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Climate Change and Food Security for the Future

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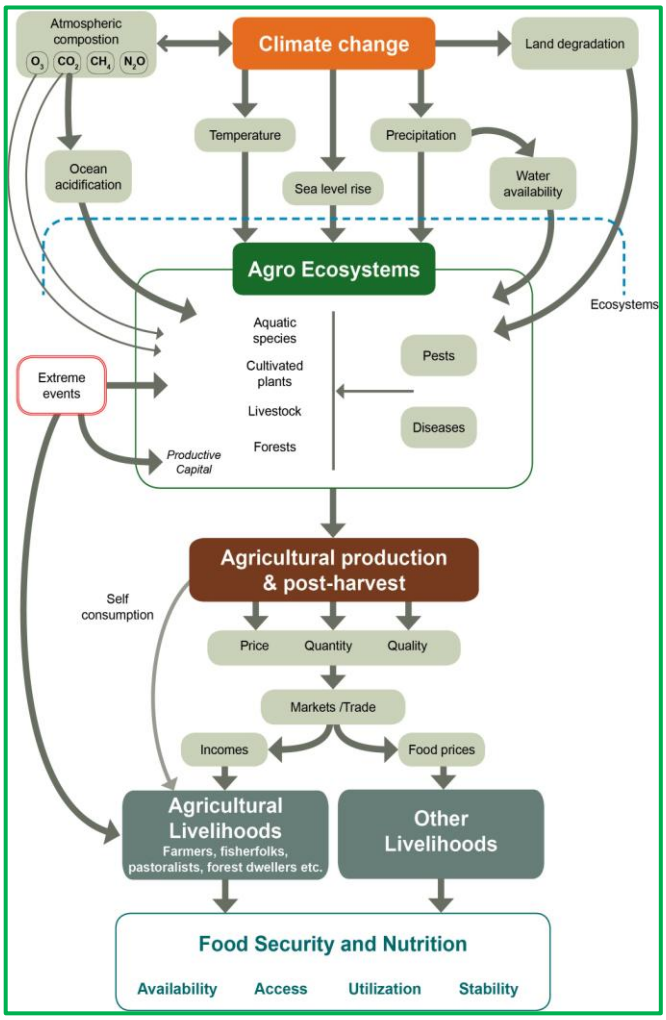
The severity of India's food-security concerns has been exacerbated by climate change. While the link between climate change and food security is complicated, most research concentrate on one aspect of food security, namely food availability. This research examines the effects of climate change on India's food security from three perspectives: availability, access, and absorption. It concludes that ensuring food security in the face of climate change will be a formidable challenge, and suggests a variety of solutions, including the adoption of sustainable agricultural practises, a greater focus on urban food security and public health, the provision of livelihood security, and long-term relief measures in the event of natural disasters.

Introduction

Agriculture is critical for food security in two ways: it produces the food that people consume, and it also provides the primary source of livelihood for the majority of the world's workforce. If climate change has a negative impact on agricultural productivity in Asia and Africa's low-income developing countries, the livelihoods of a huge number of the rural poor would be jeopardised, and their vulnerability to food insecurity will increase. Climate change affects agriculture, forestry, and fisheries. As a result, climate change is expected to have an impact on their manufacturing operations. In general, impacts are expected to be positive in temperate regions and negative in tropical ones, but there is still uncertainty about how projected changes will manifest at the local level, and potential impacts may be mitigated by risk management and adaptation strategies that improve preparedness and resilience. However, when severe weather becomes more often and intense, there is a greater danger of storm damage to transportation and distribution infrastructure, resulting in food supply chain interruption. The rising expense of energy, along with the desire to reduce fossil fuel use along the food chain, has resulted in a new calculation - "food miles," which should be kept as low as possible to reduce emissions. These variables may lead to increased local food security responsibility, which should be taken into account when developing adaptation measures for those who are already vulnerable or who may become vulnerable in the near future.

How does Climate Change Affect Food Security?

"Food security exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that fits their dietary needs and food preferences for an active and healthy life," according to the 1996 World Food Summit. Food security has three key characteristics, according to this definition: food availability, food access, and food absorption. As a result, adequate food production isn't enough to ensure a country's food security. One of the most pressing challenges related with climate change is food security. Food security is impacted by climate change in a variety of ways. Crops, cattle, forests, fisheries, and aquaculture are all affected, and it can have serious social and economic implications such as lower revenues, destroyed livelihoods, trade disruption, and negative health effects. However, the net impact of climate change is determined not only by the magnitude of the climatic shock, but also by the underlying vulnerabilities. According to the Food and Agriculture Organization, the net impact of climate change on food security is determined by both biophysical and social vulnerabilities.



Much of the literature on the impact of climate change on food security, however, has focused on just one dimension of food security, i.e., food production. The impact of climate change on the other dimensions of food security – access and utilisation – have received little scholarly attention. This article explores the impact of climate change on India's food security by considering all these dimensions of food security.

Food Production: Climate change adds to India's long-term food security challenges by affecting food production in a variety of ways. For one thing, it could lead to considerable increases in monsoon rainfall variability, both inter-annually and intra-seasonally. According to World Bank estimates, a global mean warming of 4°C will result in a 10% increase in annual mean monsoon intensity and a 15% increase in year-to-year variability in monsoon precipitation, based on the International Energy Agency's current policy scenario and other energy sector economic models. Droughts will become more common in the north-western section of India, according to the World Bank, while wetness will grow in southern India.

Food access: Climate change has the potential to stifle, if not completely eliminate, India's progress in terms of food security and nutrition. Changes in the duration of the agricultural growing season and the frequency of extreme events as a result of climate change, as well as the resulting increase in output, have a negative impact on the farmer's net income. India is especially vulnerable since its rural areas are home to tiny and marginal farmers who rely on rain-fed mono-cropping, which only offers a few months' worth of food security in a typical year. Food stockpiles begin to run out three or four months after harvest, farm work become

scarce, and food shortages reach critical levels by the next monsoon/sowing season. Fishermen and individuals who rely on the forest will also suffer as a result of climate change. Landless agricultural labourers who rely only on agricultural wages are at the greatest danger of becoming hungry. However, climate change's impact on food access is not limited to rural areas. Food insecurity in cities is also a serious problem, as poor families from rural and coastal areas frequently migrate to metropolitan areas in search of work.

Food absorption: Overall, climate change poses a global concern by reducing the production, nutritional quality, and consumption of some foods, such as fish, fruits and vegetables, and wild foods that are essential in the diets of poor rural and indigenous peoples. Climate change will result in the introduction of new pest and disease patterns, which will have an impact on human health and reduce the capacity to properly use food, bringing new challenges to food security. More people will be exposed to vector-borne diseases including malaria, dengue fever, and chikungunya, for example.

Way Forward: Recommendations

Adoption of sustainable agricultural practices: Better management of water resources must be a key feature of sustainable agriculture.

Stronger emphasis on public health: Despite the fact that the disease burden from vector-borne and diarrhoeal diseases is very high in urban slums and tribal areas of India.

Enhance livelihood security: India's National Rural Employment Guarantee Act (NREGA) of 2005 marked a global milestone in the history of poverty alleviation.

Greater emphasis on urban food insecurity: Because poor people make up the majority of India's population, it is not only a major contributor to global greenhouse gas emissions, but also a sufferer of climate change. Climate change, as previously said, will have a significant impact on urban food insecurity. As a result, urban food insecurity requires immediate intervention.

Long-term relief measures in the event of natural disasters: The majority of India's disaster-management measures are ineffective, short-lived, and poorly designed. Furthermore, much of the focus is on giving immediate help to afflicted households rather than establishing long-term adaptive measures. Natural disasters have a long-term impact on agricultural output and undernutrition, although little attention is paid to this.

Need for more impact assessment studies: An integrated assessment of the impact of climate change on India's food security is required to create climate-resilient agriculture techniques and crop varieties, as well as make appropriate policy responses. Climate change's impact on undernutrition and food absorption should be assessed and quantified as much as feasible through research.

Conclusions

Climate change is already having an influence on food security and nutrition, and it will continue to do so. Agronomically, favourable conditions for crops and other species will shift over the world. Changing crops and other farmed species, as well as moving them, will be required to optimise these conditions. Even reaping the benefits of anticipated favourable consequences, like as longer growing seasons in some frigid places, will almost always necessitate considerable modifications in agricultural systems and practises in order to successfully convert into increased productivity. Furthermore, these climatic changes would be accompanied by changes in other biotic factors (such as pests and illnesses), which may negate the benefits of climatic changes.