Climate Change Adaptation in Africa:
Nairobi Team Contributions to Knowledge on Climate Change Adaptation

Introduction

This report highlights some of the contributions to knowledge on climate change adaptation that the Nairobi team has made as part of its activities. It does not attempt to review or evaluate all of the activities of the organizations that compose the team. The report is based on interviews with team members, observations made during field visits, and discussions during the final roundtable project wrap-up meeting in November 2012. For each of the case studies, the report seeks to answer 2 questions:

1) What did this project unveil about climate change adaptation?
2) What avenues for further research has it opened up?

Climate change adaptation is a growing and already quite large field of research, activism, and project design and implementation. There are multiple windows into adaptation. The more mainstream approaches tend to see climate change adaptation through the window of vulnerability and resilience. What, they ask, are the multiple social, economic, and physical sources of vulnerability to climate change? What measures can be taken and with which actors to increase adaptive capacity and resilience?

In addition to these more mainstream approaches, it is possible to look at adaptation more thematically, for instance, through the windows of HIV and AIDS, gender, food and water security, impelled/forced migration, north-to-south financing, and so forth. Focused specifically on the complexities of one topic, each of these windows can reveal new and unexpected dimensions to the challenge. Looking at adaptation through HIV and AIDS, for example, we might ask how the effectiveness of antiretroviral regimes is affected by food disruptions due to climate change. Or we may inquire into how the socioeconomic conditions that increase women's vulnerability to infection—particularly those that create or worsen gender inequalities—will change as new climatic states interfere with existing livelihood strategies.

The team project reviewed in this report used this latter thematic approach, looking onto climate change adaptation through the window of water governance. One unique feature of this project, however, is how it has assembled a team of researchers and civil society organizations that themselves sometimes approach water governance through unique windows. In the end, it formed a complex "windows into a window into climate change" structure that revealed some remarkable findings.

Such a complex approach risks drawbacks. The insertion of climate change adaptation into the activities of organizations formed primarily to take on quite different issues may require an initial period of learning, adjustment, and capacity building; it will take some time to discover the linkages between climate change and the issues the organization works on, and the best strategies for acting on them. In some instances, climate change might in the end prove not be a natural or even compatible fit with an organization's activities. At the team level, it may also be challenging to identify an overarching set of

goals that gives coherence and reason for coming together in unity of purpose while also satisfying each organization's objectives.

Nevertheless, such a complex approach may also be appropriate at this still-early stage of climate change adaptation for several reasons. First, it is necessary to understand how climate change can become relevant to marginalized communities for whom adapting to its effects is not as pertinent as the efforts to satisfy more basic needs. Climate change may not be sufficiently detectable to be identified as an immediate concern. Showing how it will affect—or is already affecting—those matters communities are already deeply concerned about and have organized around provides a way to demonstrate the relevance of climate change right now. The pathways that allow marginalized communities to perceive and then act on climate change are in many cases still being discovered, and this project is part of that discovery process. Good civil society organizations (CSOs) are deeply integrated in the community. They are able to detect the subtle, complex, and even surprising ways climate change will enter into and affect the community's wellbeing.

Second, climate change will have far-reaching, unexpected effects, challenging the activities and goals of a wide range of NGOs, CSOs, and government actors. Indeed, the practice of *mainstreaming* climate change into the activities of diverse government ministries throughout the world is in part because of the increasing recognition that their activities will be negatively affected if climate change is not taken into account. So while there is a risk of creating incoherence in the overarching team goals, the diversity of the groups involved might instead be a strength, knitting together a larger network that can share and compare unique discoveries made during their respective activities—and, if properly organized, can amplify the effectiveness of political advocacy on the issue.

Climatology can forecast the physical effects of climate change, but the social and economic effects are less predictable. Part of the strength of the approach taken here was its ability to predict some possible unexpected, second-order effects of climate change that are not at all obvious when thinking about climate change adaptation.

Kilimanjaro Initiative (KI)

The Kilimanjaro Initiative originated in the wake of a tragic shooting incident and was formed to provide youth with alternatives to violence. Its main activities involve youth leadership development through sport, but the deep connections these activities have laid within the communities it works with has allowed KI to expand into and pursue diverse activities.

Among its multiple activities, KI has been involved in participatory decision-making projects directed towards community revitalization. One of its most impressive projects is centred on the creation of a vibrant public space in Silanga village in the informal settlement of Kibera, the centrepiece of which is a formerly degraded and unused soccer pitch that had become a site of crime. After KI's involvement in initiating major upgrades (which involved levelling the field, draining it, sculpting it), the soccer pitch became a popular venue. Community members come here to play and watch soccer, which can be especially fun and exciting during tournaments or novelty matches such as those between teams of elder women. The field can also be used to hold performances, to take part in polling events, or to simply relax. This rare open area amidst Kibera's very dense agglomeration of informal housing and small business structures has also attracted the attention of numerous community stakeholders who have realized the wider potential of creating a vibrant, multi-use public space centred on the pitch. The pitch sits next to a primary school, and next to that sit several pre-existing community garden projects. Nearby buildings have been identified that are beginning to be used for community events like weddings or extra-curricular activities like boxing and karate. Stakeholders have recognized several opportunities to raise revenues through the site, improving its sustainability. These opportunities include craftwork, gas sales from biodigesters, food sales from the community gardens, rental of buildings for community use, and nominal fees to use the soccer pitch (which would go towards its upkeep). A participatory process was initiated in order to plan the development of the pitch.

First, a series of participatory stakeholder meetings were held, allowing a wide range of ideas, priorities, and concerns for the site to be expressed and recorded. The next step involved interpreting the results and representing them visually in such a way as to incorporate as many ideas as possible. The visual map was then presented back to the community to either reject or approve. If rejected, the visual map would be redrawn and presented again for another round of community comments and evaluation, and the process repeats if necessary. The process has resulted in a complex web of interrelations between the different sites.

Members of KI have been key participants in the community stakeholder deliberations to decide on the use of the site. Alongside other development-through-sports organizations, they have stood firm on ensuring that the size of the soccer pitch is not compromised as part of the complex community negotiation process that must somehow accommodate as many of the different interests into a limited space as possible. Members of KI have realized that the project depends on the soccer pitch, a pitch that is able to host competitive soccer in order for the other stakeholders' ideas to work. The upgraded pitch

is what has opened up the public space and is the reason the space has remained safe, alive, and vibrant. The pitch is what the community wanted collectively; the other projects become viable due to people coming to the soccer field. They are "pegged" into the pitch. Without this shared anchor, the other stakeholder projects have no shared staging point.

Contributions to Knowledge

Referring back to the idea of "windows into windows into climate change," what can sports working to revitalize public spaces reveal to us about water governance in a time of climate change?

1) ***Sports and Community Networks***. Not all of the insights into water management in a time of climate change come directly through sports, but rather from how sports connects a community and creates networks of trust. These networks can bring people together to discuss water-management issues.

KI has deep roots in Silanga and was able to organize and host presentations by community members on water issues experienced in Silanga in one of the buildings pegged into that public space. One of the themes discussed by presenters concerned the strategies people used to deal with floods, which were indicative of the community's adaptive capacity. Some made their own sandbags and piled them at their doorsteps to prevent water from entering their households. In other cases, large stones were placed between the house and the river to keep the house from floating away in the floods. When things got worse, they dug to increase the depth of the stream. Another strategy was to prevent some spaces from being used to build houses, for example in flood-prone areas. This last point introduced a second important theme from the discussions: the difficulty of managing space through the village's demographic transitions.

Silanga has grown considerably in population, but has mostly remained static in physical size. It also hosts the marshy remains of the Nairobi dam, a once-popular recreation area now overrun with water hyacinth and garbage, and prone to flooding into nearby residential areas because there is no functional drainage. Older residents at the presentation recalled a time when space was managed to ensure footpaths and roads through the community remained spacious enough to accommodate traffic. Newcomers needing land on which to build their homes did not or could not observe the measures used to reserve space for traffic flows. These stories raised questions on how space can be managed in informal settlements in a time of climate change and extreme hydrological events in order to discourage people from building residences in hazardous areas.

2) ***Space-Management through Sport***. The public appreciation of sport offers a unique strategy for managing space. A key realization KI has made is that the space the soccer pitch uses is space that cannot be used for other purposes, thus creating a means of managing available building space. As Issa (Forthcoming) writes, "The more sports fields we can build near the river where it floods, the fewer people's houses will get inundated

or washed away. We are working with the city government to resettle people from flood-prone areas so that we can create and manage more public spaces for recreation."

The wide appeal of the soccer pitch reserves that space for public use and prevents it from being used for housing—an important matter in areas where residential structures, if built, are exposed to severe hazards. Such an approach could be used instead of more top-down (and possibly poorly enforced) government zoning restrictions in, for example, flood-prone areas. It would also hold some advantages over the types of strategies for preserving space recalled by older residents, which were ignored by or unclear to newcomers.

3) ***The Need to Adapt Sporting-Related Spaces to Climate Change***. The viability of the soccer pitch site that has now attracted so many stakeholders will depend on water management, which climate change will make more challenging. The site's sustainability—the ability to realize its primary use as a soccer pitch—will be threatened to the degree that flooding remains a risk. Thus while the site offers some measures for climate change adaptation (through space management), it must itself be adapted to the effects of climate change. Flooding has so far been addressed by digging a small drainage channel around the pitch, but some of the projects attached to the site face difficulties during heavy rains, which could grow worse under climate change. Members of one of the surrounding community gardens, for instance, complained of flooding wiping out their work.

Such projects could be designed from the outset to include climate change adaptation measures. Adding in the dimension of climate change adaptation could act as a selling point for potential donors and could even make the project eligible for additional sources of support.

Understood as a means of reducing vulnerability to climate change, *adaptation* goes beyond just building physical infrastructure. It recognizes that vulnerability to climate change has social, economic, political—and not only physical—sources. At the same time that a larger project like the one the soccer pitch has anchored might help to give some physical protection from effects of climate change through space management, it could also increase community resilience and adaptive capacity by providing more livelihood options, which appears to be underway in KI's soccer pitch.

4) ***Sports and Environmental Messages***. In addition to the above, we can identify some other inroads that sports can potentially make into communicating messages about water management and climate change. Following Kenya's post-election violence, which erupted along ethnic lines, KI organized a soccer tournament to address potential ethnic tensions within Kibera. Each village was asked to enter one team into the tournament, but with one important catch: each team had to be multi-ethnic. The tournament was part of a cultural week in Kibera where people discussed cultural ways of resolving violence.

Similar to how that tournament was held under the theme of addressing post-election violence, KI suggests that future tournaments could be held under themes that discuss

environmental issues including water management or climate change. This could open channels of discussing climate change with the broader community in a way that is relevant to their lives.

KI has also managed to find opportunities for discussing climate change with youth on their annual climb up Mount Kilimanjaro. The theme of the 2009 climb was "Climbing to Combat Climate Change" and the 2010 theme was "Green Economy and Sustainable Development."

Further Research

1) KI has suggested a strategy to manage building space through sports fields. Further research could look into whether, how, and under which conditions such a strategy could be used for climate change adaptation. There is an important matter to be resolved, however. While building sports fields can prevent people from building houses in hazardous areas, such a strategy does not, of course, provide them with the shelter they require. It would need to be complemented by good housing programs to offer a more complete response.

2) Similarly, KI has found a strategy to create vibrant and safe public spaces that attract community stakeholders and works as a community revitalization project. With the soccer pitch, the potential prospects for climate change adaptation (through space management) were realized afterwards. What would be different in the future would be to deliberately design and incorporate elements that advance adaptation into such a project much earlier in the planning process. Those elements would be different in each project, but the participatory decision-making model observed in the soccer pitch project showed how a community could potentially plan adaptation into their projects.

3) The success of adaptation in areas at risk of experiencing extreme climate change-related events will hinge on how the community perceives the need to adapt. The use of sports to get across important messages offers a means of publicly discussing environmental concerns. KI has not yet organized a soccer tournament under the theme of the environment, but if it does it would be extremely value to research what environmental messages circulate through the community as a result and what kind of interest this would generate in adaptation.

Kenya Debt Relief Network (KENDREN)

The Kenya Debt Relief Network (KENDREN) is a network of originated to carry forward in Kenya the Jubilee 2000 campaign of international debt cancellation.

Debt and Water

The main effect of debt has been to constrain the range of programs that governments can fund, programs that have significant implications for people's wellbeing. Underfunding therefore leads to political struggle as people organize to pressure government to direct some of that limited funding towards the programs they feel are most important. In the case of health and education, workers can use industrial forms of mass action like strikes to make their demands. In the case of water, however, the struggle takes on different forms.

This is because unlike health or education services, which are mainly distributed as a transfer of expertise and care, and cannot therefore be physically captured, water service is different. Water is physical and has a physical infrastructure used to source and distribute it. That infrastructure can be tapped into, and the water collected, packaged, and sold. What KENDREN has realized is that this property of water—its *tangibility*—lends itself to easy commodification. But what model of commodification is used makes a great deal of difference

Water is not just tangible, but necessary. Water makes life possible in multiple ways. It is, of course, necessary for drinking, cooking, and cleaning. But it can also generate economic revenues, as our team witnessed in carwash services in Silanga. The absolute necessity of water as both a physical and economic need means that denying it, whether deliberately or through poor service provision, will lead people to acquire it by whatever means possible.

Contributions to Knowledge

As noted in the introduction of this report, collaboration between organizations involved in separate and very different activities can bring unexpected benefits and discoveries. We experienced such a moment during our team meeting in Nairobi. Drawing on the work of KENDREN as well as observations made following field visits to the informal settlements of Silanga, Kibera and Mathare, Huruma (the latter organized by KENDREN), the team discussed two general models of water commodification—models that will need to be better understood as the effects of climate change make water access more difficult.

In the first model, seen in Kibera, the tangibility of water and its transportation infrastructure allowed people to tap extra-legally into water pipelines where and when services became unreliable. Some of the water tapping efforts eventually became organized (we did not get a chance to look into the processes behind this) and in some instances formed into water cartels that now sell water for profit. A power struggle now exists as communal forms of providing water more affordably are blocked by the cartels

who seek to keep the price high. This is a different model of water commodification than what was fought against in the water wars of Cochabamba, Bolivia where a major foreign private company would have gained control of the city's water.

KENDREN organized a field visit hosted by community groups to Mathare, Huruma, who showed our team an alternative model of water commodification. The team was shown how water is captured in storage tanks by community organizations and sold to users. However, the money is not taken as profits but instead goes back into the community. There was a diversity of projects supported under this model including a car wash and a community garden.

Further Research

This second model of commodification will need further study as there are some important questions to consider, particularly if climate change should exacerbate water problems at the same time that debt constrains countries' ability to provide water services:

- How widespread is this second model of community-based water commodification? And how well does it serve community water needs? If the community is disaggregated by age, ethnicity, income, etc., are all groups served equally well?
- Does the second model exist alongside other models of water distribution/commodification? If so, how do users decide between them when acquiring water?
- Does laying the groundwork of the second model make it susceptible to takeover by cartels or to itself becoming a cartel? What signs would indicate that a community-based water commodification model was transforming into a cartel-style model?
- Alternatively, does this model protect against the cartel-style approach? How do actors involved in this second model preserve it against actors seeking to transform it into the first?
- The second model offers water services where they are unavailable. It is a laudable example of an autonomous, community-based response to government failure to provide a necessary service. But does it disrupt or delay mobilization to compel the government to distribute water? Alternatively, does it offer a community-based system of water distribution that people can rally around, one the government ought to support in order to reach marginalized groups?
- What other essential goods are easy to commodify? Under which models have they been commodified?

KENDREN's activities provided a window into a window into climate change. Through the window of debt we look into the window of water management and see 1) why the ability of governments to provide water services to its most marginalized populations becomes constrained and 2) how autonomous measures are taken in response to distribute

water through different models of commodification. Through these windows we can then look onto climate change and make some predictions.

One tentative prediction we can make is that in places where debt has led to poor government service provision and where climate change reduces water availability, the need will grow for people to take autonomous, and sometimes extra-legal, measures to acquire and distribute necessities. When it comes to water, models like the ones our team was shown may become increasingly common in countries where debt is severely constraining government ability to provide free or affordable water services and where climate change has reduced water availability.

People's autonomous reactions to water shortages are a second-order effect of climate change, not readily predictable from climatological models. The cartel model is clearly undesirable: its profit motive forces already poor groups to pay a high price for a resource necessary for life and economic wellbeing. The model's logic is such that it may price water beyond the reach of the very poorest and will actively disrupt autonomous attempts to cultivate more affordable alternatives, as our team was told has been occurring in Kibera. The second model is more laudable, but there remain some questions. While the model fills a gap in service provision, how well does it serve community water needs? Does it risk turning into the cartel model or delaying organized mobilization to wrest service provision from government? Or does it do the opposite and present a positive example of community solidarity, an accomplishment that can serve to rally community members around—and even one that state support can make even more effective?

University of Nairobi

Contributions to Knowledge

Tripartite Relationship. Faculty members from the University of Nairobi's Urban and Regional planning department found the tripartite relationship between the University of Nairobi, civil society organizations, and communities in Kibera to be a very powerful building block in conducting practical research. It built relationships of trust that allowed academics from the University to work closely with communities while protecting against the common problem of academics "mining" data from communities and returning little to them. The results of the research will be shared back with the members of the community in order to help empower community-based organizations to take practical action in improving their livelihoods. This model showed promise for wider adoption where community organizations realize the need to undertake climate change adaptation.

The tripartite relationship was particularly useful for the Urban Studio projects that several Masters students in the Department of Urban and Regional Planning completed as part of their graduate work. The team was shown a very rich and in-depth study on a number of issues facing Kibera—including water—in the context of slum-upgrading projects. (In recognition that the project work belonged to a student and was still being finalized at the time of writing, this report does not discuss the findings of that particular project.)

Kenya's Water Governance Structure. The work of Stephen Otieno an MA student at the University of Nairobi showed that Kenya is a water-scarce country not simply because of supply, but also because of poor governance. Kenya's water governance structure under the 2002 Water Act remains very top-down and, as a result, unresponsive to water needs in informal settlements, where most of Nairobi lives. The poor service provision has several important consequences. First, it reduces the legitimacy of the state. Second, it forces people to take autonomous measures to acquire water. Autonomous measures like extra-legal tapping of water infrastructure are often done without the proper equipment, leading to water wastage. And water wastage goes beyond the informal settlements. Otieno points to a World Bank report stating that Nairobi cannot account for a staggering 40-60% of the water it pumps. Nairobi is now talking about diverting water from other rivers to meet growing needs. But the poor accounting suggests there is considerable wastage. If existing water sources were used more efficiently, it would reduce the need to exploit new sources. Should climate change reduce the amount of water reaching Nairobi, ongoing wastage could unnecessarily expose people to water scarcity. Adapting Nairobi's water distribution to climate change can begin now by solving existing governance and wastage issues.

Churches, youth groups, non-government organizations, and other civil society organizations have moved into the gap left by the state and organize community water points that provide cheap water and reduces the distance people need to travel to acquire

it. Otieno identifies a potential synergy between groups like these and small companies on the one hand and the state on the other in water provision. The former can develop distribution systems that reach people in informal settlements that existing water infrastructure fails to reach. The state, for its part, can ensure that community water management systems have the resources needed to work over the long term. But for this synergy to be realized there needs to be a devolution in the structure of water governance in Kenya.

Further Research

Devolution. Recognizing the need for devolution opens up questions for further research on how it should proceed. What models of devolution would be most effective in order to realize the synergy between government and civil society organizations? What actions are needed to put them in place?

Scope and Follow-Up. There are limitations to what informal settlements can do to address water-management issues in the face of climate change. A future direction for research is to look to the level of the watershed or the "water towers" (the heavily forested mountains that serve as the source of most of Kenya's freshwater) and understand how communities might exercise their right to water through the governance structures that exist at these levels.

At the same time, it will be important to understand whether there is sustained interest among civil society organizations to work on climate change adaptation. How will adaptation strategies grow and change? Who will be driving them?

Coping versus Adaptation. One important distinction will need more clarification. When people react to flooding events like those that will become more frequent or severe under climate change, what kinds of reactions are these? Are they better classified as *coping* or *adapting*? The difference is important. *Coping* refers to the use of means and strategies to survive adverse conditions and restore basic functioning in the short term. Its focus is on the moment. *Adaptation* describes a process of reinvention and learning with focus on the future. Surviving is not in question to the same degree. Successful adaptation in anticipation of climatic events expands a community's coping range (i.e., its "capacity to reactively accommodate variations in climatic conditions and their impacts") and reduces the need for the degree of coping required to survive future events (IPCC, 2012: 33, 36, 50-52). When and under what conditions does coping lead to adaptation and when does it not? Who is driving the adaptation?