

CLIMATE CHANGE AND ADAPTATION MEASURES

Equity and gender inclusiveness - capacity imperatives, opportunities and lessons

From the African Community of Practice on Managing for Development Results at the African Capacity Building Foundation



Brief
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SYNOPSIS

The purpose of this online discussion was to explore the climate change and adaptation measures in Africa. The specific focus was to identify issues of equity and gender inclusiveness, capacity imperatives, opportunities and lessons. While the online discussion did not generate extensive traffic, the few contributors substantiated the observation that Africa, given its social, economic, political, and geographical diversity, is highly vulnerable to climate change impacts. Climate change will result in changes in weather patterns, water supply and quality, and also impact negatively agriculture, human health, human settlement, and ecosystems. These impacts are more severe on women than men. Given the poor performance of most African economies and the high cost of mitigation measures, most African countries will not be able to invest in climate mitigation strategies. However, there is commendable progress as various governments have already developed Climate Adaptation Strategies in order to address the local, regional and national impacts of climate change. It is imperative to note that while such policy documents are cognizant of the gendered impacts of climate change; implementing gender sensitive climate adaptation programs will be costly. The main lessons for Africa include the need to strengthen regional coordination in dealing with climate change impacts and upscaling adaptation measures to enhance the resilience of local community.

Introduction

Africa is most vulnerable to climate change impacts compared to other continents. The impacts of climate change are context specific but it is broadly the predicted, these changes will impact ecosystems (biodiversity and habitats), human systems (agriculture, health, and water), urban systems (transport and infrastructure), economic systems (energy, natural capital), and social systems (equity, peace and conflict) (IPCC 2014). The Intergovernmental Panel on Climate Change (IPCC) (2007) reported that Africa is most likely to experience hot temperatures and severe drought conditions in the Sahel region, Horn of Africa, and Southern Africa (Pachauri et al. 2008). In addition, it also predicted that Africa will experience increased

water stress by 2020 (affecting between 75-250 million people), a 50 % decline in rain fed agriculture by 2020, projected sea level rise that will affect low-lying coastal areas with large populations, and a 5-8% increase of arid and semi-arid lands. Some of these predicted changes are already evident such as the deteriorating water supply and quality in West Africa, the melting snows of Mt Kilimanjaro, below average rainfall resulting in food shortages and livestock death in Kenya and Somalia (2010/2012), and severe flooding that is impacting on human shelter

That “climate change impacts will be differently distributed among different regions, generations, age classes, income groups, occupations and genders” (Smithson 2002) is common knowledge. Focusing on the gendered impact of climate change,

research indicates that women are more at risk to climate change than men. Some research work in the Limpopo province, South Africa shows men tend to rely on wage incomes while women depend on multiple income streams, most of which are sensitive to harsh climate conditions. Thus, livelihood portfolios for women are affected by the availability of water and natural resources. Also, the predicted disease patterns will affect women more compared to men.

In order to cope with the impacts of climate change, countries need to invest in adaptation strategies. Adaptation to climate change is defined as including a set of complimentary activities undertaken by the state, non-state actors and individuals. Adaptation mechanisms cost money and Africa for example is required to invest about 0.8-4.6 billion US dollars per year for low cost adaptation measures until 2030 while an upwards of USD 50-100 billion may be required per year for infrastructure projects (Shardul & Samuel 2008). Africa has sustained economic growth over the past 15 years but as the Africa Competitiveness Report (2015) notes, “Africa’s growth path could be more equitable and broad based” suggesting also the need for inclusive growth that benefits more people. Given the predicted changes and the high poverty rates on the continent, investments in climate adaptation need to be (gender) inclusive and equitable.

One of the future concerns is the ability of the African continent to feed its people in the face of harsh climatic changes. Maize is an important staple and its production is likely to decline by the year 2055 resulting in direct negative impacts at the household level (Jones & Thornton 2003). Poor and rural households are mostly dependent on mixed crop and livestock agriculture which is largely less mechanized agriculture (i.e. hand tillage with no access to irrigation (A. Brown 2015; Busby et al. 2014). Such farming systems are highly sensitive to climate change, particularly hot and dry conditions, which will affect household productivity and also lead to increased cost of cereals (Kurukulasuriya & Mendelsohn 2008)

In order to explore these multifaceted impacts of climate change on the African continent and the adaptation mechanisms, AfCoP launched an online discussion that was guided by the following questions:

1. What are the projected impacts of climate change in your region?
2. Are there any community level impacts that are predicted for your locality? If yes, what are they?
3. How do these impacts affect both men and women?
4. What are your country level adaptation measures?
5. How well do they reflect the differential impacts of climate change on men and women?
6. As a continent, what concrete steps can we take to mitigate the gendered impacts of climate change?

The following section presents the viewpoints raised during the discussion and secondary literature review. There were two contributors to this discussion (Gemma Mbaya and Risper Buyaki Nyairo) who both gave examples from Kenya. Their perspectives are also shared in the following section.

Definition of key terms

Climate change adaptation - The UN Development Program calls it a process by which strategies to moderate, cope with and take advantage of the consequences of climatic events are enhanced, developed, and implemented.

Climate Change - refers to any long-term change in Earth's climate, or in the climate of a region or city. This includes warming, cooling and changes besides temperature.

Projected Impacts of Climate Change in Africa

This section focuses on three main projected impacts of climate change: impact on ecosystems, impact on food systems and impacts on human health.

Ecosystem impacts

Climate change will result in reduced water availability and increased land degradation. The IPCC report of 2007, notes that some regions in East Africa have become drier, due to changes in land use pattern and climate. The report further estimates that by 2020, approximately 75-250 million people will be exposed to increased water stress due to climate change. Ecosystem impacts further include impact on mountain biodiversity and declines in fisheries in some major lakes. For example, Potts et al (2005:33) estimated that populations of West African living in coastal settlement could be affected by projected rise in sea level and floods. Therefore, changes in coastal environment, for example, mangroves and coastal degradation could have negative impacts on fisheries and tourism. More so changes in ecosystem have also significant impact on wild sources of food and natural habitats. Gameda and Sima (2015) found that increased carbon dioxide level in the atmosphere is causing acidification in oceans and this is a threat to marine life.

Human Systems

Human systems include agriculture, human health, water, urban systems, economic systems, economic systems, and social system. Each is discussed in brief below.

Agriculture

Human systems refer to aspects of agriculture (food supply) and human health that will be impacted by climate change. One of the anticipated impacts of climate change is that dry areas will become drier. These drier conditions will affect countries with highest yield averages and also affect fertilized modern seed varieties (Schlenker & Lobell 2010). South Asia and Southern Africa are the two regions that are prone to negative impacts on several crops (Lobell et al. 2008). As Gemma Mbaya noted during the online discussion, 80% of Kenya's land is classified as arid and any additional decline in rainfall or an increase in drier conditions will make it difficult to produce crops and consequently feed millions of people. Projected reductions in yield in some

countries were estimated to be as much as 50% by 2020, and crop net revenues to fall by as much as 90% by 2100, with small-scale farmers being the most affected. This would adversely affect food security in the continent. Thus, adequate mitigation is required in order to avert potential food shortages on the continent. The proposed cocktail of measures includes the need to invest in large scale agricultural interventions. Others note however, that small scale farmers in Africa have been resilient and adapted to historical changes. What is required therefore is for governments to provide adequate and relevant information to farmers (Challinor et al. 2007).

Human health

Africa will experience both the direct and indirect health impacts as a result of the predicted changes in rainfall and temperature. The direct health impacts include high disease prevalence, eye diseases, skin cancers and cardio-respiratory diseases. On the other hand, indirect impacts will include water-borne diseases, malnutrition and potential conflicts. The United Nations Framework Convention on Climate Change further postulates there will be an increase in the incidence of neglected tropical diseases, diarrhea, malaria, dengue fever, and meningitis. IPCC 2007 Report projected that previously malaria-free highlands areas in Ethiopia, Kenya, Rwanda and Burundi could also experience incidences of malaria by 2050s with the conditions for transmission becoming highly suitable by 2080s. The population of disease-carrying mosquitoes is expected to increase as a result of changes in temperature and precipitation, leading to increased malaria epidemics (Lindsay and Martens, 1998). Given the diversity of the continent, each sub-region is required to develop plans for dealing with these potential epidemics.

Water

Rainfall patterns will also shift in Africa with some areas becoming drier while others will be flooded. Countries such as Zambia have reported extreme dry periods. Traditional dry areas in Nigeria were also flooded and with it riverine crops and towns were flooded. Floods across Africa are reported to be the

worst in decades in some places and extend in an arc from Mauritania in the west to Kenya in the east. At least an estimated 1.5 million people are so far affected (World Food Programme, WFP 2007). According to the Cable Network News, CNN (2009), torrential rains and flooding affected 600,000 people in 16 West African nations. The worst hit has been Burkina Faso, Senegal, Ghana and Niger, where many lives and property have been lost to severe flooding events. The impacts of floods could also be far reaching - destroy communities and economies. Floods are also highly likely in Mauritania and most of Western Africa. More so, dry conditions are expected to affect land use and demand for ground water. The resultant shortages will greatly diminish water quality (surface and groundwater systems) (Urama & Ozor 2010).

Urban systems (transport and infrastructure)

Risper Buyaki Nyairo suggests during the discussion that climate change interventions need to focus on urban contexts as these are equally prone to negative climate impacts. The main impacts of climate change on urban areas, at least in the next few decades, are likely to be increased levels of risk from existing hazards. For poorer groups, some of the impacts are very direct – for instance, more frequent and more hazardous floods. Some are less direct – for instance, reduced availabilities of fresh water supplies for whole cities that reduce supplies available to poorer groups (or that increase prices). Some are indirect – for instance, as the impacts of climate change-related weather events increase food prices or damage poorer households' asset bases or disrupt their incomes. Therefore infrastructure for all areas is required (which should limit risks of flooding for the whole city area, not just for the wealthier areas) and land-use management (to limit or make more resilient settlements in high-risk areas), and quality of provision for disaster-preparedness (including warnings, measures taken to limit damage and, if needed, good provision to help people move to safer areas quickly).

Economic systems (energy, natural capital)

Climate change can affect many important sectors of the economy by influencing the supply of and demand for goods and services (WBGU 2008). Empirical evidence shows that there will be changes in the supply and demand of food commodities as a result of low yields resulting mainly from drought and flooding events. The changes will also affect the profitability of farming and the affordability of food. Economic impacts from curtailment of hydropower generation from Lake Kariba as a result of the 1991-1992 drought were estimated to be the loss of US\$101 million in GDP, US\$36 million in export earnings, and 3,000 jobs (Benson and Clay, 1998, cited in Manase, 2009:5). In Mozambique, floods in 2000 cost the economy US\$550 million, or 12 per cent of GDP (Grey and Saddoff, 2005, cited in Manase, 2009:8). Extreme flooding of 2000 is reported to have slowed Mozambique's annual economic growth rate from 8% to 2%. The poor are among those who suffer particularly from the effects of water stress due to their vulnerability and inability to adapt. An increase in surface temperature will affect the livelihoods of the 70 per cent of Africans who depend on rain-fed agriculture. This will lead to low productivity, low income, and a low standard of living, thus completing the vicious cycle of poverty. Where climate change brings with it an increase in the frequency of extreme weather events such as flooding and drought, the risk of damage to property and infrastructure also rises.

Social systems (equity, peace and conflict)

Drastic changes in climate will require that communities adapt or migrate in order to cope with the changes. Recent migratory trends and violent conflicts on the continent have been linked to climate change (Reuveny 2007; Brzoska & Frihlich 2015). For example, Ban Ki Moon the former UN Secretary General noted:

'Almost invariably, we discuss Darfur in convenient military and political shorthand -- an ethnic conflict pitting Arab militias against black rebels and farmers. Look to its roots, though, and you discover a more complex dynamic. Amid the diverse social and

political causes, the Darfur conflict began as an ecological crisis, arising at least in part from climate change.'

In semi-arid Africa, pastoralism is the main economic activity, with pastoral communities including transnational migrants in search of water and new seasonal grazing (Bates et al, 2008:15). In drought situations, such pastoralists may come into conflict with settled agrarian systems. With reduced runoff and drying up of rivers, communities are forced to trek long distances from their own communities to look for water. This has created pressures and tensions at the new water sources with resultant conflicts (in addition to other effects on livelihoods such as loss in person-hours). One such example is in Nigeria between the Fulani cattle bearers and the farming communities competing over grazing land and access to water bodies (Ozor, 2009), leading to the deaths of several farmers and pastoralists in the region. The effects of climate change are certain to displace some populations, with a significant increase in the number of environmental migrants over the coming decades. In many countries, the increase in flooding events, submergence, drought, soil degradation and growing water scarcity in combination with high population growth, unstable institutions, poverty or a high level of dependency on agriculture means that there is a particularly significant risk of environmental migration occurring and increasing in scale p19. People living in low-lying islands and delta regions face the threat of being submerged by water, hence the only coping strategy will be to move out of the risk sites to more habitable areas (ibid : 22). This movement will greatly affect such people in many ways, including loss of livelihoods, loss of social systems and values, loss of property and age-long acquired wealth, injuries and sometimes death. Research evidence shows however that the relationship between climate change and conflict is mediated by several factors but it is highly plausible that climate change can cause conflicts and also adaption projects could contribute to conflict on their own.

The Gendered Impacts of Climate Change

Most of rural Africa is highly dependent on primary ecosystem productivity and women mostly harvest the products such as wood, agricultural crops, wastes and forest resources for their energy and livelihoods. The climate change predictions indicate that there will be a decline in ecosystem goods and services and women will be impacted the most. The predicted and evident decline in biodiversity thus will reduce resilience, social relations, health, and freedom of choices and actions more for women than men. (Lambrou & Piana 2006). . Since, Africa women are highly dependent on biomass, such as wood, agricultural crops, wastes and forest resources for their energy and livelihoods. However, in the face of climate change, the ability of women to obtain these indispensable resources is reduced. The decline in biodiversity does not solely impact the material welfare and livelihoods of people; it also cripples access to security, resiliency, social relations, health, and freedom of choices and actions.

The consequences of flooding and drought will also impact human and economic systems. A study from Bangladesh (one of the most flood prone areas) indicates that floods affect rural women more than men. The impacts of flood include the loss to household wealth and economic well-being. Women and girls are also mostly affected by water scarcity as they are traditionally assigned the role of fetching water. Water from distant sources is rarely enough to meet the needs of the household and is often contaminated, such that women and girls also pay the heaviest price for poor sanitation. As an example; in cases where the arsenic contamination of groundwater is prominent, increased flood levels intensify the rate of exposure among rural people and other socio-economically disadvantaged groups. The resulting health problems include: lesions, the hardening of skin, dark spots on hands and feet, swollen limbs and the loss of feeling (Khondker 1996).

The predicted changes in temperature and precipitation will also affect the spread of diseases such as cholera, malaria, and dengue fever. Some potential climate change scenarios include: increased morbidity and mortality due to heat waves, floods, storms, fires and droughts. More so, the risk of contracting serious illnesses is aggravated by environmental hazards caused by climate change. In addition to the reference provided above of climate impacting women's health through water scarcity and water contamination, an abundance of evidence links the evolution and distribution of infectious diseases to climate and weather. This entails a greater incidence of infectious diseases such as cholera, malaria, and dengue fever, due to the extension of risk seasons and wider geographic distribution of disease vectors (Chan 2007:44).

Women empowerment would come in handy through using some of the sensitization strategies mentioned above (or others that have been proved to work). In summary Nyairo (online discussant) also notes that while there is a tendency to focus on males and females, there is need to also look at the differential impacts among women themselves for example between women in urban areas compared to women in rural areas.

Adaptation to Climate Change

Given these various challenges that Africa is facing and will face in the future, in this section we explore what strategies are in place for adapting to climate change. While there are various estimates for the cost of adaptation to climate change, conservative estimates suggest that developing countries may need to invest between \$280-500 billion dollars a year by the year 2050. Adaptation strategies thus need to recognize that local communities are inherently adaptive and respond to local shocks in unique ways (Adger et al. 2003). Accordingly, the Paris Agreement notes that there is potential financing gap -termed the "adaptation financing gap" which is the difference between the available funds and the available funds. The UNFCCC has requested developed countries to provide USD100

billion there is no guarantee that these funds will be availed

Given that global financing for climate change is uncertain, there is need for regional bodies and national government to step up in ensure they build resilient societies. Some of the African governments have developed national strategies to combat climate change impacts. Kenya for example started developing its climate change response strategy in 2010 and its National Climate Change Action Plan (2013-2017). In addition, the national level strategies, the African Union also put together its Climate Change Strategy, the CCAP (2011-2015) developed by the Africa Development Bank, and the Africa Climate Change Policy (FAO). AU's strategy focuses issues of genders and climate change, financing and implementation, and climate resilient development.

Regarding Coastal zones, proposed adaptation measures include fisheries management for example in Seychelles the closed seasons control agreements with foreign fleets and establishment of marine reserves. In West Africa, measures include the development of a Sustainable Fisheries Livelihoods Programme. Dykes and protective measurements are proposed for the Nile Delta in Egypt, as they would probably prevent the worst flooding up to a 50 cm sea level rise. However, it is expected that they may cause serious groundwater siltation and aggravate the impact on increasing wave action (UNEP, 2004). Adaptation measures for heat waves include heat resistant cultivars; crop management shorter season or early maturing crops, shifting time or location, change type of crop, shading crops and animals, increase irrigation and early warning and forecast systems

Huq and Reid, (2005) highlighted the importance of linking research to policy-making, with an emphasis on getting research messages to appropriate target groups; linking research to existing local knowledge of climate related hazards and involving local communities in adaptation decision making p102. Ibid, further discuss the need for effective communication between the supply-side and

demand-side communities of climate information in Africa and the need to work on means by which climate information can be incorporated into the livelihood strategies of potential users. Better forecasting and early warning systems have been identified as a prerequisite for adaptation, particularly to predict and prevent the effects of floods, droughts and tropical cyclones as well as for indicating the planting dates to coincide with the beginning of the rainy season and predicting whether there will be disease outbreaks in areas that are prone to epidemics.

Way forward for Africa (Lessons from Other Continents)

Some of suggested approaches include communicating effectively the impacts of climate change through dramas and scaling up events such as the environment days in order to create environmental awareness at the farmer level. As far as greenhouse-gas emission is considered as an impact for climate change, it is recommended to switch to renewable sources of energy and using fossil fuels more efficiently; slowing the rate of deforestation; adopting more efficient agricultural practices and transforming consumption patterns in industrialized and rapidly-industrializing countries.

The second strategy is to empower women and to also develop adaptation strategies for the urban areas -as they are expanding fast with little to no planning. The Africa Union (AU) notes that the condition of women and children can be aggravated by effects of climate change. There is need therefore to understand the linkages between gender and climate change and this will be achieved through the Gender Action Plan. Considering that women constitute about 70% of those living below the poverty line, AU's Draft Strategy on Climate Change recommends the inclusion and prioritization of women's views in developing adaptation strategies.

The third suggestion also comes from Gemma Mbaya who proposes a coordinated approach to climate change issues and vesting decision making in the "highest office" to enhance accountability and

making sure that decisions are made thereby minimizing climate change impacts.

The fourth recommendation is for AfCoP to establish a Regional CoP for Climate Change. The purpose of such a platform is to allow for regional synthesis of climate change impacts and share ideas on appropriate and cost-effective mitigation strategies.

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