Climate change on food productivity in India

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Climate change refers to long-term changes in temperature and weather patterns. These changes can be caused by natural causes, such as changes in the solar cycle. Unfortunately, the main cause of climate change is human activity as the emission of CO2, and climate change affects all aspects of us, Climate change will not only cause floods or droughts. but affects people's health, food, security and jobs. Climate damage to the environment and places also wreaks incalculable damage to humans. Conditions such as rising sea levels and flooding have grown to the point where entire communities have been forced to relocate, while prolonged droughts are putting people at risk of starvation. This essay will discuss the case of Indian climate change on food productivity in the near future.

Climate change is one of the threats to Indian agricultural production. Apart from that, climate change is also having the impact on the economy by affecting human health, according to Hasegawa et al., (2016), The economic value of the loss of healthy lives due to lack of food from climate change is equivalent to -0.4% of global gross domestic product (GDP) and varies by region, ranging from -4.0% to 0.0% of regional GDP in 2100. Climate change is characterized by rising atmospheric temperatures, changing rainfall patterns, and increased rates of extreme events (IPCC 2013 cited in Rama Rao et al., 2022). Therefore, all of these factors have an impact on the sustainability and productivity of agriculture. The main source of protein for the Indian population is pulses, and the two staple food crops in India are rice and wheat. Except for wheat, chickpeas and rapeseed and mustard, all these crops are mainly grown in Kharif (rainy season) starting in June (Rama Rao et al., 2022). Furthermore, Rama Rao et al., 2022 analyzed that in 2100, Yields are likely to decline to a greater extent due to increased temperature, which is reflected in projected declines in rice yields of around 460 kg/ha (23.7%), maize (397 kg/ha, 21.1%), soybeans (337 kg/ha, 33.7%)), wheat (302 kg/ha, 11.4%), pearl millet (274 kg/ha, 30.5%). In summarize, in technology development, climate-related risks, especially the increased incidence of extreme events, need to be taken into account. At the same time, the utilization of rainfall trends should be rationally planned.

Much of India experiences two distinct planting seasons - Khalif and Rabi ([Sharma](https://onlinelibrary-wiley-com.ezproxy.lib.gla.ac.uk/action/doSearch?ContribAuthorRaw=Sharma,+Asha+N) et al., 2018). Khalif happens During the summer monsoon, thus warmer and more humid. As a result, India grows different plants for these two seasons. Rama Rao et al. (2022) indicated that during mid- and end-century periods in Khalif, the production of sorghum would decrease by more than 25% in 5 and 72 districts, may cause a production loss of more than 25000 tons. Simultaneously, Climate change in rabi would decline output of wheat in 141 districts in the country with three districts suffering more than 50% reduction during the mid-century (Rama Rao et al., 2020).

Furthermore, Extreme climate is also an important factor affecting food production, such as damaging heat and low rainfall. Above a certain temperature value is considered extreme climate. According to Sharma et al. (2018), the gross production of rice, sorghum, pigeon pea, wheat, safflower, soybean is effected by more than 20 percent in case of extreme climate. Moreover, the lack of precipitation has a greater impact than the high temperature, But in the future, the increase in temperature will be more obvious. Therefore, the increase in temperature cannot be ignored.

In summary, change of seasons, extreme weather all have impact on India's food production, In this case, different climate adaptation strategies should be specified on a case-by-case basis to deal with food shortages and even death.

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