

Adverse Impacts of Climate Change on Food Production, Security and Food Chains

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Abstract:

In spite of the considerable progress in reducing hunger during last several decades about a billion people in the world are chronically undernourished. Millions of children in the world under five years hindered attaining their proper growth because of malnutrition. Billions of people lack the essential micronutrients they need to lead healthy lives. According to FAO estimation to satisfy the growing demand driven by population growth and dietary changes, food production will have to increase by about 60 per cent till 2050. It isn't enough to have sufficient food produced globally to meet the demand, but that everybody always had access to it in the enough quantity and quality. According to the United Nations about a billion people in the world live in extreme poverty (less than 1.25 USD a day). At least 70 percent of very poor people live in rural areas and are depending partly or completely on agriculture for their livelihoods. It is estimated that about half of billion of smallholder farms in the developing world support almost two billion people. In Asia and sub-Saharan Africa these small farms produce about 80 percent of the consumed food.

Key words: food; security; production; famine; health; malnutrition; food chains

The main problems of Food Production and Security in the World

Food security is observed when all people, at all times, have free physical and economic access to sufficient, safe and nutritious food that satisfies their dietary needs and food preferences for active and healthy life. It depends mainly on four dimensions of food security: availability, accessibility, utilization and stability. It isn't enough to have sufficient food produced globally to meet the demand. Today enough food is produced globally but still there are about a billion hungry people in the world which hasn't access to it in the right quantity and quality all the time.

How climate change affects on food security

Climate change is already influences food safety during harvest transportations, storage and consumption. Such changes in climate as temperature, precipitations, and extreme weather conditions are main drivers of pathogens, food contamination and other food diseases [1-3]. For example:

1. Higher temperatures can increase the number of pathogens;
2. Precipitation has been identified as an adverse factor in contamination of irrigating water that is linked to food production;

3. Bacterial diseases induced during food storage can increase food spoil rates;

4. Such extreme events as storms and flood can introduce toxins in crops [4].

Pesticides adversely impact on plant biology and livestock pests:

Climate change adversely impact on plant biology and livestock pests (weeds, insects and microbes). Rising average temperature and CO₂ concentration in air can increase range of the pests' distribution their impact and vulnerability of host plants and wild animals. Increased use of pesticides can trigger contamination in fields that will influence on the whole food chains [5-7].

Nutrition

In developed countries food quality is essential to satisfy the basic nutritional needs. Chronic dietary deficiencies of micronutrients like vitamin A, iron, iodine and zinc contribute hunger in which the consequences of micronutrient insufficiency may not be visible or observed. It is leading health risk factors and adversely affects metabolism, immune system, cognitive development and maturation, especially in small children [8-9].

Climate change

Climate change, combined with social, economic and political conditions, may increase, vulnerability of such groups of population as: infants and small children, pregnant women, elderly people, low-income parts of population and people with weak immune systems who are more susceptible to the effects of climate change, on food safety and nutrition [10,11].

Exelerated Climate Change Will Increase Adverse Impact On Food Chains And Security

1.Climate change will increase hunger and malnutrition in some branches of economy and regions

Increased climate change will worsen the living conditions of farmers, fishers and forest-dependent groups of people who are already vulnerable and food insecure. Rural communities, particularly those living in fragile environments, will face immediate and growing risk of crop failure, loss of livestock and reduced access to marine, aquaculture and forest products. It will have adverse impacts on food availability, stability and food chains [12].

2. Fishing and aquaculture will be threatened by increased climate change

Climate Change will have increased adverse impact on all water surfaces in the world including oceans, seas, lakes and rivers and on all animals and plants that are found in them. Some fish species will become less abundant, while others will move to other areas [13]. Aquaculture can be threatened by extreme weather events like draughts and warming of the upper strata of the waters. Coastal communities may be displaced by rising water levels and forced to find new places to live and new ways to earn a living.

3. Agriculture contributes to climate change but it can be part of solution

Greenhouse gas emissions from forests and agriculture contribute about 31% of total emissions in the world (deforestation and forest degradation about 17.5% and agriculture about 13.5%). Agriculture however can at the same time contribute to reducing emissions by their impacts through managing ecosystems services, reducing of the land use change and related deforestation and forest degradation, better control of wildfires, organic soil management and agroforestry systems. All these measures can sequester significant amount of carbon [14]. Thus biological carbon can be managed by farmers, foresters and herds and they can improve local and global food security by adopting such management systems that combine mitigation and adaptation [15].

4. Sustainable livestock production

Grazing and cropland dedicated to the production of feed, represents approximately 70 percent of all agricultural land in the world. Overgrazing is the greatest cause of degradation of grasslands. Improved land management practices would help to achieve balance between competing demands for animal food products and environmental services. Improved pasture management and silvipastoral systems are effective ways to conserve the environment and mitigate climate change [16].

5. Sustainable forest management role in adaptation and mitigation of climate change

Approximately 13 million hectares of forests are lost annually in the world due to deforestation, forest degradation and overexploitation. By sustainable management of forests, reducing emissions from deforestation and forest degradation, as well as sustainably produced wood products that replace more carbon-intensive materials and fuels, are

important mitigation options [17-18]. Climate change is adversely affects the health of forests through increase of forest fires, pests and diseases. Adaptation measures not only reduce the vulnerability of forests, but can help to protect water and soil resources and biodiversity [19].

But without the political will of the governments of the biggest countries of the world, who are considered the main contaminants of the atmosphere, it will be impossible to reduce deforestation and forest degradation rates and achieve long-lasting adaptation and mitigation in the world.

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