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**PAPER 4:  
ENSURING A SUSTAINABLE TROPICAL FRUIT INDUSTRY IN THE MIDST OF  
CLIMATE CHANGE THE INDIA STORY**

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**ABSTRACT**

India's horticulture sector is one of the main driving forces of the country with more than 30% share in the agriculture GDP. From 2016–2017, it was estimated that production was at 299.85 million tonnes from a planting area of 25.1 million hectares. This has outpaced the production of food grains since 2012–2013. Nevertheless, climate change remains a major threat to the horticulture sector. In the last 35 years (1981–2015), mean temperatures over the Indian subcontinent have indicated warming trends and this is projected to rise. India receives an approximate 75% dependable annual rainfall. However, climatic changes have caused the annual monsoon seasons to be erratic bringing in excess rain as well causing severe droughts in other regions — shifting production zones of tropical fruits. As a result of these fluctuations, fruit crops adapt phenologically, i.e., by altering their vegetative and reproductive stages. For example, in mangos, lower temperatures promote reproductive morphogenesis while high temperatures induce a higher percentage of hermaphrodite flowers. Decreased photosynthetic rates due to water deficiencies would result in stunted growths of papaya trees. These variations will adversely affect the quality and productivity of tropical fruits. Climate change also affects the activity of pests and pollinators. Due to rising temperatures, temperate regions in India have become more favorable to pests such as fruit flies and *Bactrocera dorsalis*; these pests have been discovered spreading to North India. At higher temperatures, it was observed that the active foraging time of pollinators have reduced by 26%–30%. To ensure sustainability of the agriculture industry in India, the National Initiative on Climate Resilient Agriculture (NICRA) was launched by the Indian Council of Agricultural Research (ICAR). Some of its objectives are to assess the impact of climate change and cultivate adaptive strategies to mitigate its effects across all sectors of agriculture. Proper management of resources as well as employing improved risk management strategies would enhance the resiliency of Indian agriculture amidst the looming threat of climate change.

**Keywords:** India, horticulture, climate change