


Chapter 3

A Review for Assessing the Impact of Climate Change on the Agricultural Sector, Food Security, and Pests in India

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ABSTRACT

This chapter observes the implications of climate change on production and yield of crops, and food security (FS) in India as per the previous studies. It also explains that climate change induced pests and insects in the agricultural sector. It also analyzes the role of adaptation and mitigation strategies in the agricultural sector and FS. The yield and production of crops are predicted to decline due to climate change and pests' germination. The use of technologies, mixed cropping pattern, cropping intensity, climate-resilient crops, drought-tolerance crop, irrigation facilities, soil management, water harvesting, bio-technology, green fertilizer, hybrid varieties of seed, soil conservation, crop rotation, appropriate technology, digital technology,

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ICT, and integrated pest management strategies will be effective for agricultural sustainability and FS in India. It also suggests the scope of further research in the above-mentioned fields.

INTRODUCTION

Sustainable food security (SFS) for all cannot be achieved without appropriate agricultural sustainability and resource efficiency in the farming sector (Rathore et al., 2021). Resource efficiency shows the sustainability of inputs in the agricultural sector. SFS does not have any negative or adverse impact on environmental resources. SFS is necessary for sustaining the social-economic prosperity of farming and non-farming communities (Kumar et al., 2017). It also mitigates the adverse impact of different factors of production on environment and ecosystem (Singh & Sharma, 2018; Rathore et al., 2021). Arable land is deteriorating due to extensive commercialization of the agricultural sector (Kumar & Gautam, 2014). Extreme variability in climatic factors is a serious threat for the whole world as climate change has a negative impact on farming, ecological services, trade, industrial production, health, energy, soil fertility and quality, and forest (Lizumi & Ramankutty, 2015; Singh & Singh, 2020). Climate change, therefore, created several problems for human development. Anthropogenic and natural activities are responsible for global climate change (Malhi et al., 2021). Urbanization, industrialization and infrastructural development have a large contribution to increase the severity in climatic and weather factors. The quantity of CO₂, CH₄, NH₄, NH₃, and CFCs increased unprecedentedly rate world-wide after the 1970s (Malhi et al., 2021). The overview of major sources of GHGs is described in Table 1.

Table 1. Overview of greenhouse gases and its main sources

S. No.	Name of Gas	Main Sources
1	Carbon Dioxide (CO ₂)	Industrialization, burning fossil fuel, wood fuel
2	Carbon Mono Oxide (CO)	Forest fire, grazing of cattle, wood fuel
3	Ozone (O ₃)	Chemical laboratories
4	Methane (CH ₄)	Dum of sea
5	Chloro Fluorocarbons (CFCs)	Electricity for lighting, cooling and heating
6	Nitrous Oxides (N ₂ O)	Use of fertilizers in agriculture
7	Nitrogen Oxide (NO ₂)	Agriculture and industry
8	Ethyl Mercaption (C ₂ H ₃ SH)	Home fuel

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