

Climate-Resilient Food Production Systems



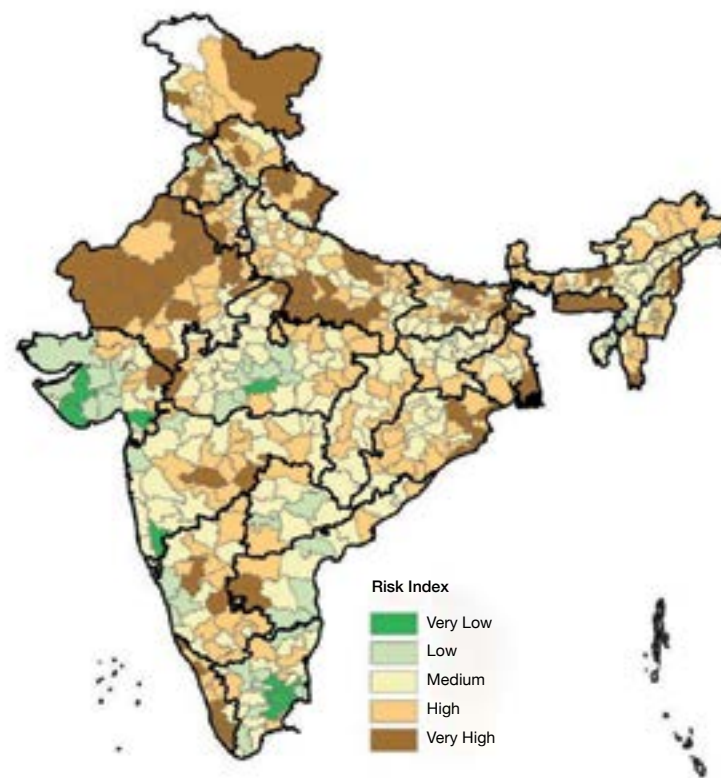
Actionable Area

Appreciate food systems' distinct systemic landscape, and take an integrated view and make a comprehensive and holistic assessment to identify strengths in climate resilience of each system and their contribution in ensuring food and nutritional security of the country as a whole.

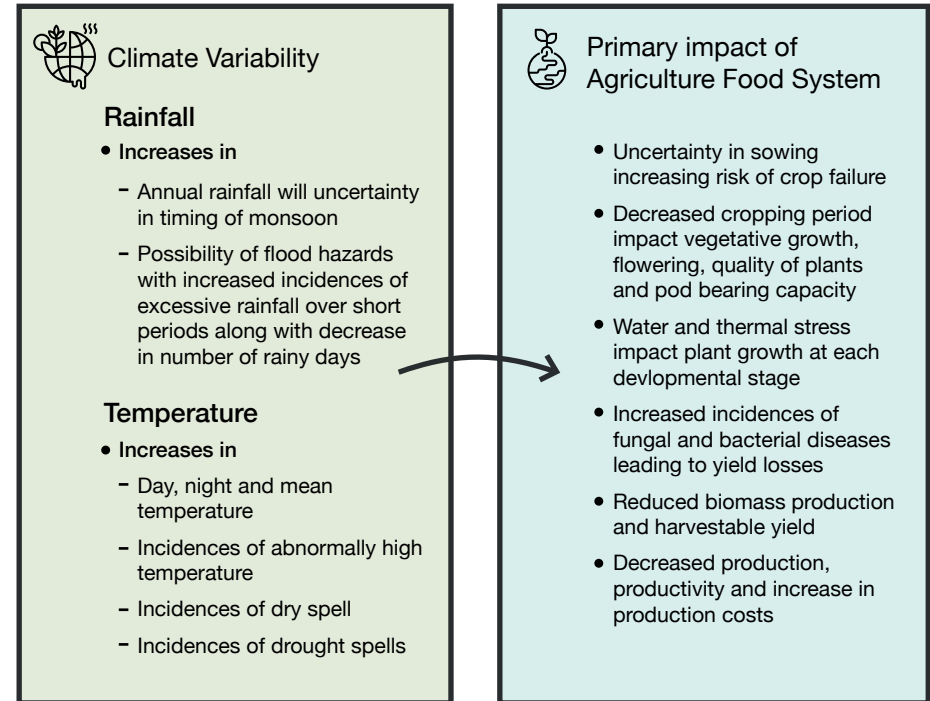
Issues

- The Coupled Model Intercomparison Project-5 estimates that for India, the average climate is likely to be warmer by 1.7 to 2.0°C for 2030 and the precipitation is likely to increase by 5-6%. Climate changes will have a direct and snowballing impact on production and the livelihood of people dependent on it.
- The composite climate change risk in the ICAR study of all 576 rural districts has found 109 districts with very high risk and 201 with increased risk due to climate change in reference to agriculture in the country.
- Post green revolution agriculture food system in the country has hovered around two major cereal crops: wheat and paddy. The research and technological development too have been led by these two crops. That has resulted in a decline in agro-biodiversity, both in plant species and varieties, contributing to increased vulnerability to climate risks at the farm level.

Risk due to Climate Change (2020-2049) in Agriculture



- Industrial methods that focus on production as the sole arbiter of performance have moved the food production system away from the farmer and farm to a pre-defined package of practices. The long-term impact on the increased (and often irrational) dosage of agro-chemicals on the farm has led to decreased fertility of lands, destruction of farm biodiversity, and increased risks in maintaining production and ensuring food and nutritional security.
- The issue of food insecurity and under-nutrition co-exist with the regime of increased production, which is sought to be addressed through distributive policies based on central procurements and subsidies for consumption. In a country where 85% of the farms are less than 2 ha in size, where 45% of the net area sown is operated by small and marginal farmers, and where 358 districts have more than 80% farmers as small and marginal farmers, the exposure to climatic stresses is high and widespread especially due to the movement towards a culture of mono-cropping and limitations of crop-specific packages of practices.
- Another factor that has impacted the sustainability of the present agri-based food system is its overreliance on groundwater for irrigation which is the most significant factor for yield stabilization.
- Agriculture is a biological production process and is directly impacted by climatic variations. These changes impact both the sustainability of the system and the livelihoods of people depending on it. The data suggest that rising temperature and declining rainfall will adversely affect agriculture productivity.



Vision 2030

- **Ensure that the nation continues to be self-reliant and ecologically sustainable by integrating diversity in all forms through collective, collaborative, and integrated actions by communities, Government, civil societies, consumers, and changemakers. The diversity is integrated by local climate-resilient food and nutritional security systems.**

Pathways

POLICY



Bring a paradigm shift in policies governing the agriculture production system from the yield-oriented production-centric perspective to the system-oriented perspective that accounts for the productivity of water, soil, and other components of the ecological system. It will allow accounting for the water and carbon footprints of different crops and will thus enable to focus on crops that are more nutritious, less water-guzzling, and do not have a negative impact on soil.

Create farm and farmer-centric policies to allow spaces for multiple realities and vulnerabilities faced by farmers. Recognise the promotion of crop diversity not only on the count of being remunerative but also as a major risk minimiser for the producers.

Formulate suitable policies to recognise women's role in agriculture as producers and change markers by encouraging their land ownership, decision-making, and access to schemes.

Adopt climate as a major policy plan to promote climate resilience in agri-food systems

- a. Consider multiple vulnerabilities faced by farmers and institute economic, fiscal, technical, and institutional measures that explore and develop climate adaptive practices in different geo-ecological conditions.
- b. Integrate the State Action Plans for Climate Change with agriculture and allied activities to make them relevant and effective at local and regional levels.

Pathways



Develop demonstrations of climate adaptive practices for different micro-ecosystems to improve soil health to reduce risks arising from climate variations. Integrate plans for sustainability in water availability as a measure to reduce crop failure on account of climatic variations.

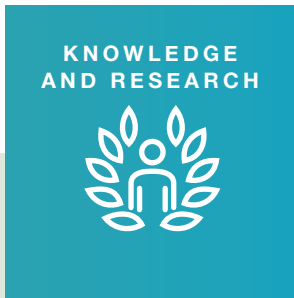
a. Utilise experiences in incremental adaptation from varietal breeding and management practices to strengthen such efforts and to deepen such experiences.

Promote agro-ecological practices that are based on recognition of ecological resource endowment at the farm level as adaptive practices in reference to region specific climate vulnerability.

- a. Invest on knowledge acquisition and transfer to extension systems.
- b. Promote technologies and farm implements that encourage and incentivize sustainable agriculture practices.

Develop climate resilient aquaculture practices as aquaculture is an important source of livelihoods and nutrition to communities.

Develop Voluntary Carbon Market (VCM) projects which are expected to grow by almost 15 folds in this decade due to increasing net zero or climate neutral targets taken by companies globally.



Democratise information and knowledge by bringing localized wisdom and harnessing the social capital and collective power of the community with a specific focus on women and producers as disseminators of experience and knowledge.

Apply farm-based and farm and farmer-centric research by integrating lab to land models of extension through the institutional mechanisms and practices of farmer schools to enable early adaptation through customized solutions.

Undertake local, crop, and variety-specific climate vulnerability studies in wider geographical areas to map vulnerabilities among different categories of farmers and to assess climate deficits amongst them.

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