

# Chapter 18

## Climate Change and Agriculture: Time for a Responsive and Responsible System of Water Management

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### ABSTRACT

*This chapter is an attempt to study the impact of climate change on water and agricultural production in India and abroad. While analyzing best practices in climate change adaptation and water management, the chapter examines regional issues and challenges. Policy interventions, success stories and new initiatives to tackle drought, boost rainfed agriculture as well as increase the irrigation potential have been studied together with the need for necessary course corrections. Leveraging technology for crop forecasting, inter-State river water disputes and measures needed to resolve them in the light of international experience are other areas of focus. In fine, the chapter calls for a comprehensive water policy that will not only recognize water as a national resource but also help bridge all differences for making world a worthy place to live in. The research methodology adopted in this chapter is primarily historical-analytical. Research papers, journal articles, official reports and newspaper clippings have all been consulted for analysis and interpretation.*

### INTRODUCTION

Day after day, day after day, we stuck, nor breathe nor motion; As idle as a painted ship Upon a painted ocean. Water, water, everywhere, and all the boards did shrink; Water, water, everywhere, not any drop to drink (Samuel Taylor Coleridge in the Rime of the Ancient Mariner)

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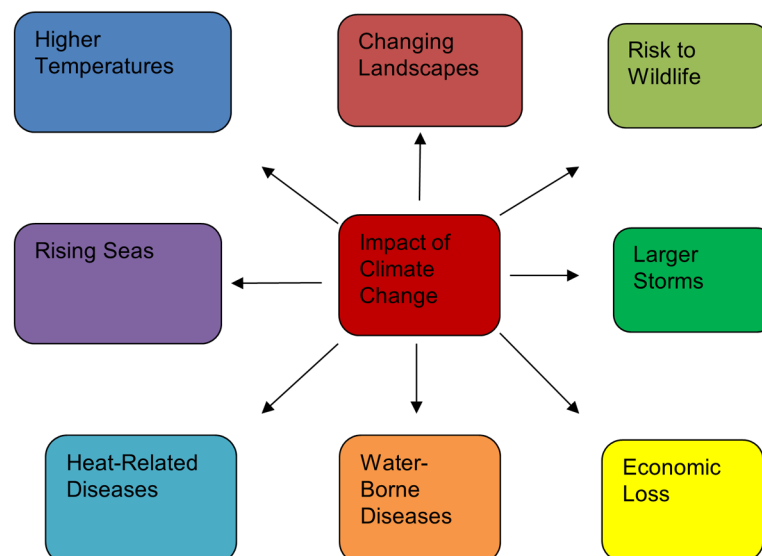
This poem, which signaled a significant shift to modern poetry and the beginning of British Romantic literature as far back as 1798, will no more remain a poem but become a stark reality if various studies in the recent past on the impact of climate change on water are to be believed. Indeed, these studies need to be considered as warning signals. In the Tenth Global Risk Report, the World Economic Forum has examined the acute water crisis in the world and maintained that the problem needs to be tackled with a sense of urgency (World Economic Forum, 2015).

India has been a victim of climate change impact on changing weather patterns in South Asia. Over the past five decades, rising temperatures have led to a 10% reduction in rainfall so crucial to Indian agriculture (Antholis, 2014). The melting of the Himalayan glaciers threatens India's water resources. The rising sea levels are a cause for concern for those living in low-lying areas in coastal cities of Kolkata (former Calcutta) and Chennai (former Madras) as demonstrated during the 2004 tsunami.

Water scarcity, tropical cyclones like Phailin in Odisha in 2013, Hudhud in Andhra Pradesh in October 2014 and Super Cyclone in Odisha in 1999, contamination of drinking water and groundwater, increasing number of deaths due to both heat wave and cold wave in North India and a rise in vector-borne diseases are major fallouts of climate change in India. Other related aspects of climate change can pose a major threat towards India's achievement of Millennium Development Goals and economic development. These are, water resources availability and river water disputes, change of monsoon pattern, reduced output of agricultural commodities such as rice, wheat and maize, distribution of water as per requirement and demand, extreme weather events such as floods and drought, the reduced green line in high altitude and latitude areas, and the reduced green line in low altitude and rain security areas. This, in turn, could trigger problems of governance, political discontent and internal security threats.

Climate change effects are visible in neighboring countries of India as well. Pakistan is one of the world's most water-stressed countries. It has emergency water reserves for only 30 days as against the recommended 1000-day supply for countries with similar climates. (Asian Development Bank, 2013). Owing to low snowmelt as a result of climate change, the Indus River, Pakistan's main source of fresh

Figure 1. Impact of climate change



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