

Effects of climate change on food security and food safety

Harshal Tukaram Pandve

Associate Professor, Dept. of Community Medicine, Smt. Kashibai Navale Medical College, Narhe, Pune-411041, India; Email: dr_harshalpandve@yahoo.co.in

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ABSTRACT

Global climate change is having its adverse effects on everything around us. Food security as food safety component is one which will be affected extensively over period of time due to climate change. This article reviews various effects as well as the pathways through which climate change will affect food security and food safety.

1. BACKGROUND

According to general consensus, the global climate is changing. Climate change has emerged as one of the most important environmental issues ever to confront humanity. Climate change impacts range from affecting agriculture - further endangering food security, sea-level rise and the accelerated erosion of coastal zones - increasing the intensity of natural disasters, species extinction and the spread of vector-borne diseases (Pandve HT, 2008).

The potential impact of climate change on food security is a widely debated and investigated issue. Nonetheless, the specific impact on safety of food and feed for consumers has remained a less studied topic (Miraglia et al 2009).

The Food and Agriculture Organization (FAO,2002) defines food security as a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Based on this definition, four food security dimensions can be identified: food availability, economic and physical access to food, food utilization and stability over time.

2. EFFECTS OF CLIMATE CHANGE

Climate change will affect all four dimensions of food security (FAO, 2008),

1. Food availability,
2. Food accessibility,
3. Food utilization
4. Food systems stability.

According to Tirado MC et al (2010) climate change and variability may have an impact on the occurrence of food safety hazards at various stages of the food chain, from primary production through to consumption. There are multiple pathways through which climate related factors may impact food safety including: changes in temperature and precipitation patterns, increased frequency and intensity of extreme weather events, ocean warming and acidification, and changes in contaminants' transport pathways among others. Climate change may also affect socio-economic aspects related to food systems such as agriculture, animal production, global trade, demographics and human behaviour which all influence food safety.

Lake IR et al (2010) had comprehensively reviewed climate change and its effects on food security. As per this review, reduction in the food production due to climate change may rise to increase in prices of the food. If rises in food prices occur, then individuals may shift to lower cost food items, which in turn, may have health consequences. Changes in food consumption because of increasing costs driven by climate change may also affect food safety as different foods carry varying risks of foodborne illness and different levels of pesticide and chemical residues. With climate change, food will be produced under different climatic conditions in altered ecosystems, which will alter agricultural conditions and be compounded by adaptations to such change. Conditions may be further altered through initiatives from the food industry to mitigate against climate change. Climate change may alter the seasonal patterns and abundance of pests and diseases, which may affect pesticide use. Climate change could affect existing pathogens or lead to the emergence of new pathogens in food, through effects on animal husbandry and animal-to-animal transmission, pathogen survival, and other mechanisms. An altered climate will mean that food will be produced under different environmental conditions and, coupled with adaptations to and mitigations against climate change, food production will be very different in the future. These changes will result in emerging pathogens, new crop and livestock species, altered use of pesticides and veterinary medicines and will likely affect the main transfer mechanisms through which contaminants move from the environment to food. All these may have implications for food safety and the nutritional content of food.

More frequent and more intense, extreme weather due to climate change will have adverse immediate impacts on food production, food distribution infrastructure, on livelihood assets and opportunities in both rural and urban areas (FAO, 2002).

As per Hellberg and Chu (2015), climate-induced trends will impact the persistence and dispersal of foodborne pathogens in myriad ways, especially for environmentally ubiquitous and/or zoonotic microorganisms. Animal hosts of foodborne pathogens are also expected to be impacted by climate change through the introduction of increased physiological stress and, in some cases, altered geographic ranges and seasonality.⁷

3. CONCLUSION

Climate change has far complex impact on food security and will affect all aspects of food security in a substantial way. Option against combating climate change are few, the only way in hand is mitigation and adaptation. For addressing food security for ever rising population, changing traditional ways of agriculture and farming at the same time keeping in mind that one should not contribute more towards further climate change is the need of the hour.

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