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Climate change and economic development in Africa– research priorities

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Rhetorically, climate change has shifted from a standalone scientific and environmental concern to one of the defining developmental challenges of our century. Africa is already severely afflicted by increasing climate woes, which will worsen even under the most optimistic scenarios and threaten to reverse developmental achievements to date. Yet few African countries have so far responded commensurately. There has certainly been a surge in projects and initiatives addressing climate change on the continent over recent years. But in most countries, climate matters remain under the purview of specialized agencies (e.g. environmental and disaster risk reduction authorities), rather than being addressed at a more strategic level and mainstreamed in to development planning and programming.

One important impediment to the active involvement of planning and finance ministries in the formulation and delivery of climate change policy responses is the lack of relevant policy-oriented economic research. This note will highlight the deep interconnections between climate change and economic development and pinpoint areas where further economic research may contribute to improved policy responses.

Climate change and economic performance

In considering the linkages between climate change and economic performance it is helpful to distinguish between three related sets of interactions. First, climate change directly affects a country's economic fundamentals and development prospects. Second, economic factors (e.g. structure, fiscal space, policies, property rights etc) and institutional factors, including those related to governance (e.g. participation, representation, accountability) are important determinants of the welfare effects of climate shocks and stresses. Third, global responses to climate change (e.g. emissions control regime, technology transfer mechanisms, financing for adaptation and mitigation etc) will have far reaching economic implications, which need to be better understood. These will be elaborated on in turn.

African economies will be worst affected by climate change, because the continent faces more severe climatic effects than other regions, and its peoples and economies are highly dependent on climate sensitive sectors (e.g. agriculture, forestry, tourism). The recent Stern Review highlights that 81% to 97% of Africa's plant species are likely to be affected, with 25% - 42% of plant species possibly being deprived of any suitable habitat by 2085 (Stern, 2007). At an aggregate level, even a 2°C increase in temperature – which is the minimum level of warming expected – could cause permanent GDP losses of 4-5% for Africa (World Bank, 2009). Micro-level studies focusing on the impact on key crops in African agriculture suggests market impacts will be of the order of losses of US$16-36 billion (Kurukulasuriya and Mendelsohn 2008; Dinar et al 2008). These are likely to be underestimates.

Climate change is expected to significantly erode the human, physical and natural capital that make up a country's wealth. African economies are often clustered around natural resource rich zones that are very sensitive to climate variability. Over a quarter of Africa's population resides within 100 km of a sea coast, and are hence greatly exposed to sea-level rises, storm surges, cyclones and coastal erosion, all of which are set to worsen with global warming. Human capital is further threatened by the spread of hunger and disease: Africa's biggest killers (e.g. malaria, yellow fever, cholera) will be bolstered by climate change, while weather-related reductions in crop yields could significantly increase food insecurity across the continent[1]

Economic factors are important determinants of how climate effects translate in to social welfare changes. Given the profound uncertainties involved in predicting local climate effects, no country can fully climate-proof its economy. However, structurally balanced and diversified economies with fiscal resources, clear property rights regimes, growth drivers delinked from climate sensitive sectors and developed markets for credit and insurance will be more resilient to climate change impacts. By contrast, African economies are for the most part dominated by the climate sensitive primary sector – with agriculture accounting for around 60% of overall employment and in some countries, more than 50% of GDP –

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[1] According to a recent report by the International Food Policy Research Institute (IFPRI), even if there was no climate change 42 million children are likely to be malnourished by 2050. With climate change, this number is likely to increase to 52 million (nearly a 23% increase, with and without CO_2 fertilization effects (Nelson 2009).

have weak land tenure systems, and underdeveloped credit and insurance markets.

Finally, a post-Kyoto international climate framework will have profound implications for national economies. Any global scheme to price carbon – whether through taxation or a cap-and-trade regime - will affect relative prices, which in turn will affect terms of trade and comparative advantages. And the prospect of unlocking new additional sources of funding for climate change adaptation/ mitigation in developing countries will have huge ramifications for public financial management, and possibly also for governance and export competitiveness. Understanding these interactions will be crucial to enabling African countries to secure their space to grow economically in an increasingly carbon-constrained world.

Economic research gaps and priorities

The growing sense of urgency over the need to address climate change has been matched by a rapid increase in both theoretical and applied analyses of climate change economics. The theoretical literature has been concerned mainly with questions of valuing climate change damages, discounting, managing risk and uncertainty, incentivizing collective action, and the design of optimal policy instruments. Much of this has been at a macro level, very often at the global level. As regards applied research, numerous top-down studies have been conducted, which quantify climate change impacts, the costs and benefits of remedial action and of inaction, and the welfare effects of policy responses to address climate change in particular countries and sectors.

These studies have been useful in providing analytical frameworks for assessing climate change impacts and policy responses, and in directing attention to the economic dimensions of the climate change challenge. However significant gaps remain in both the analytical and the empirical literature, particularly at the country and sub-regional levels in Africa. Analysis of how the impacts of climate change – e.g. on people, institutions and the environment – are mediated through the markets (e.g. for labour, capital, inputs etc) is largely absent in African contexts. Given the potentially enormous distributional effects of climate change, there will also need to be rigorous analyses of political economy aspects of climate policies.

The implications of long-term climate change on decision-making processes at the household, firm and government levels are at the heart of behavioral adjustments that are required for a move towards low carbon climate resilient development. These microeconomic dynamics need further investigation. Further work is also needed on the implications of climate change on poverty and social protection, trade and capital markets, finance and the political economy. Finally, there is a dearth of macroeconomic research on the interactions between climate change, climate policy responses and other inter- and intra-country determinants of macroeconomic performance.

Conclusion

The deep inter-connections between economic and climate factors, the economy-wide nature of climate change impacts, and the profound economic implications of international climate agreements all argue in favor of increased integration between climate and economic policies. This short note has sought to highlight some key areas for economic research that will help equip economic and planning authorities in African countries with the knowledge to develop effective policy responses to their climate and developmental challenges.

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