Food Security in a Changing Climate: A Plea for Ambitious Action and Inclusive Development

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Abstract Climate change is a threat multiplier, particularly when it comes to food security and nutrition. Its impacts on agriculture, nutrition and health will be particularly felt by the most vulnerable segments of the world population and whom appear to contribute the less to the root causes of climate change. Fighting this injustice requires ambitious climate action, based on transparency and the participation of empowered social movements both at national and international levels.

Keywords Nutrition · Adaptation · Transparency · Participation · Hunger

According to the UN Food and Agriculture Organization (FAO) 795 million people suffered from food insecurity in 2016 (FAO 2017: vii). This means that one out of nine people in the world are food insecure when the global agricultural output could meet the energy requirements of twelve billion people (Ziegler 2008). This statistic reveals a major malfunctioning of our food system – we can produce more food at a lower cost but major segments of the world population are still excluded. Indeed, food security is not only about food production – it has much to do with poverty and inequalities.

Climate change is a crisis aggravator and threat multiplier for the most vulnerable amongst us. Its impact on food production, livelihoods and health is expected to push an additional 600 million people into food insecurity by 2080 and increase child malnutrition (IPCC 2007: 813).

Smallholder farmers, women and children, and the poorest in developing countries will be on the front-line, suffering most of the impacts of climate change while contributing the least to its causes. They must therefore receive particular attention in the design and targeting of climate change adaptation projects. Additionally, climate change commitments, policies and action should be driven by their priorities, putting food security and good nutrition at the core of the United Nations Framework Convention on Climate Change (UNFCCC) agenda and strengthening the voice of the most vulnerable in its processes and meetings.

In 2012, the Committee for Food Security recognized the need for action on climate change and food security issues, when it adopted a decision box and published a report by the dedicated High Level Panel of Experts. Nonetheless, this recognition did not bring substantial changes and food security was only integrated in the Paris Agreement in 2015 thanks to effective advocacy from civil society organizations.

Climate Change: A Threat Multiplier for Food Security and Nutrition

Climate change is a major threat to food security and nutrition. Estimates of its impact show that severe stunting in children could increase by 23 percent in central sub-Saharan Africa and 62 percent in South Asia by 2050 compared to a future without climate change (Lloyd et al. 2011). Indeed climate change impacts every pillar of food security (availability, access, quality and stability) along with the components of nutrition security.

Availability of sufficient food at family and market level is compromised by reduced productivity and increased risks of crop failure or destruction due to extreme weather

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events, pests and diseases. Even if the impacts of climate change on productivity will be felt differently around the world until 2030 (FAO 2016: 19), the total loss of agricultural output in sub-Saharan Africa could reach 11 per cent in 2080 (UNEP 2013), if nothing is done to adapt agriculture systems.

Physical and financial ‘access’ to food will also be impacted. According to the World Bank (2016: 15), up to 122 million people could fall into poverty by 2050 as a result of climate change. Yet, poor people are the most vulnerable to changes in food prices and the combination of livelihood depletion and poverty with reduced availability of food items and price increase could become highly problematic for the poorest.

Third, the nutritious quality of crops and their safety will also be affected by climate change. According to Springmann et al. (2016), the reduced availability of fruits and vegetables will contribute to an additional 534,000 deaths per year in 2050, due to subsequent deficiencies in vitamins. Lloyd et al. (2011) also shows the increase in carbon dioxide air concentration will reduce the iron, zinc and protein content in grains. In addition, warmer or wetter conditions in certain areas will increase the concentration of aflatoxins in stored staple foods, which represents an additional health risk.

Finally, the stability of these three pillars is further compromised due to higher inter-annual and inter-seasonal variability of rainfalls and temperatures, erratic occurrence of disasters, out of the usual timeframe and geographical area and the greater occurrence of global weather phenomena such as the El Niño Southern Oscillation (ENSO).

Focusing on food security does not fully represent the complex impact of climate change on nutrition, especially when looking at children aged under five. Thus, a broader focus on nutrition security is necessary. Nutrition security is the situation ‘where food security is achieved together with a clean sanitary environment, health security and good care and feeding practices’ (WHO 2013). As such, it is also necessary to include water, physical and mental health perspectives when considering responses to nutritional security. All these domains will also be impacted by climate change in many different ways.

Water, hygiene and sanitation are at the centre of many challenges. The availability of water is expected to change in many regions, either positively or negatively. Safe drinking water is threatened, as higher temperature increases the concentration of bacterial charge, such as coliforms, the main cause of diarrhoeal diseases. Reduced access to water compromises hygiene practices which subsequently increase the risks of water-borne diseases. Moreover, natural disasters increase the risks of faecal contamination of drinking water, which could lead to cholera outbreaks.

The changes in local climatic conditions will also modify the geographic repartition of some diseases and disease vectors such as mosquitoes. In 2080, two billion people will live in areas prone to malaria and dengue (Hales et al. 2002). At the same time, physical and financial access to health services and infrastructure might be affected by natural disasters and livelihood depletion of the most vulnerable. Furthermore, increasing temperatures, more frequent heatwaves, loss of livelihoods or housing will increase mental stress and impact peoples’ capacity to respond to their daily needs. Finally, with increased risks of forced displacement due to disasters, submersion, cross-community violence or open conflicts, the ability of people to ensure good care and feeding practices will be considerably affected.

All of the above shows how climate change completely challenges the realization of human rights. It raises in particular climate justice issues linked to food security and the right to adequate food.

Climate Change Impacts: The Poorest on the Front-Line

In February 2015, during a preparatory work session on the UNFCCC Paris Agreement, 18 countries adopted the Geneva Pledge for Human Rights in Climate Action.¹ The text explains that ‘the effects of climate change will be felt most acutely by those segments of the population who are already in vulnerable situations owing to factors such as geography, poverty, gender, age, indigenous or minority status and disability’. The document further stresses: ‘We cannot overlook the injustice faced by the poorest and most vulnerable people who are disproportionately affected by the impacts of climate change. In a transition to a low carbon economy we want to ensure that no one is left behind. We will promote and respect human rights in our climate actions. We stand in solidarity with our people and future generations to take urgent action on climate change.’

Indeed, some segments of the population are impacted much more by climate change: women and children, the poorest living in disaster prone areas and the small scale food producers. This adds a degree of injustice to the already striking fact that countries most affected by climate change (least developed countries (LDC), small island developing states (SIDS)) are those who historically contributed the least to greenhouse gas emissions.

Women and children are particularly at risk during natural disasters. Peterson (2007) showed that they are 14

¹ These countries are Costa Rica, Chile, Guatemala, France, Ireland, Marshall Islands, Kiribati, Maldives, Micronesia, Mexico, Palau, Panama, Peru, Philippines, Samoa, Sweden, Uganda and Uruguay. The text is available: <http://carbonmarketwatch.org/wp-content/uploads/2015/02/The-Geneva-Pledge-13FEB2015.pdf>.

times more likely than men to die during such an event. This was confirmed by the World Bank (2016: 141), explaining that poor people are more exposed and vulnerable to the impacts of climate change, making it a ‘magnifier’ of existing inequalities.

Smallholder farmers are in a paradoxical situation: they represent the foundation of world food security as they produce 80 percent of the food consumed in sub-Saharan Africa and Asia (IFAD 2013: 10) and yet their activity is particularly at risk because of climate change. Moreover, FAO (2017: 70) provides a reminder that most of the people suffering from food insecurity already are those in rural areas who depend on small scale agriculture. In 2010, three quarters of the 1.2 billion extremely poor people lived in rural areas and 750 million of those worked in agriculture. The high vulnerability of the rural poor arises from their exposure to extreme weather events combined with the sensitivity of agriculture, livestock and fishing to local changes in climate conditions and natural disasters, and their low incomes and savings, inducing a low adaptive capacity.

We must note that those segments of the population already chronically enduring food insecurity situations will be even more vulnerable. Bloem et al. (2010) build on the existing evidence of the impacts of food and nutrition insecurity on acute and chronic crises among population groups such as children and women. They explain that facing increasing food prices, the poorest have to prioritize cheap and calorie-rich but nutritionally poor foods; this results in micronutrient malnutrition. Bloem et al. further specify that the subsequent deficiencies ‘exacerbate pre-existing vulnerabilities among those affected by the impacts of climate-related hazards’ and ‘fuel the long-term fallout of lost generations of children born into this debilitating cycle, whose effects follow them into adulthood in the form of poorer health, lower incomes, and reduced physical and intellectual capabilities.’ There is a clear vicious cycle between nutrition insecurity, poverty and climate change adaptation capacity.

This distressing evidence of inequality facing the heavy burden of climate change is unfortunately deepened by a profound injustice – we are reminded yet again that those who contribute least to greenhouse gas emissions are affected the most by its consequences.

Climate Justice and the Food System

The globalized food system offers a good picture of climate justice issues. Those who have ‘high emissions’ diets are less vulnerable to climate change and vice versa. Indeed, wealthy populations of developed countries as well as the increasing middle and high income population segments in

developing countries can enjoy meat and animal-product rich diets, responsible for high levels of greenhouse gas (GHG) emissions. Their income situation also gives them a higher adaptive capacity and a lower sensitivity to climate change. At the opposite end, the poorest and most vulnerable, particularly in developing countries, often rely on a plant-based diet, which induces very little GHG emissions. Indeed, according to Scarborough et al. (2014), vegan, vegetarian, fish-based and low to high meat-based diets in the United Kingdom respectively represent 2.9, 3.8, 3.9 and between 4.7 and 7.2 kilogrammes of carbon dioxide equivalent emissions per day. That said, the exact contribution of food systems to climate change is not certain – the low-end hypothesis ranks food systems emissions as ranging from 19 to 29 percent of global greenhouse gas emissions (Vermeulen et al. 2012), while high-end hypothesis allocates them 44 to 57 percent of this total (GRAIN 2011). Agriculture is responsible for 56 percent of nitrous oxide and methane emissions (Wollemberg et al. 2016), two GHG respectively 25 and 298 times more impactful than carbon dioxide.

Agricultural systems throughout the world have very differentiated contributions to climate change. Those based on mechanization and the use of chemical fertilizers have a high level of emissions, especially carbon dioxide and nitrous oxide. Similarly, animal rearing emissions – mostly methane – increase as it ‘becomes more disconnected from landscapes and from local feed sources’ (IPES Food 2016). Meanwhile, agriculture and livestock systems based on natural ecosystems services, best use of soil fertility and the integration of animal rearing and crops have a reduced impact on the environment and the climate. Low input smallholder farming contributes much less to climate change than industrialized and chemical based farming in developed countries (the European Union, the United States of America and Australia make up for 17 percent of total agriculture emissions) and the emerging countries (India, China, Brazil, Argentina and Indonesia represent 40 percent of the agriculture sector emissions altogether).²

These facts seem to lead to a contradictory conflict between the realization of several human rights: the right to adequate food, the right to good health, the right to development and the right to a clean environment. As a matter of fact, the globalized food system is failing at feeding the whole population, as about 795 million people are still chronically suffering from hunger; it also nurtures malnutrition by fostering the access to cheap but calorie-rich and nutrient-poor food items; depletes natural resources and increases climate change vulnerabilities. A clear paradigm change in our food systems is therefore needed to

² Calculated using data from the World Resources Institute in March 2017 on <http://cait.wri.org/historical/>.

achieve all the above mentioned rights altogether: new food systems based on environmental integrity, social acceptability, good productivity (by unit of resources) must be designed. Agroecology, a model of agriculture based on the best use of biodiversity and ecosystem services, offers a new model for agriculture and food systems that could produce food in sufficient quantity and quality for all, while ensuring sustainable livelihoods for farmers and good health while respecting the environment.

However, such a change would require strong political will and commitments. This would also mean that the priorities of the most vulnerable to food insecurity and malnutrition are put at the core of agriculture, food and climate change policies.

Putting Food Security and Nutrition at the Heart of Climate Action and Governance

According to Tronquet and Foucherot (2015), agriculture is a neglected area in the international negotiations on climate change. It does not receive the attention it should be given. Agriculture entered the United Nations Framework Convention on Climate Change (UNFCCC) in 2009 and has been discussed in terms of adaptation through a series of four workshops in 2015 and 2016 under the Subsidiary Body for Scientific and Technical Advice (SBSTA). Thanks to continued advocacy from civil society organizations, the Paris Agreement, adopted during the 21st Conference of Parties to the UNFCCC in December 2015, makes various references to food security and agriculture. In the preamble, the Parties recognized ‘the fundamental priority of safeguarding food security and ending hunger, and the particular vulnerabilities of food production systems to the adverse impacts of climate change’ and then in the second article of the agreement, they committed to accelerate the transition to low carbon economies ‘in a manner that does not threaten food production’. Apart from these mentions, agriculture, food security or for that matter nutrition, are totally absent from the discussions. It seems like parties to the UNFCCC are ignoring the fact that food security and nutrition security are the very foundation of development and future generations; and that they are deeply threatened by their inaction.

In the meanwhile, States are increasingly active in the Global Climate Action Agenda (GCAA), the supposedly ‘non-state actors’ agenda for action against climate change root causes and consequences. Agriculture is particularly important in the GCAA, as an admission of the failure of political negotiations on this topic. These ‘actions’ often take the shape of public private partnerships. In agriculture, two initiatives and an umbrella alliance are attracting the attention of civil society organizations (CSO): the 4per1000 initiative, the Adaptation of African Agricultures

initiative (AAA), and the Global Alliance for Climate Smart Agriculture (GACSA). All of them tend to promote agricultural production increase in face of climate change and see agriculture as a solution for carbon sequestration in the soil. These initiatives do not have clear criteria of selection nor governance mechanisms and do not put food security as their first priority. It is also likely that their methods could also threaten farmers and indigenous communities rights to land and resources. Just as in the official negotiations spaces, the poorest and the most vulnerable to climate change are simply not represented nor defended in this action agenda.

Indeed, the most vulnerable to climate change and those who will have to live with its impacts have no voice in the negotiations and initiatives. Most negotiators are not sensitive to food security and nutrition issues as they focus on energy and emissions issues and usually depend on their Ministries of Environment. Last but not least, farmers’ movements are poorly represented at the UNFCCC and the most influential civil society movements are prioritizing environment integrity, energy transition and emissions cuts over messages on human rights and food security and nutrition.

Putting the most vulnerable, and especially children under five, at the core of climate change negotiations and commitments would suggest setting a truly rights based, people centred and ambitious pathway to inclusive and sustainable development.

Empowered Civil Society Participation for Transparency and Ambition

A deep transformation of civil society representation and involvement within climate change related institutions and processes is needed at every level to realize climate justice and ambition challenges.

Beginning at national and local levels: the elaboration of national policies, plans and commitments on climate change action are key targets for civil society. These documents are supposed to be based on the outcomes of wide consultations. Hence, local farmers, women and youth movements must ensure their voice is heard and State must pay attention to their requests. Many countries are still planning to have a National Adaptation Plan (NAP); Nationally Determined Contributions (NDC) must be updated and fully developed by 2018-2020; and some countries are even designing national climate change policies. These texts must be made food security and nutrition sensitive, by promoting best adapted agricultural practices and approaches, such as agroecology, social protection mechanisms to cover loss and damages, health systems strengthening to face new diseases and risks, water and sanitation access and climate proofing, disaster risks

reduction and preparedness, and so forth. In many countries, this requires that strengthening the capacity of local civil society movements to be part of the discussion efforts made to influence their governments accordingly. In agriculture, agroecology as a movement proposes to empower farmers and their organizations, to secure peasants' rights the right to land and access to resources. Finally, climate change should not be limited to Ministries of Environment alone. Heads of States and Governments must ensure a cross-sectoral governance approach to these issues, and make sure that the most vulnerable are part of these processes.

At the UNFCCC level, the struggle of civil society to participate in the debate is a reality. Most of the time during the past negotiations processes (elaboration of Paris Agreement, COP21, COP22), civil society organizations were excluded from key negotiation sessions. It is important to note that social movements and non-governmental organizations currently have no voice at the UNFCCC; except for the occasional consultative opinion, with a two-minute slot in a week-long discussion. In order for their voice to be heard, civil society organizations have to reach out to negotiation teams at the same level – but not with the same financial means – as industry lobbyists, and push them to defend their needs during the meetings. Transparency and participation must be guaranteed at the UNFCCC processes and meetings in order to reach an adequate level of ambition, especially concerning human rights and the needs of the most vulnerable.

Conclusion

Climate change is a threat we cannot ignore. As this article has sought to make clear, all the pillars of food security will be affected, along with all the components of nutrition security. The most vulnerable are those whose living conditions leave them most exposed to climate change related risks and whose livelihoods are more sensitive to it and whose adaptation capacity – depending on their household incomes – is the lowest. They are the children and women, the poorest, the elderly and all those who depend on agriculture, livestock, fish and other natural resources.

Putting the achievement of food security and nutrition at the core of climate change action could set up a movement for ambition. Nonetheless, this will not happen without the strengthened representation and participation of social movements and non-government organization, at both national and international levels. The most vulnerable must be given a voice and be heard.

A better involvement of other institutions working on the agriculture and nutrition areas is equally fundamental.

The Committee for World Food Security, the recognized, legitimate space for international negotiations on agriculture and food security, must take over this challenge and get more involved within the UNFCCC and its organs. Likewise, the FAO needs to develop a fully inclusive strategy on this nexus and carry it into the appropriate meetings.

Going further, climate change directly threatens most of the sustainable development goals (SDG); it could prevent the international community from achieving them or even jeopardize some hard won gains in certain areas. SDG 1 (no poverty), SDG 2 (no hunger), SDG 3 (good health), SDG 5 (gender equality), SDG 6 (clean water and sanitation), SDG 8 (good jobs and economic growth), SDG 10 (reduced inequalities), SDG 14 (life below water), SDG 15 (life on land) and SDG 16 (peace and justice) are most directly at stake. A world with global warming exceeding 1.5°C compared to pre-industrial temperatures will not meet these global goals – not by 2030, not ever. This is why it is paramount to address climate change and its impacts through ambitious mitigation and adaptation actions, along with loss and damage. Urgent action is required. Moreover, considering the impacts of climate change can no longer be an option while designing new policies; and policies concerning the food system must promote models which ensure nutrition security with no further deterioration of the environment and the climate.

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