

IGC Policy Brief Template

Purpose: Policy briefs help research to shape policy.

Dissemination: They will be delivered to policymakers by IGC Country Teams, the website and workshops, conferences and wider media.

General Instructions: This guidance is intended to support the purpose of the policy brief: Please limit your brief to 2 pages of text, excluding visual aids, using a non-technical and straightforward language. Please cover all of the following sections.

Title: *Title of Project*

Authors: *List name and main affiliation for each person*

Short summary paragraphs:

- I. **Policy Motivation for Research:** *the policy and research question(s) addressed by this project, and a brief explanation of why they are crucial for policy-making in targeted countries*
- II. **Policy Impact:** *what decision or policy will be shaped as a result of this work*
- III. **Audience:** *the audience or key decision makers targeted by this brief*

Main sections:

- IV. **Policy Implications:** *Identify the key messages on the policy implications of your research in bullet point form. Please use one sentence providing a brief description of each bullet together with one paragraph that accompanies each bullet to substantiate or explain further the bullet.*
- V. **Implementation:** *Please provide guidance for policymakers as to how to implement policy measures based on the implications of your research by devising a number of 'action points'. Please discuss constraints that could arise in the implementation of these 'actions points' and suggest ideas on how to confront those. If applicable, please also discuss issues in replication of results, or in scaling up, or any cross-country experience, that arise in thinking about implementing decisions that would be influenced by your research.*
- VI. **Dissemination:** *Please suggest individuals or institutions, along with emails and/or postal addresses that you would like the IGC to send soft and hard copies of your final working paper and policy brief. Ideally, we would like to disseminate IGC findings to those in the policymaking community in developing countries in Africa and South Africa.*
- VII. **Further Readings:** *a brief (non-technical) list of related writing.*

IGC Policy Brief Evaluation

Title: *Climate Change Volatility and Crop Choices*

Authors: *Giacomo De Giorgi (Stanford University, BREAD, CEGA, CEPR, and NBER)*

Luigi Pistaferri (Stanford University, CEPR, and NBER)

General comments:

Climate change has generated much attention. Upward trends in average temperature are well documented facts. While somewhat less attention has been devoted to the impact of the increase in climate volatility on behavior is relatively less studied. In standard models with uncertainty or risk, precautionary behavior, and lack of formal insurance, agents self-insure by building up assets, or engaging in other type of behavior designed to reduce to impact of risk on outcomes. The goal of our project is to look at the impact of increasing climate volatility on choices made by farmers around the world, and in particular in developing countries. This first note provide a data description for several data sources as well as a descriptive analysis of the relationship between crop yields, farmed land and number of farmed crops and long-run temperature volatility.

Evaluation and feedback: valuation and feedback:

Policy Motivation

- The change in volatility of weather, a fundamental input in the agricultural production function, might have dramatic consequences for farmers, in particular in developing countries. In this paper we organize and describe a set of diverse, publicly available, data to motivate further work in the area of climate volatility and its effects on households' behaviour.

Policy Impact

- We establish a series of facts about the time series and cross-sectional profiles of temperature and rainfall. In particular, we confirm the general increase in average temperature recorded in the past decades, with however a large degree of heterogeneity across space.
- Second, and more importantly for our project, we establish some facts about the evolution of weather risk, expressed in terms of the (residual) volatility of temperatures and rainfall.
 - (a) the (yearly) coefficient of variation of temperature is increasing over time;
 - (b) there is a significant spacial heterogeneity in the estimated changes in the volatility of temperatures, with some countries and locations experiencing a large increase, and others a large fall in volatility.
- For rainfall the picture seems quite different:
 - (a) on average the residual volatility seems to be falling over time;
 - (b) there is again a significant amount of heterogeneity in the data when organized by country or location.

- We document a preliminary and descriptive relation between temperature volatility and crops production, cultivated land and number of crops planted and harvested. Such a preliminary evidence points towards the need of further research in the area of the effects of climate uncertainty. We document an overall negative relationship between yields of a number of crops and the temperature volatility. This should generate further discussion on how to insure households against risk.

Audience

- The audience of this brief is rather wide given the topic covered as well as its descriptive nature.

Policy Implications

- The policy implications could be rather crucial as policy makers would need to consider the case of providing smoothing technologies to farmers, for example as formal insurance against volatility or provision of new farming technologies and crops that are more resilient to weather variability.
- It is however too early to base policy recommendations solely on the basis of our descriptive results. A large amount of supplementary work is needed in order to provide precise policy recommendations. We can here only mention some of the possible policies, but this would be highly speculative and preliminary and therefore to be only taken as such. As mentioned a great deal of work is needed. We see this as a first step towards a better understanding of the relationship between weather uncertainty and households' behaviour.
- **Possible policy interventions to be considered:**
 - Weather insurance
 - Provision of resilient crops
 - Farming advice on how to cope with volatile weather

Dissemination

- Given the descriptive nature of the paper it would be too early to direct this note to specific subjects.

Implementation

- N/A