mitigate CLIMATE CHANGE.
- Integrated soil fertility management that can lower fertilizer costs, increased soil carbon and improved yields.
- CSA gives attention to landscape approaches, for eg. Integrated planning of land, agriculture, forests, fisheries and water to ensure synergies are captured. Example of CSA Meghalaya model.

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## Meghalaya Model: Role Of The Various Agencies In Making Climate Smart Agriculture Practices Successful In India

What is new about CSA is an explicit consideration of climatic risks that are happening more rapidly and with greater intensity than in the past. New climate risks, require changes in agricultural technologies and approaches to improve the lives of those still locked in food insecurity and poverty and to prevent the loss of gains already achieved. CSA approaches entail greater investment in:

- Managing climate risks,
- Understanding and planning for adaptive transitions that may be needed, for example into new farming systems or livelihoods, and
- Exploiting opportunities for reducing or removing greenhouse gas emissions where feasible.

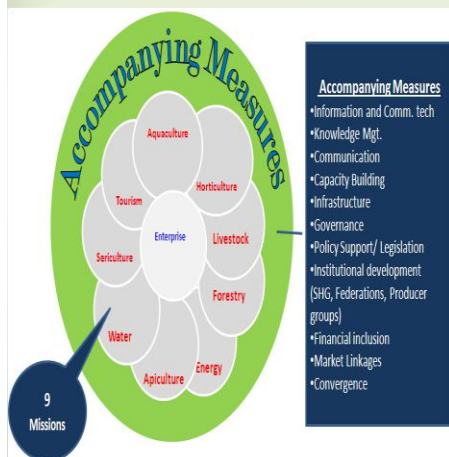
These can be further strengthened by adding better weather forecasting, more resilient food crops and risk insurance to cover losses when the vagaries of weather strike. If yields increase through such practices and become more stable, it results in improved farm incomes. A more stable income helps enhance the adapted capacity of farmers.

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## Meghalaya Model: Role Of The Various Agencies In Making Climate Smart Agriculture Practices Successful In India

This model forms the part of Meghalaya's Integrated Basin Development and Livelihoods Promotion Programme (IBDLP) launched in April 2012.



- The IBDLP programme, launched with inputs from IWF as knowledge partner, is designed around four pillars –
- It is being implemented in a mission mode through twenty over one score missions.
- Every mission is designed to leverage the comparative advantage that Meghalaya has in that sector and to generate livelihood opportunities
- Meghalaya has precise geographic and strategic assets for playing a vital role in promoting South-South Cooperation in water and climate change
- The success of Plus-Environment Model is worth emulating entails vast potential of its being replicated in the neighbouring countries of Bangladesh, Bhutan Nepal and Myanmar.

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## Way Forward

**Climate Smart Agriculture approach requires strengthening governance structures and building incentives and tools for the sustainable development**

- **Improvements in water management schemes at the national level**
- **Comparative advantage of the region to generate livelihood opportunities**
- **Close collaboration between the countries at the local level**
- **A paradigm shift needed in national policies to manage natural resources;**

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