

## Agricultural vulnerability to climate change in the dry region of Haryana, India Agricultural vulnerability to climate change in the dry region of Haryana, India

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The most important feature of the climate of the dry region of Haryana is the meagreness, concentration, variability and unreliability of rainfall. Among the major geographical factors which influence the agriculture of a region, climate seems to be the most important. The analysis of 60 years climatic data reveals the changing trend in the climatic patterns in the dry region of Haryana. Temperature is increasing and the average amount of precipitation has decreased significantly, causing water scarcity in the region for both crop and livestock. The cropping pattern is changing and region is approaching towards mono cropping. Wheat is the dominant rabi crop in the region followed by bajra in kharif season and both these crops are facing problems of crop yield reduction due to temperature rise. Soil moisture deficiency is observed in most parts of the region. The short rainy season is succeeded by long dry season, leads to lack of soil moisture and reduces the yielding capacity. Rainfall in the region is insufficient to recharge naturally the ground water resources or depleted soil moisture. Though the green revolution has made tremendous contribution to the food production in the region, but it also caused heavy loss to soil fertility due to excessive use of chemical fertilizers and pesticides. Integrated resource management practices are essential to protect the resources of the region for future sustainable agricultural growth. Emphasis should be given to create stronger incentives for climate friendly investments and support policies that address both climate and local environmental needs. For the formulation and implementation of sound environmental programmes and policies, it is essential to assess the vulnerability of the particular region based on composite indicators under GIS framework, which affect the agricultural practices in the region. On the basis of the composite analysis of the indicators used, the study area is categorized into three regions as of high vulnerable, medium vulnerable and low vulnerable. High vulnerable areas include the districts of Mahendergarh and Hisar. There is an urgent need to adopt the strategies which are capable of mitigating climate change, while promoting sustainable and equitable way of livelihood. Adaptation and mitigation policies in a region are complementary to each other to cope with the dearth of climate change. In dry regions water is the prime resource, so the practice of water harvesting needs to be encouraged, particularly in Bhiwani and Mahendergarh districts. Traditional water bodies as Johads has strong bondages, from the past with economy and culture of the traditional societies, now in the era of changing climatic conditions, these water bodies needs to be revived.

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