

FORUM: SCIENCE & TECHNOLOGY

ISSUE: **The Consequences of Climate Change on Food Security**

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Introduction

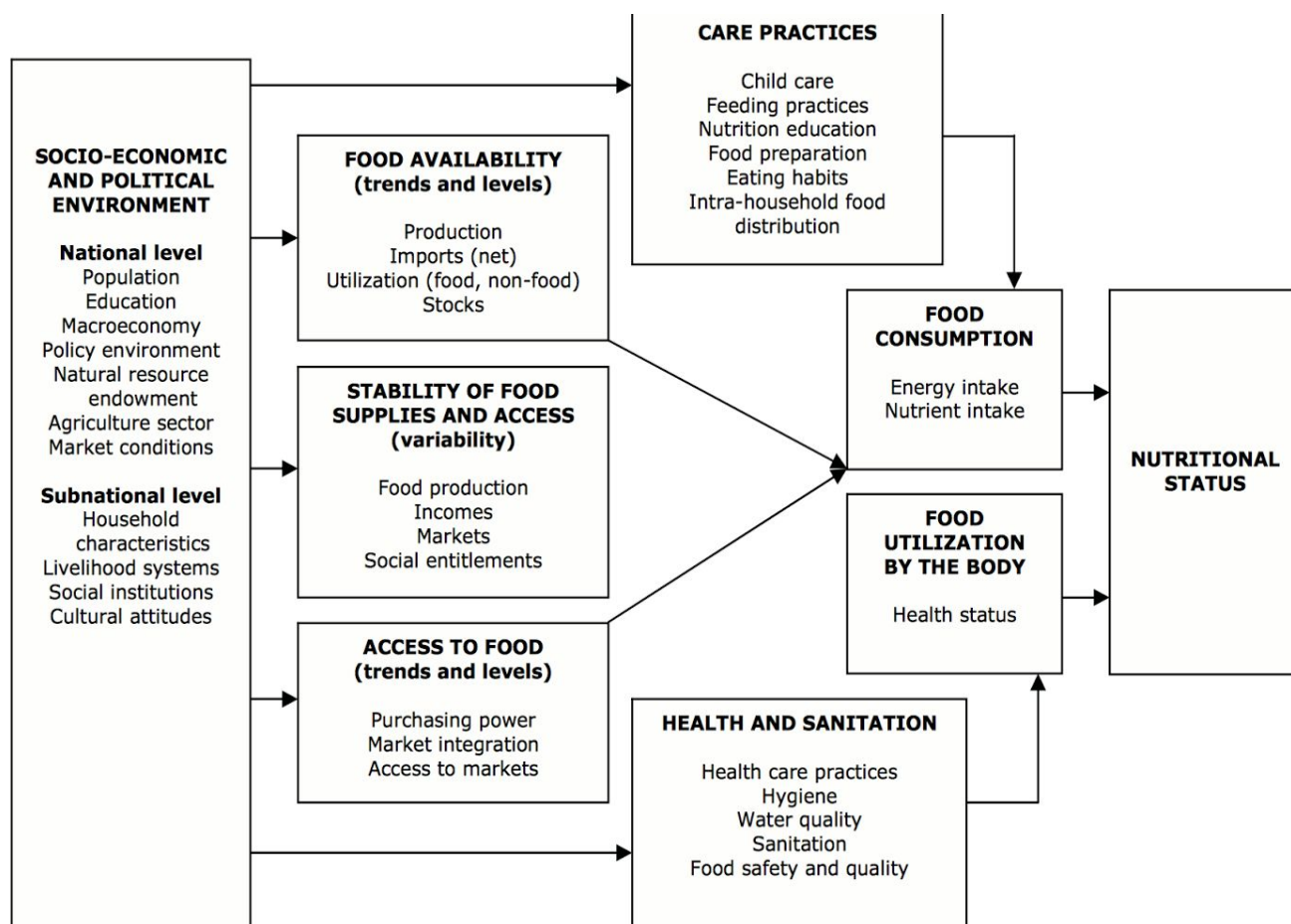
Living today, it is not much of a challenge to notice that the climate – be it in Canada, France or China – is rapidly evolving into something the we today have never seen. In the last century, our planet's average temperature has risen by 0.75 degrees. As innocent as that number may seem, its consequences are not to go unnoticed. "Each of the last three decades has been successively warmer than any preceding decade since 1850".(*un.org*) Natural catastrophes have never been so frequent, and the melting of Greenland and Antarctica's glaciers are provoking the rise of the sea level on earth. Droughts and floods are frequent consequences that various crop fields have to deal with, and when they are ignored, the consequences can be truly horrific. Food security relies on food production as much as the economy: the most vulnerable to these consequences are not only the poorest, but also the ones with the least means to adaptation. So how can humanity – whose world population keeps on rising – deal with the consequences of climate change on food security in order to maintain it, if not improve it with technology?

Key Terms

- The term of **food security** is a complex yet vital concept to fully understand as it subsumes a variety of aspects of alimentation and will be at the core of our debate. Food security is an ideal approach, existing "when all people at all times have physical or economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (*according to the Food and Agriculture Organization of the UN*). Similarly, The World Health Organization defines it by its "three pillars": food availability, food access and food use. It is quite important to note that food security relies more "on socio-economic conditions than on agro-climatic ones, and on access to food rather than the production or physical availability of food".

- The term of **food system** is used to define the entirety of all the factors needed in order to make up food security. It includes the production, the processing, the distribution, the consumption and the waste of aliments. You will find below a framework explaining all the necessary factors to reach the ideal state of food security.





•By the 'simple' term of **Climate Change** is meant "a long-term change in the earth's climate, especially a change due to an increase in the average atmospheric temperature", although there is no official definition internationally agreed on. Climate change is measured by the World Meteorological Organization, which "requires the calculation of averages for consecutive periods of 30 years, with the latest being from 1961 to 1990." These measures are spread over a long-enough period to eliminate small variations (from year to year). Of course, today climate change is overly due to carbon dioxide, methane, nitrous oxide and halocarbons gas emissions : all due to our human activities.

Background information and overview

As seen above, food security is a concept only achieved when all three of its pillars exist: food availability, food access and food use. It is therefore a quite vulnerable system as it can and will never be guaranteed. If achieved, it can disappear within years if the food system in question is not sustainable. In the late 1990s, the impacts of droughts in Africa were horrifying: the livestock losses ranged between 20 to 90 percent of national livestock. Indeed, livestock, plants and fisheries are directly dependent on the climate surrounding them. While a moderate warming could potentially help crops grow more rapidly, too much



heat could be catastrophic for livestock and fisheries. For example, it was reported in several American states that more than 5000 animals were lost from just one heat wave.

Major countries and organizations involved

- Food security has been a goal for decades now to many worldwide associations such as **the Food and Agriculture Organization** or **the World Health Organization**; their aims are progressively being met. The latest statistic concerning food insecurity from the FAO states, “prevalence of undernourishment has fallen from 18.7 to 11.3 percent globally” in the last decade.
- In addition, the organizations involved with the identification of potential future climate threats, or the options of adaptations – like **the Intergovernmental Panel on Climate Change** – do play an important role in this issue. This body was created by the collaboration of the **World Meteorological Organization** and the **United Nations Environment Program**.
- **All countries** are involved in this issue as climate change has consequences upon the entire globe and not only regions, although some are endangered more than others. For examples, LEDCs will suffer from the consequences first, as their populations are increasing more rapidly than MEDCs and their population is often dedicated to agriculture and unable to adapt its methods as rapidly as in MEDCs. Countries that are close to the sea are also said to be one of the first victims of climate change. This said, all countries have had experience with climate change and MEDCs are involved in the research of a possible long-term solution.

Timeline of events

- **March 1974:** Bangladesh Famine officially killed 27 000 people, although the unofficial number is much higher (1.5 million, including the post-famine death due to diseases). The famine was partially caused by a massive flooding along the Brahmaputra River: although it would be virtually impossible to prove this to be a consequence of climate change only, we do know it has to be at least partially caused by climate change as the nation was not used to such important floods. This is considered to be the worst famine in the last decades and is proof of how much damage a climate-related catastrophe/change can have on an unprepared country, especially an LEDC.
- **December 1974:** **The first World Food Conference** was held in Italy, Rome, thanks to the FAO after the Bangladesh Famine.
- **1960s-1980s:** **Sahel Drought period** caused a great famine that killed 100 000 people, and left 750 000 others completely dependent on food aid. The drought had severe impacts on the economy, livestock, and agriculture of Niger, Mali, and many other African countries. (These droughts, after scientific research, are found to have been occurring in the past three thousand years in that particular zone, but had never had such horrific consequences.)
- **1996: World Food Summit** : This conference discussed the state of world food security and made a plan of action, which could for the most part still be applied today. In their



declaration, they state that “[They] will pursue participatory and sustainable food, agriculture, fisheries, forestry and rural development policies and practices in high and low potential areas, which are essential to adequate and reliable food supplies at the household, national, regional and global levels, and combat pests, drought and desertification, considering the multifunctional character of agriculture”

(<http://www.fao.org/docrep/003/w3613e/w3613e00.HTM>)

• **September 2000: The Millennium Development goals** by 2015 : The seventh goal is to ensure environmental sustainability. How is it related to climate change and food security? In fact, this goal takes into account the consequences of climate change on food production. As we know, food production is part of the food system and is therefore linked to food security. More about this goal?

“The natural resources base and ecosystems must be managed sustainably to meet people’s food requirements and other environmental, social and economic needs. Climate change, increased water scarcity and conflicts over access to resources all pose challenges to environmental sustainability and food security.”

(<http://www.fao.org/post-2015-mdg/mdg/goal-7/en/>)

• **2007/08: World Food Price Crisis**, “The World Bank estimates that the spike in global food prices in 2008, followed by the global economic recession in 2009 and 2010 has pushed between 100-150 million people into poverty.”

• **Winter 2015: COP 21** as climate change is at the core of the conference and food insecurity is a worldwide worry : “Climate change has a direct impact on the food security and livelihoods of poor family farmers, pastoralists and agro-pastoralists.”

• **International Scientific Conference on Climate Change 2016**: This conference - though unheard of for the most part, and not likely to help you considering it will happen post-debate - could be a key event. Their conference will involve: *“High-level discussion highlights pathways for achieving food security under climate change and reducing global emissions from agriculture.”*

Relevant UN treaties and events

- The **United Nation’s Framework Convention on Climate Change** (*New York City, 4th of June 1992*). Aims to “stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous interference with the climate system”.
- The **Convention quantified economy-wide emission targets for 2020** (*2009/2010*): concerns developed countries, aims to reduce emissions, which lead to NAMAs (Nationally Appropriate Mitigation Actions).



- The **Food Assistance Convention** (*London, April 25th of 2012*): Aims to “reduce hunger, save lives, improve food security and improve the nutritional status of the most vulnerable populations.”
- The **International Treaty on plant genetic resources for food and agriculture** is making it its goal to : “recognize the enormous contribution of farmers to the diversity of crops that feed the world; [and] establish a global system to provide farmers, plant breeders and scientists with access to plant genetic materials”. Although this treaty does not directly mention climate change, access to genetic material to produce the right type of crops at the right moment could be key to the survival of small farmers vulnerable to droughts and floods.
- The **European Commission’s conference on climate change and food security** focused on “the impact of climate change on food safety and food security, the conference [debated] on the emerging risks to high quality and health of plants and seeds which are also crucial to ensure sustainable and productive agriculture.”

Previous attempts to solve problem

As mentioned before, the **United Nations Framework Convention on Climate Change (UNFCCC)** was created on the first UN conference on Environment and Development. By creating it, they were hoping to considerably reduce and stabilize gas emissions in order to avoid threats on human life, and to ‘ensure that food production is not threatened’ (article 2 of the UNFCCC). In the past years, many LDCs have started to include projects concerning their agriculture and food security in their National Adaptation Programs of Action : plans that exist to help these nations “identify priority activities that respond to their **urgent** and **immediate** needs to adapt to climate change – those for which further delay would increase vulnerability and/or costs at a later stage.” (*see unfccc.int*)

A couple examples to show that adaptation is possible:

- “Studies in Nicaragua have demonstrated that farmers adopting a spectrum of agro-ecological practices such as crop rotation, green manure, the use of natural fertilizers, cover ditches, crop diversification and reduction in burning frequency lost 18 percent less arable land, preserved 40 percent more topsoil and enhanced soil quality compared to controls after a major hurricane (Holt-Giménez, 2002).”
- “Some regions have experienced major increases in soil salinization due to excessive water extraction for agriculture. This trend is likely to be exacerbated by changes in the pattern of precipitation that will occur with climate change. Also soils can become salinized as sea level rise increases the frequency of salt water incursions. Australian scientists have recently developed a variety of durum wheat that has 25 percent higher yield on saline soils (Munnset al., 2012). The gene responsible was discovered in a wild relative of wheat and incorporated into the crop using non-GM techniques.”

(*see “Food Security and Climate Change”, a report by “The High Level Panel of Experts on*



Food Security and Nutrition” for more detail)

Possible solution

So how can the UN respond to such threats made to the world’s impending food security? Over time, living creatures have had to adapt, and this is the key to our possible solution. Adaption nowadays will not only directly affect the food system, but will also require adaptations in the economic and social aspect of food security. Food producers all over the world need to be better supported in order to pressure them into adapting their harvest methods and crops. Yet, the only way farmers could potentially adapt their work to climate changes would be for regular assessments of the world’s state to be made more regularly and thoroughly. Along with this stands modernization. Today, our lives are dominated by technology and science, which are incredibly important resources in terms of development and food security.

List of suggestions of things to consider for the issue:

- “Increase immediately investments for food security and resilience to climate change
- Refocus research for adaptation and mitigation to address a more complex set of objectives, and invest in public research for adaptation
- Modernize extension services
- Build capacities
- Base adaptation measures on assessment of risks and vulnerabilities
- Facilitate exchange of practices
- Facilitate greater diversity in the field and give broader access to genetic resources
- Promote an international trading regime that incorporates the concept of food security and contributes to the resilience of food systems”

(see “Food Security and Climate Change”, a report by “The High Level Panel of Experts on Food Security and Nutrition” for more detail)

Reliable sources / Bibliography

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- <http://www.who.int/trade/glossary/story028/en/>
- <http://www.who.int/mediacentre/factsheets/fs266/en/>



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Forum For Agricultural Risk Management in Development:

- <https://www.agriskmanagementforum.org/content/farmd-annual-conference-2014>

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- http://www.fao.org/fileadmin/user_upload/hlpe/hlpe_documents/HLPE_Reports/HLPE-Report-3-Food_security_and_climate_change-June_2012.pdf

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- http://ec.europa.eu/dgs/health_food-safety/information_sources/events/20150714_climate-change_expo_milan_en.htm

