Chapter 3
Sustainable Agriculture With Special Emphasis on Risk Management

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ABSTRACT

In India, agriculture is a source of employment to more than 50% of the population. Despite major strengths such as geographical location, diverse agro-climatic conditions, variety of soils, and agro-ecological congeniality, Indian farmers face diverse types of risks. Climate change is one the major risks confronting Indian farmers. Variations in climatic parameters such as rainfall, temperature, humidity, etc. result in a decrease in soil moisture and reduction in soil fertility. This has adversely affected crop productivity. History reflects that unpredictable climate change has affected the standard of living of Indian farmers. This gives rise to a strong need to study the risk management techniques of the Indian farmers. The chapter explores the diverse risks faced by Indian farmers and the risk management strategies adopted by them. The purpose of the research is to examine the different hazards that farmers encounter as well as risk management techniques. Primary data has been collected from 192 farmers in Maharashtra. Purposive sampling technique was used for collecting responses from the farmers. And an open-ended interview has also been conducted for another 30 farmers. The data was analysed using QDA miner software. The research shows how farmers deal with hazards using various ways and strategies. It can be advanced by looking into cutting-edge risk management strategies as well as potential enablers and obstacles associated with it.

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INTRODUCTION

Indian economy is heavily reliant on agriculture (Johnston and Mellor,1961). Indian farmer households rely solely on revenue from agriculture (73.33%), but 26.66% of farmers also make money from dairy, commerce, labour, and livestock. (Kaur, 2009). According to the Indian Economy report, share of agriculture in the national income has come down due to multiple reasons such as variation in climate, loss of soil fertility and reduction in crop yield (Dev, 2008; Dwivedy, 2011; Kumar and Nain, 2013; Mahendra, 2014; Joshi, 2015; Srinivasa et al., 2015; Vasu et al., 2016). India's agricultural output is influenced by climate factors like temperature, precipitation, and how much water the soil evaporates. Crop productivity in water-scarce regions has been impacted by the uneven distribution of rainfall and the lack of adequate irrigation infrastructure (Sinha et al., 1998; Kumar et al., 2004; Kumari et al., 2017; Mall et al., 2004; Mall et al., 2006). Another limiting factor that directly impacts crop productivity is the loss of soil moisture due to climatic changes. (Sarker and Biswas, 1978; Virmani et al., 1978; Biggs et al., 2008). Today, it is evident that there is a strong connection between agriculture, climate change, and water (Piao et al., 2010; Kumari et al., 2017). The three variables are linked and influence one another either directly or indirectly. A slight disturbance in one factor disturbs the whole cycle (Kumari and Patil, 2017). These factors raise the probability of agriculture risks in India. There are several risks faced by the farmers which need to be explored along with techniques that can manage these risk. These techniques not only lead to reduction in number of suicides but also minimise the risks in agriculture. A more sophisticated understanding of risk and risk management techniques has aided farmers in the risky situations and has helped policymakers assess the efficacy of various types of risk protection tools in the post-Farm Act environment, which has moved away from heavy government intervention. (Heifner et al., 1999). According to Velandia et al. (2009), the percentage of owned acres, off-farm income, education, age, and degree of business risk are the main factors influencing the adoption of risk management methods in agriculture. Information on such aspects can be used by educators, extension agents, and other information multipliers to improve risk management (Mishra and El-Osta, 2002). The majority of the risk encountered in the agriculture sector, according to Firas, 2011, is caused by drought. The rainfall fluctuations and drought conditions cannot be changed. However, farmers can undergo several adaptation strategies to sustain in agriculture. These strategies include diversification, crop rotation, creating other sources of income, adopting beneficial agriculture schemes, reducing intermediaries and creating proper storage. Farmers' response to risks pertaining to production, price or climate lead to better decision making. Farmers choose new crops or varieties depending on risk management factors such as water availability, cost-return analysis, resistance to drought and flooding, market demand, profit, and uncertain conditions. The decision making ability varies from small farmers to big farmers. Many farmers adapt multiple cropping system to mitigate the risk. There is a need of research for developing risk management strategies for farmers (Kumar et al., 2017).

Enterprise diversification, vertical integration, production and marketing contracts, insurance, and hedging in futures and options contracts are all ways to control risk. Kimura et al. (2010) investigated a range of risk management techniques, such as diversification, insurance strategy, government initiatives, and other useful technologies, in order to protect agriculture in the face of climate change. (Bhatta and Aggarwal, 2016; Sneha, 2017) . We feel that there is a need for further research in the area of risk management by farmers. Driven by the need, the research proceeds with an aim