

## INTRODUCTION

# Introduction: special issue on weather and climate impacts in developing countries

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### Abstract

Shocks related to weather variations have strong effects on developing countries' economies. Climate change is expected to increase the occurrence and magnitude of extreme weather events such as droughts, floods or hurricanes that strongly affect agriculture and other activities. This special issue gathers literature reviews and case studies that aim to better understand heterogeneous impacts and their transmission channels, as well as to evaluate the impact of such weather shocks on developing economies, including Sub-Saharan African countries, India and Brazil.

**Keywords:** climate change; developing countries; weather shocks

## 1. Introduction

Shocks related to weather variations have strong effects on developing countries' economies. Climate change is expected to increase the occurrence and magnitude of extreme weather events such as droughts, floods or hurricanes that strongly affect agriculture and other activities. Yet, impacts on economic performance and livelihoods, as well as adaptation strategies and their environmental feedback, could be looked at deeper and assessed more accurately.

This double special issue follows up the annual conference of the Climate Economics Chair<sup>1</sup> on 'Climate, Energy and Development'.<sup>2</sup> The objective of this issue is (1) to have a better understanding of the economic impacts of weather shocks in developing countries, as well as (2) to investigate the options to cope with climate change. The papers that have been selected encompass case studies from Africa (Ethiopia, Malawi, Uganda, Zambia) as well as Brazil and India.

<sup>1</sup><https://www.chaireconomieduclimat.org/>

<sup>2</sup><https://sites.google.com/chaireconomieduclimat.org/cec2018/accueil>

## 2. The impact of weather shocks

Impacts related to weather shocks mostly take place in agricultural sectors, which are key to developing countries' economic development. McCarthy *et al.* (2021) estimate that floods and droughts severely impact agricultural outputs in Malawi. Yet, weather shocks also impact non-agricultural sectors. Wages in non-agricultural sectors are shown to be impacted by weather events (Oliveira *et al.*, 2021); moreover, socio-economic factors closely related to development, such as education, which curb the long-term growth potential of populations, are also affected. Nübler *et al.* (2020) assess how the cognitive capacities and educational achievement of girls and boys are negatively impacted by droughts in Kenya. The transmission channels at stake are the factors influencing educational achievements, that is, the health and household wealth of the younger generation, which are negatively affected by droughts. It is important to consider the impact of climate change and weather events not only through production outcomes, but also on welfare. Consumption indicators may help to understand how supply shocks can affect demand. Aggarwal (2020) analyzes how temperature and rainfall variability influence consumption in India. The author shows that the impact differs according to the household's main economic activity: while industrial and agricultural households' consumption is negatively impacted by a temperature increase, for service sector households consumption tends to increase. The author notices that climate change is likely to foster inequalities. Nutrition can also be an interesting indicator to be used in the context of agricultural sectors in developing countries, as it allows us to bypass the key issue of market access and focus directly on well-being outcomes. Antonelli *et al.* (2020) analyze the links between climate, food intake and labor supply in Uganda. Combining econometric estimates and overlapping-generation modeling, they infer the impact of climate change scenarios on food consumption and labor. Shocks and adaptation are also likely to have not only economic, but also environmental feedbacks: strategies undertaken to cope with climate risks may influence several indicators. Focusing on land-use change, Girard *et al.* (2021) give some insight on how adaptation in the agricultural sector may interact with deforestation in a literature review focused on Sub-Saharan Africa.

## 3. Climate change adaptation practices

Extreme weather shocks make adaptation practices and strategies all the more important. With regard to practices, private and public strategies have to be distinguished. First, public policies are likely to influence the coping capacity of agricultural households. Ajefu *et al.* (2020) show how input subsidies may help households deal with the negative impact of rainfall shocks and smooth their consumption and food intake. When it comes to private adaptation, Girard *et al.* (2021) provide a comprehensive description of the risk-management and risk-coping strategies that may be put in place by agricultural households, and how the economic context may influence the choice of those strategies. McCarthy *et al.* (2021) estimate that in Malawi, green belts provide protection against floods. In contrast, there is little evidence showing that the adoption of current sustainable land management practices occurs due to the risk of weather shocks. Similarly, Alfani *et al.* (2021) show the limited impact of adaptation strategies to cope with the El-Nino related drought in Zambia and its impact on maize yields. Nshakira-Rukundo *et al.* (2021) review the factors affecting the low uptake of insurance against these shocks by households. They identify several barriers to access. Some of them are purely related to the insurance market (affordability, product characteristics), while others are more behavioral (lack of reliable information, cultural factors). Thinking of adaptation in a

broader perspective allows us to question social norms. Bezabih *et al.* (2021) show that certifying property rights is likely to facilitate the long-term investment required by some adaptation strategies.

Overall, the papers in this special issue illustrate the diversity of the impacts related to weather and climate impacts and how they are enmeshed with local socio-economic conditions. Together with adaptation and mitigation strategies, this variety of impacts brings into question the effectiveness of the actual policy instruments needed to reach the Paris Agreement objectives and their coordination with the broader Objectives of Sustainable Development. This is a topic that deserves to be further investigated.

## References

- Aggarwal R (2020) Impacts of climate shocks on household consumption and inequality in India. *Environment and Development Economics* 1–24. <https://doi.org/10.1017/S1355770X20000388>.
- Ajefu JB, Efobi U and Beecroft I (2020) Coping with negative shocks and the role of the farm input subsidy programme in rural Malawi. *Environment and Development Economics* 1–21. <https://doi.org/10.1017/S1355770X20000285>.
- Alfani F, Arslan A, McCarthy N, Cavatassi R and Sitko N (2021) Climate resilience in rural Zambia: evaluating farmers' response to El Niño-induced drought. *Environment and Development Economics* 1–23. <https://doi.org/10.1017/S1355770X21000097>.
- Antonelli C, Coromaldi M, Dasgupta S, Emmerling J and Shayegh S (2020) Climate impacts on nutrition and labor supply disentangled – an analysis for rural areas of Uganda. *Environment and Development Economics* 1–26. <https://doi.org/10.1017/S1355770X20000017>.
- Bezabih M, Di Falco S, Mekonnen A and Kohlin G (2021) Land rights and the economic impacts of climatic anomalies on agriculture: evidence from Ethiopia. *Environment and Development Economics*.
- Girard J, Delacote P and Leblois A (2021) Agricultural households' adaptation to weather shocks in Sub-Saharan Africa: implications for land-use change and deforestation. *Environment and Development Economics* 1–23. <https://doi.org/10.1017/S1355770X2000056X>.
- McCarthy N, Kilic T, Brubaker J, Murray S and de la Fuente A (2021) Droughts and floods in Malawi: impacts on crop production and the performance of sustainable land management practices under weather extremes. *Environment and Development Economics* 1–18. <https://doi.org/10.1017/S1355770X20000455>.
- Nshakira-Rukundo E, Kamau JW and Baumüller H (2021) Determinants of uptake and strategies to improve agricultural insurance in Africa: a review. *Environment and Development Economics* 1–27. <https://doi.org/10.1017/S1355770X21000085>.
- Nübler L, Austrian K, Maluccio JA and Pinchoff J (2020) Rainfall shocks, cognitive development and educational attainment among adolescents in a drought-prone region in Kenya. *Environment and Development Economics* 1–22. <https://doi.org/10.1017/S1355770X20000406>.
- Oliveira J, Palialol B and Pereda P (2021) Do temperature shocks affect non-agriculture wages in Brazil? Evidence from individual-level panel data. *Environment and Development Economics* 1–16. <https://doi.org/10.1017/S1355770X21000073>.

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