



Seventh Framework Programme

Theme 6

Environment



Project: 603864 – HELIX

Full project title:

High-End cLimate Impacts and eXtremes

Deliverable: 8.6

Policy brief summarising assessment of impacts of climate change in Northern Hemisphere Sub-Saharan Africa, including uncertainties

Version 1.0



Original Due date of deliverable: 31/10/2017

Actual delivery date: 31/10/2017

**Policy brief summarising
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**OCTOBER
2017**

Section one

Water Resources for Sustainable Development across Sub-Sahara Africa

Section two

**Sustainable Agriculture in Northern Hemisphere Sub-Sahara Africa under
increased Climate Warming**

Disclaimer

The recommendations and opinions in this report are those of the individual authors and do not necessarily represent the views of the European Commission or other partners the HELIX project.

Project
603864

Section one: Water Resources for Sustainable Development across Sub-Saharan Africa

Introduction

Increased climate warming and the current climate extremes afflicting societies in parts of Northern Hemisphere Sub-Saharan Africa (NHSSA) have strong linkage with water. Disasters which are hydrometeorological in nature are a serious threat to sustainable development and livelihoods in the region. The Sahel and West Africa areas are prone to frequent flooding disasters, too much surface water after torrential seasonal rainfall which occurs for only 3 to 4 months during the year followed by 6 to 9 months of dry conditions with no water. In East Africa sub-region, even though flooding is a problem in few areas, is stressed by frequent droughts and famine due to wide scale failure of rainfed agriculture and depletion of surface natural water resources. Thus water related extremes affect West and East Africa sub-regions of NHSSA differently, but the approach of controlling and reducing flood risk, storing runoff in expanded reservoirs has many socio-economic benefits to societies across the region.

The Specific warming level projections have indicated that runoff will increase moderately across NHSSA, with strongest model agreement for East Africa Sub-Region. Over East Africa, runoff could increase by up to 25% upon attainment of 2°C global warming, but there is large uncertainty in this. This could happen before the middle of this century if the current global warming trend continues. Even if the recent international climate treaty initiatives like the Paris Agreement to contain global warming to 1.5°C are considered, the occurrence of hydrometeorological disasters afflicting NHSSA cannot be expected to ease during the next decade unless there is large scale intervention. Flooding over the Sahel and West Africa is projected to continue with increased magnitude and therefore adverse impacts. East Africa is already a region where droughts and water scarcity are a huge threat to sustainable development. Therefore flood risk control and adaptation measures in both East and West Africa will have a common societal benefit, namely upscaling of surface runoff water storage, construction of high capacity reservoirs for controlled water use.

Guiding Principles: Flood Risk and Runoff Control to the benefit of NHSSA livelihoods informed by SWLs Implications

It is only surface water availability and controlled use which can conserve and restore ecosystems productivity across NHSSA. Large scale surface water harvesting alongside technologies which conserve and extend soil moisture, especially the arid-and and semi-arid lands (ASALS) guarantees good productive environment. Most NHSSA has serious water scarcity, yet too much runoff water disappears into oceans adjacent Africa and rivers where there are no reservoirs. This is the situation which should be urgently addressed if NHSSA is to benefit from its runoff, ensure water security and availability for controlled use. It requires commitment of resources and expertise.

What should be done for to Improve Surface Water Availability

The strategic decisions which will ensure reduction of flood risk; reducing hydrometeorological disasters and turning runoff into resource of fresh water availability, and for irrigated agriculture urges that Sub-Sahara Africa water resources development policies and programmes undertake the following:

- ✓ Increase and upscale flood control by construction of high-capacity reservoirs, especially catchment basins in the ASALs with in-build energy free distribution designs to minimize costs of the water accessibility and use
- ✓ Implementation of controlled reservoir water use for large scale irrigated agriculture and food production activities
- ✓ Implement technologies which use surface water and runoff to conserve and restore ecosystem and bio-diversity as the resource base for sustainable development.

These strategies on addressing water challenges in NHSSA are strongly recommended to be pillars in the international, regional and national adaptation plans. Scientific cooperation in addressing the water issues for sustainable development is critical. Runoff, river systems and other surface water bodies like some lakes are trans-boundary in nature and requires collaboration between nations and development partners. Implementation of these strategies should form some of the major pillars of future technical cooperation between



the European Union (EU) and Sub-Sahara economic blocks like the Inter-Governmental Authority on Development (IGAD).

Section two: Sustainable Agriculture in Northern Hemisphere Sub-Sahara Africa under increased Climate Warming

Introduction

Increased climate warming and the current food shortages affecting many parts of Northern Hemisphere Sub-Sahara Africa is a great stress to national, regional and international community. Frequent food shortages induced by crop failure due to recurrent droughts in East Africa are should awaken strategic decisions to shift agriculture from rainfed to irrigated. Carefully controlled and management of crop varieties most suitable for various areas, especially the arid and semi-arid lands in Sub-Sahara Africa should be sort and adopted with highest priority.

The Specific warming level impacts have shown that during the decade 2020s, temperatures are projected to be within the 1.5°C to 2°C specific warming level. At this level of climate warming, adverse and negative biophysical impacts include loss of bio-diversity, reduced ecosystems productivity, and species loss in the region as a whole. Stable food crops of Africa like maize yields are projected to fall by more than 50% nearly. Bigger reductions are projected to occur if higher Specific warming level 4°C is attained. These adverse implications when considered against current food shortages across Sub-Sahara Africa, increasing population and urbanization in the high potential areas, and decreasing land which hinders enhanced food production implies there is an urgent problem which should be addressed to ensure food security for current and future generations.

Guiding Principles for Sustainable Agriculture and Food Productivity in NHSSA Under SWLs

There should be a consorted effort to make optimal/ better use of marginal climatic conditions, including using low rainfall in marginal areas. Shift in crop varieties to drought resistant crops

for Arid and Semi-Arid Lands, faster maturing breeds, and shift in agricultural practices and technologies to ensure production of certain crops in specific areas depending on agro-climatological zones is necessary. Conservation agricultural practices and approaches therein to increase productivity are strongly recommended.

Shift from rainfed to irrigated and controlled cropping conditions has the potential to increase substantially the yields of a wide range of crops in many parts of Sub-Sahara Africa which are arid-and semi-arid lands. This can be done provided surface water is available, hence the link between climate smart agriculture and adaptation strategies to increase and upscale surface water availability.

What should be done for Sustainability of Agriculture and Food Production in NHSSA

The strategic decisions which will ensure sustainable production and increase food security across Sub-Sahara Africa therefore require policies which ensure the following:

- ✓ Implementation of conservation agricultural practices at community level and in more marginal areas across NHSSA. The shift in agricultural practices should be done along the methodologies demonstrated by the experiments of conservation agriculture.
- ✓ Identification and use of crop varieties most suitable for given agro-climatological zones. This should include drought resistant and faster maturing crop especially over the arid-and semi-Arid lands across Sub-Sahara Africa.
- ✓ Increased investments in technologies which conserve and restore ecosystems productivity in general.
- ✓ Increasing surface water availability through expanded reservoirs for storage of runoff and flood waters.
- ✓ Using the stored surface water to upscale irrigated agriculture and controlled crop growing environment to enhance food productivity.
- ✓ Increasing institutional capacity to ensure that field programmes and activities do not lead to mal-adaptation.



- ✓ Increasing technical cooperation between Sub-Sahara Africa, the EU and other development partners in implementation of large scale agricultural adaption technologies in various countries within Sub-Sahara Africa region.

These strategies are strongly recommended to be pillars in the international, regional and national adaptation plans. Scientific cooperation for sustainable development, in view of the adverse implications of Specific warming levels in agricultural productivity across Sub-Sahara Africa is urged between international economic blocks and authorities, in particular the European Union (EU) and the Inter-governmental authority on development (IGAD).