

Strategic Knowledge & Innovation Advice for Water & Climate in Africa

Executive summary

African countries are expected to be affected most by climate change^{1, 2}. In order to identify what knowledge base is required in the long term for improved climate adaptation in Africa, AfriAlliance applied a mix of top-down and bottom-up approaches. Based on an analysis of existing long-term research and innovation initiatives³, expert interviews and a Call for Ideas, this policy brief provides strategic advice and distills six (6) Key Messages for African policy makers.

Key Messages for African Policy Makers

In the interest of strengthening the preparedness of the water sector in Africa for climate change impacts, AfriAlliance issues the following key messages for African policy makers:

Climate change concerns need to become part of daily water management in Africa

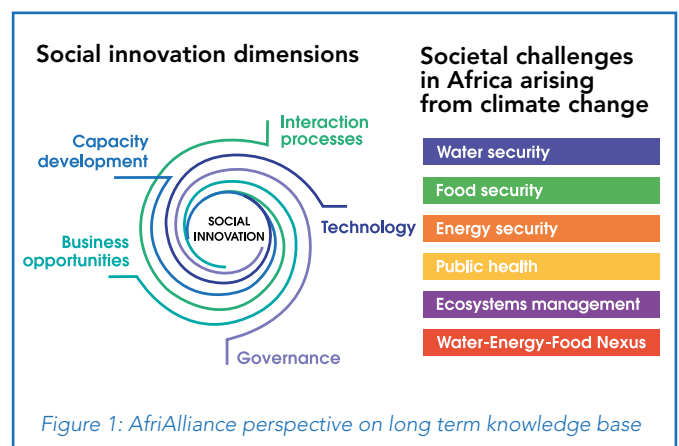
Many African countries already struggle with day-to-day challenges regarding water management and capacity gaps in the water sector. They require a strengthened research, innovation and knowledge base, solutions and tools to effectively deal with the additional challenges that climate change poses. Hence the call to incorporate climate change as a top priority and to form part of "regular daily practice" in the water sector. This could be done by mapping the impacts of climate change and incorporating the insights into national water management visions/agendas.

Beyond water security

Covering *all* societal challenges that are important to address in the context of water and climate change: significant attention has been paid to water security, but the long term knowledge base needs to include insights on climate change impacts for food security, energy security, public health, ecosystem management and the water-energy-food nexus.

Beyond the 'ivory tower' of science and research

Knowledge and innovation are not created by scientists and researchers alone. They are not the only source of ideas and solutions and will not work if there is no integration and cooperation between different stakeholders such as academia, private sector, civil society and government. Efforts need to be made to tap into all relevant local and national knowledge and innovation sources by strengthening interactions among African stakeholders, particularly end-users of innovations and solution developers.



Flagging themes in agendas is necessary but not sufficient...

...to strengthen the preparedness of the water sector in Africa in the long run. Due attention has to be given to the implementation of these agendas (beyond financing) to ensure sustainability, which includes the fostering of new innovation business opportunity niches. Combining the five dimensions of social innovation ensures that societal challenges are addressed effectively, as well as sustainably drawing on the innovation potential of African societies.

Don't shy away from complexity

Ways have to be sought to strengthen the knowledge base across interlinked themes and social innovation dimensions. It is necessary to go beyond 'silo'-ed approaches and separate disciplines, e.g. via dedicated climate round tables. Evidence and insights need to be combined on the joint impacts of population growth, economic growth and climate change across the African continent. This urgently calls for developing a knowledge base that stems from social innovation efforts across vested structures.

Go local and set course for balanced, long-term African collaborations with the EU

Africa-EU partnerships should take a holistic approach, considering all dimensions of social innovation and be characterized by African ideas, scalable solutions, local business opportunities in Africa and locally-focused implementation programs. Also, knowledge and communication drives should find avenues to showcase African solutions better and to a broader audience.

INTRODUCTION

Climate change presents new challenges for the water sector in Africa. African countries are expected to be affected the most by climate change, particularly from changing rainfall patterns and more extreme weather events, floods and droughts^{1,2}. The 2018 drought in Eastern and Southern Africa and Cyclone Idai in 2019 illustrated that climate change is already happening today and not a mere threat for future generations. Pressures on water resources will further increase and create additional challenges for institutions to manage water sustainably in the context of a changing, more extreme climate.

AfriAlliance found earlier that practitioners are focused on the day-to-day challenges of water management, at the expense of preparing for climate change impacts⁴. There is thus a pressing need to strengthen the knowledge base so that the water sector is better equipped to cope with climate change impacts as they magnify existing societal challenges (Figure 1). But what knowledge base is required to strengthen the preparedness of the water sector in Africa for the impacts of climate change in the long term?

AfriAlliance invited stakeholders within and outside Africa to help shape the AfriAlliance Strategic Knowledge & Innovation Advice (SKIA) for water and climate in Africa. The aim of the AfriAlliance SKIA is to provide insight into what research, innovation and new knowledge is required to strengthen the preparedness of the water sector in Africa for the impacts of climate change on water resources. This Policy Brief presents a summary of the resulting SKIA on water and climate in Africa.

75% of input for AfriAlliance study comes from the African continent **BOX 1**

- The vast majority of research & innovation agendas (incl. strategies, roadmaps) analysed by AfriAlliance for this study had been developed by African organisation(s).
- For the 73 needs identified by AfriAlliance via a bottom up study, 144 solutions were found to address them.
- Of the 81 respondents to the AfriAlliance Call for Ideas, 56 live on the African continent.

Identifying what knowledge base is required in the long term: how to?

AfriAlliance had already identified *six thematic water-related societal challenges* in Africa that arise from climate change: water security, food security, energy security, public health, ecosystem management, and the water-energy-food security nexus (WEF nexus).⁴

In addition to these thematic challenges, AfriAlliance proposes that structural knowledge and expertise gaps can exist in one or more of the *five dimensions of social innovation*: 1) technology, 2) capacity development, 3) governance structures, 4) business opportunities and 5) interaction processes between end-users and solution providers (Box 1).

In order to identify what research, innovation and knowledge base is required for improved climate adaptation in Africa, we applied both, a thematic and structural focus (Figure 1). AfriAlliance studied existing long-term research and innovation initiatives, undertook expert interviews and launched a Call for Ideas. Combining these top-down and bottom up approaches, we have paid particular attention to African inputs and perspectives (Box 1).

Top down: Analysis of research & innovation agendas for water and climate change in Africa

Existing research and innovation (R&I) agendas for Africa address the thematic societal challenges well, with water security covered most widely and the WEF nexus least of all six challenges (Box 2). Attention to distinct dimensions of social innovation is paid primarily to technology, governance structures and capacity development. Creating business opportunities and fostering interaction processes is raised in far fewer agendas.

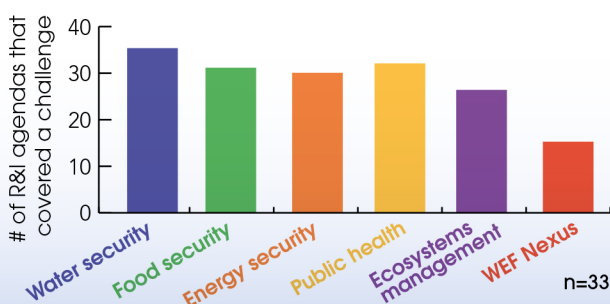
BOX 2

State of play (top down) – Focus of existing research and innovation agendas for Africa

Method: AfriAlliance analysed a total of 33 agendas on future research and innovation related to climate change and water in (parts of) Africa. These included vision documents (e.g. the Vision 2050 Eastern Africa or the Agenda 2063 African Union), Climate Change policies

(e.g. for Morocco) and major research programs (e.g. the South Africa Long Term Adaptations Scenario project). The analysis focused on the coverage of societal challenges (left) and dimensions of social innovation (right).

Thematic focus of agendas



Social Innovation dimensions addressed

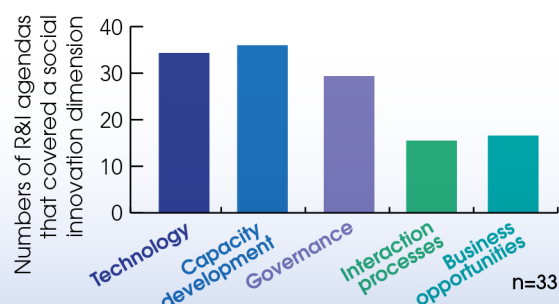


Figure 2: Coverage of societal challenges & social innovation dimensions in existing R&I agendas

State of play (bottom up) – Perceptions of professionals

Method In response to the AfriAlliance Call for Ideas (autumn 2018), 81 respondents indicated the size of knowledge gaps per societal challenges (Figure 3) and social innovation dimensions (Figure 4-9). Most respondents are based in Africa (69%); 26% in Europe

or elsewhere (5%). They work in the fields of research (36%), government (20%), service provision (14%), civil society (8%), or other (17%). Respondents had a working experience of 0-5 years (21%), 5-15 years (32%), 15-25 years (19%), >25 years (28%).

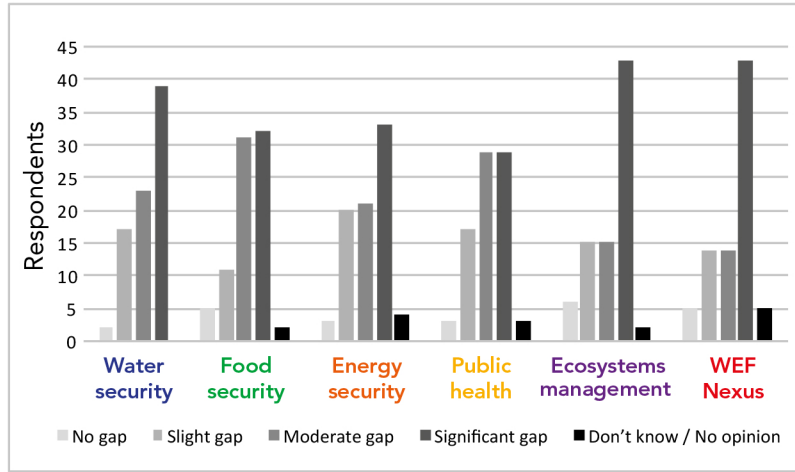


Figure 3: Perceived knowledge gap per societal challenge

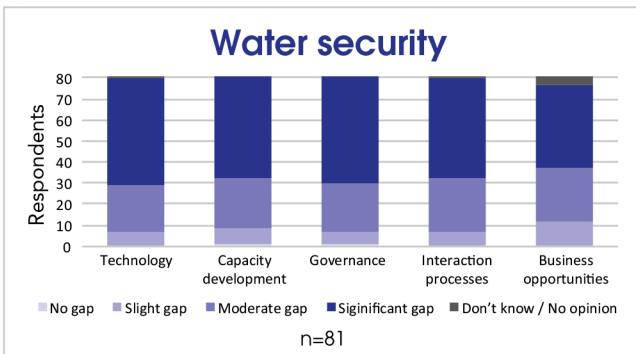


Figure 4: Perceived gaps in water security

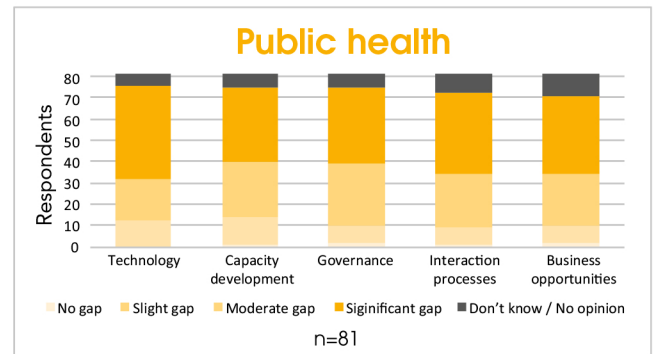


Figure 7: Perceived gaps in public health

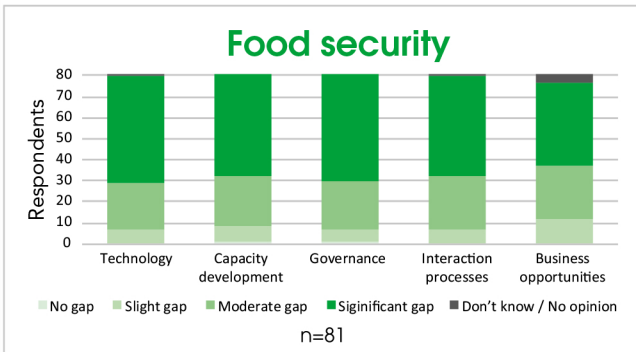


Figure 5: Perceived gaps in food security

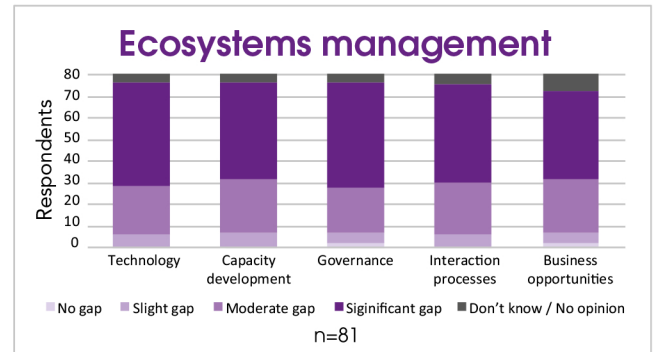


Figure 8: Perceived gaps in ecosystems management

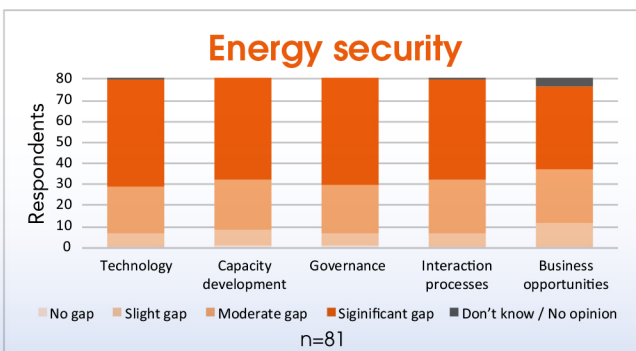


Figure 6: Perceived gaps in energy security

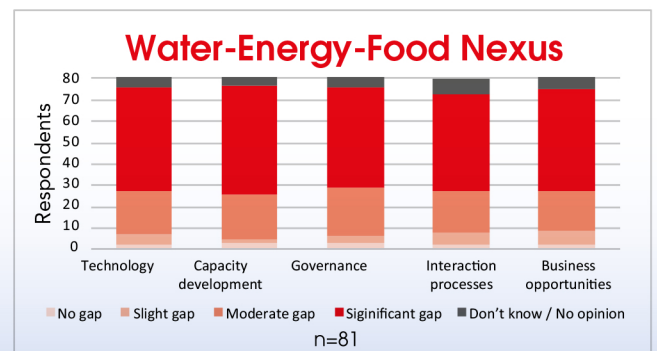


Figure 9: Perceived gaps in WEF Nexus

Bottom up: Professionals perceive major knowledge gaps

Professionals responding to our survey indicated that not a single societal challenge is well-addressed in practice. They signalled significant knowledge gaps in each thematic societal challenge (Box 3), regardless of their level of seniority. The largest gaps are perceived to exist in the management of ecosystems, at the WEF nexus and in water security. Also, for each thematic area, distinct gaps in all social innovation dimensions were stressed.

Bridge innovation silos

The results of both, the top-down and the bottom-up analysis, indicate that research and innovation efforts are focused on gaps related to technology, governance structures and capacity. These 'traditional' innovation dimensions are raised in the R&I agendas (Box 2), and the survey respondents also generally perceived the largest gaps to be in these aspects (Box 3). Other social innovation dimensions (interaction processes and business opportunities) were overlooked or deemed to have somewhat smaller gaps.

Tap into Africa's potential and re-orient Africa-EU innovation partnerships

There is a wealth of ideas on the kind of research, innovation and knowledge needed to address the societal challenges in Africa. In response to the AfriAlliance Call for Ideas, respondents (mostly from Africa) generated 105 ideas on how to raise awareness for climate change and cope with water, food, energy, health and environment challenges. These ideas reveal that a lot of the R&I potential remains unexploited as there is limited realisation of the relevant knowledge generated outside the 'ivory tower' of science and research institutions. Ideas are formulated, but there is a reluctance to implement new technologies. Local needs and solutions are often neglected.

These constraints can be turned into opportunities by formulating innovation policies that emphasise local needs and solutions, while simultaneously creating business opportunities. By "going more local" and promoting dialogues among entrepreneurs, end-users and solution developers, Africa may attain a stronger, more convincing position and reorient Africa-EU innovation partnerships.

Next steps for AfriAlliance

AfriAlliance is a five year project funded by the European Union's Horizon 2020 research and innovation programme, running until 2021. The ultimate objective is to strengthen African preparedness for future climate change challenges.

AfriAlliance facilitates the collaboration of African and European stakeholders in the areas of water and climate innovation, research, policy and capacity development by supporting knowledge sharing and solution transfer.

Rather than creating new networks, the 16 African and European partners in this project consolidate existing ones. AfriAlliance will take the following next steps to foster the uptake of its key messages for policy makers in Africa:

- Engage in further dialogue with key policy makers in Africa (e.g. African Union, AMCOW)
- Use the AfriAlliance Innovation Bridge Events for dialogue among policy makers, solution providers and end-users, and financiers about demand-driven business opportunities
- Engage in further dialogue with key policy makers in Europe
- Embed the identified long term knowledge gaps in the AfriAlliance online needs & solutions hub, www.afrialliance.org
- Share the >100 ideas via the AfriAlliance online platform

AfriAlliance is coordinated by the IHE Delft Institute for Water Education

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