



CLIMATE CHANGE: FOOD SECURITY IN INDIA

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Abstract

Food security, and consequently nutrition security, will come under additional pressure due to the adverse impacts of climate change on global food production (including crops, livestock and fish products), thereby reducing food availability, stability of food supplies, and access to food. The overall impacts of climate change on food production include decreases in rainfall in the tropical region and reduced water availability in the temperate region. The impacts of climate change will be affect food prices and volatility, which have a strong impact on food security. The impact of high food prices will be more severe for the poor who rely on purchased food. Because of climate change, volatility in food production has emerged as the principal problem faced by small and marginal farmers. Due to decline in production and productivity, farmers are migrating to urban areas in search of alternative livelihoods. Nevertheless, a significant amount of migration is seasonal, implying that farmers do return home for cultivation during the monsoon season with this background of the study has touched upon several important aspects of climate change and its impact on food security in India.

Keywords: food security, food insecurity and climate change.

Introduction

Climate change is threatening the humanity by destabilizing agriculture and other means of livelihood around the globe. In our area the rapid meltdown of the Himalayan glaciers is not only raising sea-levels but also increasing flooding. This occurrence is affecting the poor communities disproportionately because of their heavy reliance on natural vegetation for farming and other means of subsistence. Because of climate change, volatility in food production has emerged as the principal problem faced by small and marginal farmers. Changing trends of Mother Nature have perilous impact upon food security. While earth's surface temperature has increased, precipitation has decreased significantly across much of the globe in recent years. As such, unprecedented droughts and heavy floods have become common phenomena these days. Such climatic crises not only affect crop productivity but also food prices and supply chain infrastructure, thereby affecting food security (Gregory et.al, 2005). Climatic crises further destabilize food security by deepening poverty among poor communities around the world. Climate change has now become one of the most important operative terms used in the world development discourse, and rightly so, given the gravity of this phenomenon in terms of its predicted adverse effects on human lives and property across the globe. The Human Development Report of 2008 describes climate change as the defining human development issue of our generation. It sees the phenomenon as a threat to the freedom of people, in terms of limiting their abilities to making choices which enable them to lead lives that they value (UNDP, 2008). At the Global level, the Intergovernmental Panel on Climate Change (IPCC) is mandated with the task of assessing the scientific, technical and socio-economic information relevant for understanding the risk of human-induced climate change. Evidences collected so far indicate considerable rise in average global temperature and consequences thereof are manifested universal through melting glaciers, more precipitation, increasing incidence of extreme weather events and shifting seasons. The biggest concern raised by climate change,

however, is its predicted impacts on agricultural systems across the world, and rightly so, because of the direct bearing of the same on global availability of food.

Climate Change

The 'climate change' has been a generally discussed phenomenon globally for more than past few decades now, there exist divergences in perceptions about the same in terms of its extent and effects. The essential challenge while trying to understand climate change is to distinguish between natural variations in climate cycles and gradual long-term variations that pose a threat to existence of life forms in the planet caused by human activities or controllable/endogenous factors. Attempts to define climate change are also limited by these complexities associated with the issue. In popular understanding, climate change is the consequence of rise in temperature in the earth's atmosphere, commonly known as global warming, resulting from breaching the permissibility of concentration of GHGs and the consequent trapping of radiations in the atmosphere. It is generally accepted, based partially on observations and partially on scientific evidences, that global warming leads to erratic weather patterns, melting of glaciers, etc., Climate change in IPCC usage refers to 'change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer' (Climate Change 2007: Synthesis Report). The IPCC refers to any change in climate over time, whether due to natural variability or as a result of human activity and further notes three independent/interlinked causes of climate change: a) natural internal processes, b) external forces and c) continuous anthropogenic changes in the composition of the atmosphere or in land use. This usage differs from that by the United Nations Framework Convention on Climate Change (UNFCCC), which defines climate change as 'a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods'. Climate change, like other environmental problems, involves an externality; the emission of greenhouse gases damages others at no cost to the agent responsible for the emissions (Stern, 2006). The earth's atmosphere does not differentiate greenhouse gases by country of origin. As a common asset, neither can property rights over it be distributed. It follows that no one country can win the battle against climate change acting alone (UNDP, 2008).

Food security

FAO has estimated that the total number of undernourished people in the world will decline by 9.6 percent to 925 million in 2010, after continuously increasing during the preceding five years (FAO, 2010). Though this is a positive sign and a welcome respite, this number remains unacceptably high at 16 percent of the world's population and far above the hunger reduction targets set at the World Food Summit in 1996, as well as by the MDG. The World Food Conference of 1974 defined food security solely in terms of food supply – assuring the availability and price stability of basic food at the international and national levels. The conference declared that food security is the 'availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices'. FAO, in 1983, introduced the concept of access to food, leading to a more refined definition based on the balance between the demand and supply-side of the food security equation. It stated the objective of food security initiatives as 'ensuring that all people at all times have both physical and economic access to the basic food that they need' (FAO, 1983).



Food production and availability

Climate affects food production directly through changes in agro-ecological conditions and indirectly by affecting growth and distribution of incomes and thus demand for agricultural produce. Changes in land suitability, potential yields (e.g., CO₂ fertilization) and production of current cultivars are likely. Shifts in land suitability are likely to lead to increases in suitable cropland in higher latitudes and declines of potential cropland in lower latitudes (Schmidhuber and Tubiello, 2007).

Stability of food supplies

Fluctuation in crop yields and local food supplies will adversely affect the stability of food supplies. Climatic fluctuations will be most pronounced in semi-arid and sub-humid regions and are likely to reduce crop yields and livestock numbers and productivity (Schmidhuber and Tubiello, 2007).

Access to food

Falling real prices for food and rising real incomes over the last 30 years have led to substantial improvements in access to food in many developing countries. Possible food price increases and declining rates of income growth resulting from climate change may reverse this trend (Schmidhuber and Tubiello, 2007).

Food utilization

Climate change will affect the ability of individuals to use food effectively by altering the conditions for food safety and changing the disease pressure from vector, water and food-borne diseases. Climate change may initiate a vicious circle where infectious diseases cause or compound hunger, which, in turn, makes the affected population more susceptible to those diseases (Schmidhuber and Tubiello, 2007). In addition, the nature of the problem of climate change in terms of its causes and effects implies that a broad range of ethical perspectives are likely to be involved, including issues of consequentialism, equity, fairness, justice, freedom, rights, sustainability and stewardship. Adding the fundamental right to safe and secure access to food to this list means that the new approach towards global policies and strategies must cover a very broad range of disciplines, including environmental management, growth and development, innovation and technological change, international developmental institutions, demography and migration, public finance, information and uncertainty as well as a host of other subjects connected with these (Bipul Chatterjee and Bipul Chatterjee, 2011). The adoption of strategies and policies for food security and the realization of right to food for every individual, an obligation of individual states, must be amongst such priorities. This would help build equitable long-term international agreements that address both climate change and food insecurity with clearly defined and jointly endorsed responsibilities of parties obliged by it, leading to much needed positive results.

Climate Change and GDP

The estimates of the economic cost of climate change have always attracted interest and debate among policymakers and the public. These estimates, however, have mostly been framed in terms of the impact on country-level or global GDP, which does not capture the full impact of climate change on people's well-being. Equally important is the fact that the impacts of climate change will be highly heterogeneous within countries. If the impacts mostly affect low-income

people, the welfare consequences will be much larger than if the burden is borne by those with a higher income. Poor people have fewer resources to fall back on and lower adaptive capacity. And – because their assets and income represent such a small share of national wealth – poor people's losses, even if dramatic, are largely invisible in aggregate economic statistics (World Bank, 2015). In example Climate change can affect the flow of people into poverty. In the Andhra Pradesh sample, drought is a major factor – a household affected by drought in the past was 15 times more likely to fall into poverty (Krishna 2006). Droughts may also result in people falling into poverty traps as a result of asset losses. They often affect human capital, especially for children who may be pulled out of school or suffer permanent health consequences (Carter et al. 2007).

Natural hazard impacts

The natural hazards such as floods, droughts, and extreme temperatures will increase in frequency or intensity as a result of climate change. The exposure, vulnerability, and lack of adaptive capacity of poor people puts them at particular risk. It is therefore no surprise that natural disasters have a well-documented impact on poverty (Karim and Noy 2014). The progress has been made in recent years, many poor people remain uninsured and they exhibit lower financial inclusion than non-poor people (FINDEX 2015). Climate change will worsen the frequency and intensity of natural disasters in some regions (IPCC 2014), but future impacts will depend not only on climate change, but also on the policies and actions implemented to manage risk. Land-use planning – especially in growing cities – is critical to ensure that new development is resilient and adapted to a changing climate (Hallegatte et al. 2013). Climate change will also change patterns of vector-, soil- and waterborne diseases, introducing them into new areas (Smith et al. 2014). We can only begin to measure the global burden of disease from climate change, but observed patterns are worrisome. A recent synthesis of five key aspects – undernutrition, malaria, diarrhoea, dengue and heat waves – estimates that under a base case socioeconomic scenario and a medium/high emissions scenario, approximately 250,000 additional deaths per year between 2030 and 2050 will be attributable to climate change (Hales et al. 2014).

Conclusion

Climate change due to decline in production and productivity, farmers are migrating to urban areas in search of alternative livelihoods. Nevertheless, a significant amount of migration is seasonal, implying that farmers do return home for cultivation during the monsoon season. In order to minimize the impact of climate change on rural livelihood, Indian governments need to focus primarily on pro-poor adaptation policies. Millions of poor people in the region live along coastal areas and floodplains of tributaries. Land reform policies should focus on bringing them out of vulnerable zones. Small and marginal farmers should be empowered through microfinance loans so that they can upscale adaptation methods. Mitigation strategies should be made coherent with adaptation methods.

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