



Young Scientists' Perspectives on "Climate Change Adaptation and Resilience in Africa, Recommendations to Policy Makers"

By Christopher Oluwakunmi Akinbile, Adejoke Olukemi Akinyele, Shaheen Motala-Timol, and Mamuye Busier Yesuf

Introduction: Science and knowledge are critically important to enable society to understand and respond to threats posed by climate change. According to expert consensus, climate change is a reality facing a number of vulnerable societies across the globe. For instance, anthropogenic greenhouse gas emissions have increased since pre-industrial era driven largely by economic and population growth. From 2000 and 2010, emissions were the highest in global history and a 40C world increase in average surface temperatures by the end of the century remains a real risk.

Africa, a highly diverse continent with distinguishing diversities, histories, climates and environments is particularly sensitive to and facing the consequences of the impacts of climate change due to the level of existing vulnerabilities even though it has little contribution to greenhouse gas (GHG) emissions. Africa's climate change will depend largely on the environmental and socio-economic set-up of different sub-regions. For example, central and eastern Africa will experience major impacts that will be driven by changes in seasonal rainfall, extreme rainfall and drought events while large parts of western, northern and southern Africa will likely experience significant reductions in overall rainfall amounts, becoming hotter and drier. Due to these alarming projections, the network of African Science Academies (NASAC) decided to produce a policy booklet to capture the integrated expert voice to guide required processes that will enhance effective national, trans-boundary and continent-wide policy responses in adapting to climate change in Africa. A review of this policy brief was carried out from the perspectives of young scientists from five major drivers viz: water, agriculture and food security, fisheries and food security, coastal and urban zones as well as human health. A critical review of key recommendations made by senior experts for Africa policy makers were also holistically appraised from the young scientists' perspectives.

Young scientists' views of the sectoral impacts and adaptation options considered in the climate change report:

The views of the team of young scientists assembled to consider the report were expressed as follows on each of the key sectoral impacts:

A.) Adaptation options to water

All the recommendations under this sector were strongly supported and in addition, effective development of surface and groundwater sources which will mitigate drought and desertification in countries where such exist especially in the northern and western part of West Africa should also be encouraged. This will slow down erosion development in cases of excess run-off and desertification in cases of deficit or inadequate rainfall.

Similarly, treatment of wastewater before discharging into the water bodies or recycling is also to be included in the policy brief report. This will largely reduce the damaging consequences of discharging untreated wastewater (UWW) on oceans and aquatic lives and minimise deterioration of coastal habitat. In the same vein, the beneficial effect of using treated wastewater (TWW) on agriculture especially irrigation for food security and self-sufficiency will be enhanced.

Less dependence on hydropower is also an issue to be considered in policy formulation for climate change resilience in Africa. The need to develop alternate sources of power such as solar, which is clean, cheap and renewable, should be given strong consideration. A report has it that the intensity of sunshine generated in Northern Africa alone is enough to 'light up' the entire African continent. Wind energy is another very good source of energy if very good study is conducted on the migration and directional movement of winds, as it is being used in Netherlands. Another report opined that erection of dams across rivers distort the ecosystems of such rivers thereby making it an unpopular choice for power generation.

Similarly, African governments should focus on infrastructure on hydro climatic monitoring. Establishment of meteorological stations, gauging station on the rivers and sediment transport measurement devices should be used for determination of the amount of sediment transported in the river.

Watershed/catchment management is very important in decreasing nutrients movement, increase infiltration of water to feed ground water reservoir and addition flow as subsurface flow for the rivers.

The concept of water consumption should get emphasis because when we have dams for different purposes (Power generation, water supply, and irrigation, recreational...) the surface area of water exposed to the atmosphere is increased and the amount of water lost by evaporation is high. Therefore, it is possible to consider the value of water on the energy selling (tariff) and back to use the finance for watershed management in the area.

Item 5 which talks about 'improve communication on research on water issues...' should be modified to reflect localised information dissemination in order to make research findings on water accessible to end-users in their most comprehensible language or

format. This will make dissemination highly effective and adaptation strategies impactful.

B.) Adaptation options to agriculture and food security

Slight modifications to items 2 and 3 were suggested. Rather than suggesting provisions of mere livestock insurance options, a holistic approach to the entire agricultural sector should be encouraged. In other words, agricultural insurance should be promoted. For item 3, rather than promoting 'shift from purely subsistence practices towards selling of goods.....' creation of market value-chain from agricultural products should be advocated. This means making a business out of agricultural produce in order to provide capital reserves for survival during bad season which means that agropreneurship is advocated.

Promotion of establishment of indigenous species and drought resistant crops: More emphasis should be placed on production of indigenous species that are already well established in their places of origin as against exotic species which in most cases are location-specific. Planting of indigenous species that are resistant to drought or could adapt to different climatic regions should be encouraged. Such species could be discovered through funding of research on plant species that could adapt to different climatic regions. This will slow down desertification advancement, act as wind breakers and promote development of vegetation in areas already lost to desert encroachment. A collective effort to restore the lost forest of Africa through vigorous reforestation should be promoted and encouraged.

All other points under these adaptation options are hereby strongly supported.

C.) Adaptation options for fisheries and food security

Point 4 which talks about extension services need to be enhanced. Guidelines for farmers' policies should encourage and support extension services, establish quality control and feedback mechanisms. This can only be effective with functional and workable policies in place as well as monitoring agencies for implementation. This should be captured under this point. Apart from this, all other points and major highlights under this section are strongly supported.

D.) Adaptation options for coastal and urban zones

All the 4 points are strongly supported. No further addition from the young scientists' perspectives.

E.) Adaptation options for human health

A slight modification to adaptation options is hereby presented. In addition to commissioning of medical research into existing and potential diseases due to climate change, provision of mobile clinics to reach villages and settlements without health centres to take care of climate change effects or that have been displaced due to vulnerability of such settlements is important.

Improvement of hygiene which will go a very long way in ameliorating the outbreak of sicknesses and diseases occasioned by climate change within such localities should be encouraged.

Similarly, the need to demystify myth surrounding sicknesses and diseases is encouraged. A considerable number of Africans believe that some sicknesses and diseases have spiritual connotations. There is need to demystify myth surrounding such. People should be encouraged to seek early medical attention.

Finally, the importance of health insurance which is unpopular in Africa should be stressed. This will reduce mortality rates occasioned by lack of access to health care due to low or no income considerably, especially for the most vulnerable group of women, children and the extremely poor people.

Key recommendations for African policy makers for sustainable development in the context of climate change

All the 7 key recommendations for consideration by African policy makers in their quest for sustainable development in the context of climate change in Africa are fully embraced and strongly supported. The recommendations are informed, precautionary policy making, integrated responses: from local to international, climate research, civic engagement and education, technologies for adaptation, economic diversification and financing climate change adaptation are spot on and key to the adaptation and resilience within the context of African climate change. Under informed, precautionary policy making, there is a need to have access to sound data and to identify the areas and population at risks. Modelling and planning tools are required to analyse these data of environmental trends and risk analysis. Training of local people in this capacity is also required.

Under integrated responses, climate change adaptation strategies must not only be locally specific but also location specific. This is because the strategies definitely will vary from location to location even within the same locality. This should be factored in when designing the adaptation strategies. Similarly, on the recommendation of climate research (recommendation 3), its (i.e. current research) inability to respond to national knowledge gaps was due to the interests of the donor agencies, most of whom are not based in Africa, hence do not essentially have Africa's interests in mind. The climate research studies funded will always have direct bearing in solving their own climate challenges rather than Africa's challenges. Hence, scientists embark on foreign-led studies. Collaborative climate change research across regions and countries in Africa

should be promoted. Priority fields of studies (doctoral and postdoctoral programmes) should include climate change. Interdisciplinary research is to be encouraged as climate change cuts across different fields of research. There is a striking similarity between this and recommendation 7 (financing climate change adaptation), which again could be traced to the reckless nature of African governments and a lack of sufficient interest in fighting climate change effects in Africa.

For civic education and engagement, African governments can empower youth to develop entrepreneurship initiatives that build on climate change and opportunities it presents such as 'green' or 'blue' economy ventures, which are enterprises that promote environmental conservation and nature protection, and are low-carbon initiatives.

Capacity building should be done in collaboration with local communities. One example is the promotion of local medicinal plants - this helps to conserve the biodiversity, and people are thus also less reliant on chemicals. Governments can have special funding schemes for these low-carbon, youth-led and climate resilient ventures.

Apart from these four observations, the recommendations are excellent and thinking of the producers is in line with the young perspectives opinion on how to tackle climate change phenomena in Africa. If these recommendations are embraced by African policy makers, incorporated into policy blueprint of African governments, then Africa will be ready to combat the effects of climate change.

Conclusion: There is no better time to start implementing these recommendations than now if Africa and indeed Africans are serious and ready to tackle the menace of climate change headlong and to put in place adaptation strategies and resilience required to build a strong adaptive capacity for effective and sustainable response. Acknowledgments and appreciation.

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