

# Rainfall Patterns, Cropping Systems, and Groundwater Dynamics in Maharashtra: A Comprehensive Analysis

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**Abstract:** Maharashtra is one of the largest agricultural states in India, with agriculture being the primary source of livelihood for a majority of the rural population. However, the state has been facing several challenges, such as water scarcity, depletion of groundwater resources, and climate change, which have a significant effect on the agricultural production and socio-economic conditions of farmers. The present study collected secondary data from various sources, which was analyzed using statistical tools and techniques to determine the correlation between rainfall and cropping patterns, the impact of cropping patterns on groundwater resources, and the socio-economic conditions of farmers in the selected districts. The findings of the study suggest that there is a direct correlation between rainfall and cropping patterns, and the impact of cropping patterns on groundwater resources and socio-economic conditions of farmers varies in the selected districts. The result highlights the need for sustainable agricultural practices that are suitable for the local agro-climatic conditions and can help improve the socio-economic conditions of the farmers.

**Keywords:** Agriculture, rainfall, groundwater, socio-economic, Maharashtra

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