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How can climate information support long-term development objectives?

Adapting to climate change is a challenge that spans timescales. While communities are feeling the effects of climate change now, the most severe impacts will be felt in decades to come.[1] This presents significant obstacles to long-term development objectives. Nowhere is this more apparent than in sub-Saharan Africa, a region confronting a large current adaptation deficit and undergoing rapid social, economic and demographic transitions.[2] Factoring medium- to long-term climate information (associated with interannual, decadal and multi-decadal timescales) into investments and planning decisions can therefore play an important role in guiding climate resilient development and helping to safeguard economic development across the region.

While effective adaptation clearly requires more than just an understanding of future climate risk,[3] the importance of promoting the uptake of medium- to long-term climate information often centres around two arguments. Firstly, it can support anticipatory adaptation and help to identify long-lived investment and planning decisions in the face of changing external stressors.[4] Secondly, it can assist decision makers to identify and manage the risk of current actions leading to increased levels of vulnerability in the future.[5] In particular, long-term interventions with long-lived implications – such as national or sector development plans, strategies for economic growth and large infrastructure investments – offer clear entry points owing to the scale of investments and operational time frames involved.[6]

However, findings from case study research conducted under the Future Climate For Africa (FCFA) programme suggest that many sub-Saharan countries are failing to incorporate medium- to long-term climate information into core national development processes.[7] This is despite recent gains made in promoting the uptake of short-term climate information (associated with weather, sub-seasonal and seasonal timescales) in decision making across Africa.[8]

Here we argue for a step-change in how medium- to long-term climate information is produced, communicated and acted upon in order to achieve meaningful impact on decision making in sub-Saharan Africa and elsewhere. In particular, we identify needs on the part of all relevant stakeholders to: address the communication mismatch between producers and users of climate information; tailor climate information to the needs of relevant decision makers; encourage greater recognition of the political economy of sub-Saharan African decision making; and adopt a more nuanced appreciation of the ethics of promoting a long-term climate agenda in a world dominated by short-term political timeframes and immediate development priorities.

A shortfall in knowledge and data

The reasons for poor uptake of medium- to long-term climate information in sub-Saharan Africa are manifold. To begin with, our scientific knowledge of past and current African climate is poor relative to other regions, and large gaps exist in the observational record. Opportunities therefore exist in enhancing the quality and quantity of observation networks and infrastructure, as well as recovering large swathes of historical data yet to be digitised. There is also a pressing need to build the capacity of African climate scientists and scientific institutions in order to: support the extension of observation networks; take ownership of quality assurance and data assessment; and, together with appropriate boundary agents, lead efforts to promote better disseminating and understanding of medium- to long-term climate information amongst all relevant stakeholders.

However, scientific and technical barriers account for only a fraction of the impediments to information uptake. Findings from across the FCFA case studies highlight how social, economic and political factors also act as significant barriers to the use of medium- to long-term climate information.[9] In particular, the immediacy of development challenges inevitably focuses decision makers' attention on shorter timescales. For instance, Maputo in Mozambique and Accra in Ghana both currently experience high climate vulnerability which affects drainage and transport infrastructure, leading to health impacts and economic disruption[10]. High discount

rates and large uncertainties over future climate change further reduce the incentives, and political will, to account for long-term climate in many investments[11]. Insights from the Malawi case study also highlight how even in contexts where long-term national development strategies do exist, the majority of government budgeting, resource allocation and target-setting decisions are dictated by shorter-term national development plans that operate on 3 to 5 years planning cycles.[12]

Promoting the uptake and use of climate information is, therefore, not just about improving our understanding of the African climate, but responding to social, political and economic realities.

Production and dissemination

One clear priority is to address an apparent communication mismatch: information delivered to African decision makers is often overly technical, prone to misunderstanding of associated uncertainties, and ill-suited to decision makers' needs.[13] Care needs to be taken to ensure that climate information speaks directly to the practical questions to which decision makers seek answers. [14] In the Zambia case study, for example, decision makers highlight how the current practice of disseminating information in relation primarily to changes in annual average temperature or precipitation is of little practical use. Rather, information on decision-relevant events such as changes to the onset of the rainy season, frequency and duration of dry spells early in the growing season or water availability for irrigation has far greater significance to local and national decision makers.[15] This is particularly evident for countries and regions where rainfed agriculture accounts for a large proportion of livelihood and economic income.

Communication of climate information also requires active involvement of a number of stakeholders at different levels, from scientific institutions to government departments and local communities. There is considerable scope to enhance the roles played by 'boundary organisations' in sub-Saharan Africa, promoting more effective dialogue between producers and users of scientific information.[16] In assessing the capacities of boundary agents in Malawi,

Zambia, Mozambique, Ghana and Rwanda the FCFA case studies find few organisations that have the skills and mandate to convene, collaborate, translate and mediate between different stakeholders. Unfortunately, this situation is mirrored across much of sub-Saharan Africa.[12] Improving the uptake of climate information into policy requires expanding the remit of those organisations that have the influence and capacity to act - such as the Africa Climate Policy Centre (ACPC) and Regional/National Climate Outlook Forums (RCOF/NCOFs) - as well as supporting new boundary organisations that can promote greater dialogue between producers and users of climate information at various levels of governance.

Communicating the merits and limitations of climate information to decision makers, as well as supporting the use of more pragmatic and evidence-based approaches to decision making under uncertainty will be key. The Rwanda case study finds that policy makers are using a range of different sources for the projections of future climate change, including secondary sources and general web portals. This includes information that is clearly inappropriate for adaptation decisions, e.g. where single climate model simulations are cited with high confidence.[17] Authoritative national projections of climate change across sub-Saharan African countries could help manage the risk of inappropriate data use. These would build on the local understanding of the current climate and be altered as new research emerges. Consistent projections are vital to underpin guidance on interpretation of climate information (and uncertainty) across a range of stakeholders – government, civil society and the private sector.

Power and politics

Alongside knowledge and communication gaps, many barriers to uptake relate to issues of political economy and governance. Overlapping organisational mandates, hierarchical structures of governance and weak incentives to include medium- to long-term climate information in decision making are each significant obstacles. For example, adaptation often falls under the mandate of typically weaker line ministries, such as those responsible for environment and natural resource management. More influential line ministries, such as those

responsible for finance, development and planning, need greater incentives and the mandate to act on long-term climate information if adaptation is to happen at scale and be mainstreamed into policies that make a difference to people's lives.

With this in mind, more effective understanding and communication of the economic benefits of acting on medium- to long-term climate information are key to enhancing its uptake amongst more influential stakeholders. It also requires greater inter-ministerial cooperation and coordination, coupled with institutional capacity building. Few sub-Saharan countries have instigated such transitions. Where efforts have been made, it is often by capitalising on political windows of opportunity and leveraging high-level 'champions' that drive the climate agenda forward. In Rwanda, for example, President Paul Kagame's backing for national action on climate change, alongside the involvement of relevant government ministries, is a crucial driver of the mainstreaming of climate change into national economic development strategy.[18]

It is also important to note that many of the scientific, political and institutional challenges highlighted here relate not just to the context of sub-Saharan Africa, but are common across all regions and continents.[19]

The ethics of climate information in a short-term world

Promoting the use of climate information in long-term decision making also raises important ethical questions. For example, given current low-demand for the inclusion of long-term climate information in core development processes across sub-Saharan Africa, should funders, governments and knowledge brokers be supporting work in this area? As the loudest proponents in promoting the uptake of long-term climate information come from outside the continent, it is easy to see how concerns over neo-colonialism and external influence may arise – similar to accusations of 'carbon colonialism' seen in the mitigation arena.[20] In contexts where a lack of demand amongst African decision makers arises from a misalignment with underlying

value systems, or where immediate development needs are strongly prioritised, promotion of a long-term climate agenda needs to be approached with considerable care.

Another ethical challenge concerns the target audience for longer-term climate information. For now, most efforts are focused on national and regional policy-makers as this is where many of the decisions around long-lived infrastructure and development planning take place. Yet this excludes local communities and individuals. More could and should be done to involve local actors. However, dissemination of uncertain long-term climate information at scale, when users may not be fully aware of its limitations, may create more harm than good.

Furthermore, should long-term climate information highlight the need for deeper transformational change – as the scale of many adaptation challenges implies – then additional ethical questions are likely to be raised, particularly in contexts where systems of governance might lack accountability, transparency and legitimacy. Whose voices are heard? Whose interests are best served? Are transformational actions likely to further reinforce the marginalisation of vulnerable groups?

More should be done to recognise the ethics of promoting long-term climate information in investment and planning decisions. However, the concerns highlighted here they do not mean that the generation and uptake of long-term climate information should be discouraged. Far from it: we argue that there is a moral imperative to act on relevant knowledge that can reduce future risks, save lives, and safeguard health and livelihoods.

For a start, it is paramount that any intervention aimed at promoting the uptake of medium- to long-term climate information adheres to principles of honesty, precision, transparency and relevance.[21] However, ethical considerations need to go far beyond introspection and openness, towards a fundamental shift in how climate information is generated, communicated and taken up. Doing so means promoting meaningful processes of dialogue between producers and users of long-term climate information, including those people most vulnerable to climate change.

Such dialogue cannot be a one-way flow of information and should recognise the different interests and agendas promoted. For example, 'co-production' and 'co-exploration' models of engagement encourage interaction between producers and users of climate information at all stages of information generation. Both groups are able to share respective knowledge, have their traditional ways of thinking challenged, and are allowed to shape the research agenda.[10] In addition, novel approaches to communication such as 'serious gaming', participatory scenario planning and other forms of experiential learning may hold the key to allowing different communities of practice to understand and appreciate each other's knowledge and perspectives.[15]

Two-way dialogue is likely to encourage greater local ownership of climate information. This can help to addresses ethical concerns about externally imposed agendas and is cited as a key reason behind the low priority given to its integration in local and national decision making across sub-Saharan Africa. Improved dialogue also allows for more open and frank discussions around difficult issues that require better decision support tools, such as comparing the costs and benefits of proposed activities that accrue across timescales or how to best make decisions under conditions of uncertainty.

In conclusion, we argue that resolving ethical challenges is both technical and political, requiring nuanced appreciation of how climate information fits into a complex decision-space. Researchers, funders and development practitioners can gain considerably from a greater understanding of local decision contexts and value systems, as well as developing more meaningful local and national partnerships. Enabling these changes also requires a move towards long-term funding and planning cycles, greater flexibility in the delivery of adaptation and development activities to account for uncertainty and non-linear change, and more user-driven research agendas.

[1] Oppenheimer, M. *et al*. *In: Climate Change 2014: Impacts, Adaptation, and Vulnerability.* (Cambridge University Press, 2014).
[2] Ford, J. D. et al. *Regional Environmental Change*, 1-14 (2014).
[3] Dessai, S., Hulme, M., Lempert, R., & Pielke Jr, R. *In: Adapting to climate change: thresholds, values, governance*, 64-78 (Cambridge University Press, 2009).
[4] Wilby, R. L. *et al*. *International Journal of Climatology*, **29(9),** 1193-1215 (2009).
[5] Agrawala, S. *et al. Climate and Development*, ***4*(1),** 26-39 (2012).
[6] Giordano, T. *Utilities Policy*, *23*, 80-89 (2012).
[7] http://cdkn.org/future-climate-africa/
[8] Hansen, J. W., Mason, S. J., Sun, L., & Tall, A. *Experimental Agriculture*, **47(02),** 205-240 (2011).
[9] Eisenack, K. *et al. Nature Climate Change*, **4(10),** 867-872. (2014).
[10] Steynor, A. et al. *Report from the Future Climate for Africa Pilot Country Case Study project* (University of Cape Town, 2014)
[11] Jones, L *et al. Promoting the use of climate information to achieve long-term development objectives in sub-Saharan Africa: Lessons from the Future Climate For Africa scoping phase* (Climate and Development Knowledge Network, 2014)
[12] Vincent, K. et al. *Actual and Potential Weather and Climate Information Needs for Development Planning in Malawi: Results of a Future Climate for Africa Pilot Case Study* (Kulima IDS, 2014)
[13] Shackleton, S., Ziervogel, G., Sallu, S., Gill, T., & Tschakert, P. *Wiley Interdisciplinary Reviews: Climate Change* (2015).
[14] Vaughan, C., & Dessai, S*. Wiley Interdisciplinary Reviews: Climate Change*, **5(5),** 587-603 (2014).
[15] Koelle, B *et al. Future Climate For Africa Pilot Phase: Zambia* (Red Cross Red Crescent Climate Centre, 2014)
[16] Shaw, J., Danese, C., & Stocker, L. *Ocean & Coastal Management*, **86**, 80-87 (2013).
[17] Watkiss, P. *Future Climate For Africa final report: Rwanda pilot* (Global Climate Adaptation Partnership, 2014)
[18] *Green Growth and Climate Resilience National Strategy for Climate Change and Low Carbon Development* (Republic of Rwanda, 2011).
[19] Bruno Soares, M., & Dessai, S. *On the use of seasonal to decadal climate predictions for decision-making in Europe* (Sustainability Research Institute, 2014).
[20] Bumpus, A. G. & Liverman, D. M. In: *Global Political Ecology,* 203-224 (Routledge, 2011).
[21] Keohane, R.O., Lane, M. & Oppenheimer, M. *Politics, Philosophy & Economics* **13(4):** 343–368 (2013).