



# Economic Assessment of the Impacts of Climate Change in Uganda

## National-level assessment

## Climate Change and Agriculture

### Introduction

The agricultural sector is a fundamental part of the Ugandan economy, employing about 66 percent of the working population in 2009/10 and contributing about 22 percent to total GDP in the year 2012 (UBOS, 2013). This brief reports on the findings of a recent study to assess the economic impacts of climate change on agriculture. The report assessed the potential economic impacts of climate change on (i) food crops (ii) livestock and (iii) export crops. It has also made an assessment of the current and future economic impacts of droughts and floods on agriculture in Uganda.

### Estimated Impacts

#### Food Crops

The overall aim of the economic assessment of food crops was to estimate possible future losses of these products and of their economic value, comparing selected climate change scenarios with a no climate change scenario.

**Under the scenarios considered overall losses for food crops by 2050 are not likely to be more than US\$1.5 billion and could well be less. Under the**

**assumed growth in the economy this would be less than 0.2 percent of GDP in that year.**

Other key preliminary findings include:

- Results for production and value changes show great divergence between different climate models, and different regions (with the largest impacts in the East and North for all crops).
- Most of the 11 modelled food crops show reductions in total national production under almost all climate change scenarios to 2050 (e.g. cassava, maize, millet, groundnuts); some cases show both increases and decreases depending on the model (e.g. maize).
- For some crops the impacts on production of climate change in 2050 are quite significant in percentage terms (e.g. cassava, potato and sweet potato show around 40 percent reductions). In most other cases, the percentage reduction is less than 10 percent (e.g. millet, sorghum and pigeon peas).

#### Livestock

Estimated impacts on livestock production are quite small in all cases (1 or 2 percent). However, this modelling is only for yield and area whereas the key impacts on livestock may come from other climate change factors, in particular droughts, floods and diseases.

## Agricultural Exports

Agricultural exports represented about 50 percent of the total export value of Uganda in 2013. Coffee contributes about 18% of total exports. Climate induced yield losses for coffee could be in the order of 50-75% by 2050, as a result of a combination of yield reductions and (more importantly) loss of areas where coffee can be grown. An illustrative estimate of the value of losses due to a 50% reduction in production of Arabica and Robusta coffee combined, would be about US\$1,235 million in 2050. The value of losses in a 75% reduction scenario would be about US\$1850 in 2050.

Estimates of impacts on tea growing areas also indicate significant losses of value and some potential losses of cotton production are projected.

Taken together these results indicate the potential for Uganda agricultural export production and value to be strongly affected by climate change in the period up to 2050 in the absence of adaptation actions. **Losses due to a 50% reduction in production of coffee and tea combined may cost about US\$1,400 million in 2050.**

## Extreme Events

**For some agricultural products the threat from droughts and floods appears to be more important than the threat from decreased yields.**

It is widely accepted that extreme weather events have been increasing and becoming more severe in recent years. To give an indication of the order of magnitude of current losses, these are estimated to be about US\$470 million to food crops, cash crops and livestock as a whole, resulting from the 2010-11 drought (OPM (2012)). This equates to about 16 percent of the total value of these items in GDP for 2011. The annual damage figure of US\$47 million to crops from the 2008 drought (given in NEMA, 2008) is equal to approximately 3 per cent of the value of all cash and food crops.

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Contact: [olivier.beucher@baastel.com](mailto:olivier.beucher@baastel.com)

## Adaptation Priorities

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**Overall this report concludes the immediate priority in terms of adaptation action is the threat from droughts and floods. It is already present and needs urgent action.**

In addition, the Government of Uganda, in its National Climate Change Costed Implementation Strategy, has identified eight areas of adaptation for the agricultural sector, with a proposed budget over the next 15 years of about US\$297 million (MWE, 2012). **The proposed strategic interventions deal with current climate variability and can be justified in economic terms on those grounds.** Hence they are part of addressing the adaptation deficit and if implemented effectively, should provide benefits irrespective of future climatic change. The study concludes that:

- Most of those adaptation actions that have medium to long term benefits need to be initiated now because it will take time to test pilot versions and develop programmes that are robust.
- Evidence from the existing literature and from this study suggests that the benefits of many of the proposed measures are potentially high relative to the costs.
- In terms of timing, most of the proposed actions could yield some benefits in the short to medium term, making them more urgent in terms of implementation.

Of course in no case is the evidence from other studies a guarantee that the implementation of the measures in Uganda will be successful and cost effective. The programme needs to be evaluated at the national level on a case by case basis and implementation has to be technically and economically efficient.

A quantitative assessment of those interventions needs a bottom-up analysis of the costs and benefits, which has to work from the local level. Some examples of this will be undertaken in case studies implemented in the Karamoja and Mount Elgon region.