

How Climate Change Is Affecting Crop Patterns in Rural Maharashtra

Climate change is no longer a limited concern; we have been witnessing its footprints all over the world. We often refer to it as a burden of developed countries, which the whole world is witnessing and suffering from right now. Maharashtra, mostly famous for its western ghats, Culture, Politicians and of course for the kind of crops here. Along with this Maharashtra has also been noticed as a state with the maximum number of farmers' suicides, and it's something which needs an extraordinary effort rather than climate conferences.

After the Kerala floods of 2018, we have clear statistics that the **instances of "extensive rainfall"** have been constantly increasing. The droughts, the unseasonal rainfall and the extreme weather patterns have affected the cropping patterns and lives of farmers adversely.

Over the last two decades, Maharashtra has seen a substantial shift in its climate. **According to the India Meteorological Department (IMD), the state's average temperature has risen by about 0.8°C since 1901, but monsoon unpredictability has increased. Between 2010 and 2020**, the Vidarbha and Marathwada areas saw seven catastrophic droughts, severely affecting rain-fed agriculture.

According to a **2023 NITI Aayog** research, Maharashtra is one of India's most climate-vulnerable states, with **more than 60% of its cropland** depending on monsoon rainfall. As climatic stress worsens, farmers are obliged to adapt, switching to more robust or profitable crops, even if they are environmentally unsustainable.

Millets such as jowar (sorghum) and bajra (pearl millet), which were formerly staples for dryland farmers, have been steadily declining. Jowar acreage in **Maharashtra fell by more than 45% between 2000 and 2020, as farmers shifted to commercial crops. However, the UN-designated International Year of Millets (2023)**, spearheaded by India, has inspired a renewed interest in their cultivation. Millets are drought resilient, use 70% less water than rice, and are high in nutrients. The Union Ministry of Agriculture initiated steps to incorporate millets into the Public Distribution System (PDS) and midday meals, as well as promote climate-resilient millet cultivars through ICAR institutes.

The **problem continues in developing stable marketplaces**. The government has declared an MSP for millets, procurement processes in Maharashtra are poor, restricting widespread adoption.

In sharp contrast, **sugarcane agriculture**, which requires a lot of water, has spread throughout the drought-prone state, notably in western Maharashtra. Despite accounting for only 4% of the state's cultivated area, **sugarcane uses more than 70% of its irrigation water (CACP, 2022)**. This has exacerbated regional water scarcity and left Marathwada and Vidarbha without crucial irrigation infrastructure. The basis for sugarcane's domination is its favourable MSP, guaranteed repurchase through cooperative mills, and strong political backing. While **initiatives such as micro-irrigation subsidies and water-use efficiency programs have been implemented**, enforcement remains inadequate.

Many farmers are now transitioning to horticulture crops like grapes, onions, and pomegranates, which are aided by drip irrigation, polyhouse farming, and mobile weather forecasting. **Maharashtra**

currently leads India in grape exports and onion production, accounting for more than 30% of the national supply.

These technology-driven crops generate greater returns and are climate-adaptive, but the transition is patchy. **Small and marginal farmers frequently lack access to capital, agri-tech, and market connections**, which limits their involvement in this shift. **In 2023 alone, Maharashtra had 2,947 farmer suicides (NCRB)**, the bulk of which occurred in Vidarbha and Marathwada. Crop failures, increasing indebtedness, and mental health problems continue to haunt rural families. Seasonal migration is increasing, particularly from Beed and Osmanabad.

Policy analysis: Successes and Gaps

- Soil Health Card initiatives and eNAM (National Agriculture Market) have helped some farmers increase their digital literacy and market access.
- The State Action Plan on Climate Change (SAPCC) highlights agriculture as a significant vulnerability sector and emphasises adaptation, although implementation is slow.

Gaps:

- Inadequate climate financing and a lack of tailored subsidies for dryland crops.
- A lopsided MSP and procurement structure that prioritises water-intensive crops like sugarcane and rice over millets and pulses.

Recommendations for Resilient Agriculture in Maharashtra

1. Reform Water Governance and Crop Incentives

Rationalise water allocation through **crop planning at the taluka level** and restrict sugarcane cultivation in drought-prone areas. Introduce incentives for **less water-intensive crops** through updated input subsidies.

2. Invest in Climate-Tech for Small Farmers

Scale up **low-cost drip irrigation, solar-powered pumps**, and **weather advisory services** in local languages. Expand access to these tools through FPOs and rural cooperatives.

3. Strengthen Climate Risk Insurance and Credit Access

Simplify crop insurance claim processes and link them with **real-time weather data**. Expand **credit guarantees** for dryland farmers investing in crop diversification and agro-ecological practices.

Maharashtra's agricultural transformation represents a larger tale about climate resilience, political economics, and scientific opportunity. To ensure its farmers' futures, the state must bridge the gap between climate-aware research and climate-proof policies, where technology, ecological wisdom, and economic fairness intersect.

