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FOOD SYSTEMS AT RISK

NEW TRENDS AND CHALLENGES

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CONCLUSION OF SECTION 2

FOOD SYSTEM ADAPTATION AND MITIGATION: MANAGING TRADE-OFFS

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Food systems contribute to climate change with 19 to 29 percent of the total 50 $GtCO_2eq/yr$ of anthropogenic emissions. These can be categorized in direct emissions from agricultural production and indirect ones from agriculture-driven land use change, as well as emissions resulting from the activities of pre-production (manufacturing and distribution of inputs) and post-production (processing, storage, transport, refrigeration, retailing and catering). Agricultural production is by far the main source of emissions in LI and LMI countries. Although the presence of significant barriers to adopting climate-resilient and low-carbon practices, faced mainly by smallholder food producers (FAO, 2017), has been noted[9], Smith *et al.* (2008) estimated that the total mitigation potential of agricultural production could be 1.5-1.6 $GtCO_2eq/yr$, with a great share (70 percent) coming from LI and LMI countries. However, mitigation benefits and greater GHG efficiency might be slashed by growing emissions resulting from rising consumption in these countries.

Indeed, climate change will have growing implications in LI and LMI countries. By the middle of this century, higher average temperatures, changes in precipitation, rising sea levels, and an increase in the frequency and intensity of extreme weather events will result in a decline in food production and increased food insecurity, but also in more unstable yields resulting in price instability and related crises (Chapter 5.3). In addition, LI and LMI countries' food systems will have to cope with new pests and diseases, emerging pathogens – viruses, bacteria, mycoplasma and fungi – severely threatening the health of vulnerable people and exacerbating social and economic inequalities, leading to global health crises (Chapter 2.4).

In a context of increased climate stress, no global solution exists to improve the ability of LI and LMI countries' agriculture to mitigate its contribution to global GHG, and simultaneously supply a growing demand for food. If certain actions can be developed to mitigate climate change in certain ecosystems, regions or food systems (i.e. limiting agriculture-driven land use change, reducing methane emissions from rice cultivation or limiting the consumption of animal products in High Income Countries (HIC)), most of the efforts in LI and LMI countries will have to be dedicated to the necessary food system adaptations to climate change. First of all, governments will need to anticipate these drastic changes in production systems and their transformation to plan for action. Research and development institutions are essential in this dynamic process. They must provide short-term decision support and long-term perspectives, by forecasting trends and proposing measures that may be applied without social costs. Second, technical and policy interventions must be situated within a broad holistic approach, maintaining the multiple roles and functions of agriculture in rural areas. Simultaneously, it seems essential to develop resilient landscapes to reduce the dispersion of pests and diseases affecting plants and animals. Finally, HIC policies (agriculture, industry, trade, migration regulation, investments and health) have effects on LI and LMI countries situations, and improved policy coherence is necessary to facilitate action in LI and LMI countries. Moreover, concerns around regional mismatches between responsibility for climate change and adaptation costs call for global mechanisms to prevent poor producers and consumers to support most of the consequences of climate change.

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REFERENCES

FAO. 2017. *Strengthening sector policies for better food security and nutrition results: climate change.* FAO Policy Guidance note 5. Rome, 44 pp.
(also available at www.fao.org/3/i7217en/I7217EN.pdf).

Smith, P., Martino, D., Cai, Z., Gwary, D., Janzen, H.H., Kumar, P., McKarl, B., *et al.* 2008. Greenhouse gas mitigation in agriculture. *Philosophical Transactions of the Royal Society B: Biological Sciences,* 363(1492): 789–813.