



**UNITED NATIONS
FOOD SYSTEMS
SUMMIT 2021**

Independent Dialogue

Managing the water and energy we eat: advancing water-energy-food (WEF) nexus approaches to achieve food systems transformation in Southern Africa

13
April 2021

13:00 – 16:00 (CAT)



https://uso2web.zoom.us/join/78pEtYn3kmdBg_vdz_5gCenJlq1



Under usual circumstances, Southern Africa faces an uphill battle to achieve food and water security. Roughly 43% of the region is either arid or semiarid, 70% of its people rely on rain-fed agriculture, while the increasing frequency of droughts and other extreme weather events threaten the sustainability of agriculture at large. Urban and youth populations are bulging. And while irrigation has the potential to boost agricultural productivity by 50% or more in certain areas, it currently accounts for less than 10% of the region's arable land. This has led to a focus on how the increase of the area under irrigated agriculture could lead to improvements in land productivity, and what the energy requirements would be to enable this.

Currently, however, these usual circumstances have been worsened by unusual times – bringing age-old questions back to the fore – can Southern Africa feed itself, does it have enough water to do so, and can it do so in a crisis? During the lockdown period of the COVID-19 pandemic, many communities in the Southern African Development Community (SADC) were placed at risk of greater exclusion as a result of the restrictions on movement and limited access to communication platforms due to data requirements and costs. COVID placed further stress and attention on the importance of food, water, and energy security, as governments focused their efforts not only on blocking the transmission of the disease, but also considering how their responses affect food security today and in the future. The crisis affected workforces, transportation systems, and supply chains - the very basis of how our food gets from field to fork. The need for food sovereignty is therefore clear, along with a focus on reducing imports like rice, oil, and wheat. To achieve zero hunger (SDG 2, food security) in the region, there needs to be a transformative shift in how/what/where we farm, how we manage water, and how we, to a larger extent, move away from global commodity chains to re-localize food systems and stimulate regional trade.

In addition, irrigated agriculture is essential to satisfying the increasing demand for food. Yet, in water scarce regions such as Southern Africa, water-use for irrigation aggravates the competition for the use of water for other purposes, such as energy production, drinking water and sanitation. Solutions for sustainable food production through irrigated agriculture require a systemic approach to assess benefits and trade-offs across sectors. Here, the water-energy-food (WEF) nexus has become an important concept in natural resource management. It has been conceptualized to analyse linkages and trade-offs between the three sectors, across temporal and spatial scales.

Yet, while the interdependencies and trade-offs between water, energy and food are well-known and understood, the level of institutional, policy and sectoral coordination are often not. Additionally, water security is a priority for energy and food production, though these two sectors may differ in the prioritization of the ways in which they achieve and/or ensure water security. For all sectors, the legislation has traditionally been, and to a large extent still is, oriented towards maximizing production, and there is arguably little recognition that environmental sustainability is important for maintaining water, energy and food security.

This regional dialogue therefore seeks to unpack the questions: *how can food systems be localized and transformed in a water-constrained region such as Southern Africa in a manner that acknowledges WEF nexus linkages and promotes regional trade?* The IWMI and partners of the CGIAR and beyond will expand on these issues in this pre-UNFSS2021 session in an interactive manner that allows for small group discussion, collective brainstorming, and agenda-setting.

Curators: Dr Inga Jacobs-Mata (IWMI) / Dr Maike Hamann (CST/GRP)

The Road to UNFSS2021: Achieving water and food security	Prof Joachim von Braun (Chair of the Scientific Group for the UNFSS)
The Road to UNFSS2021: The role of water in food systems transformation	Dr Mark Smith (DG, IWMI)
Progress and challenges in achieving SDG 2: Zero Hunger in the region, and implications for water, energy and food security	Mr Duncan Samikwa (Senior Programme Officer for Food Security, Directorate for Food, Agriculture and Natural Resources (FANR), SADC)
Panel discussion: realising more just systems transformation for food and water security in Southern Africa	<p>Ms Anna Cestari (Senior Water Resources Specialist, World Bank);</p> <p>Mr Dhesigen Naidoo (CEO, Water Research Commission);</p> <p>Ms Shamiso Kumbirai (SDG Water Investments Officer, Global Water Partnership-Southern Africa);</p> <p>Dr Ku McMahan (Team Lead, Water and Energy for Food, USAID)</p> <p>Dr Million Belay (Ethiopia and Co-ordinator of the Alliance for Food Sovereignty in Africa)</p> <p>Dr Simon Mwale (Head of Programmes, Partnerships and Resource Mobilization, CCARDESA)</p>
Breakout group discussions	All
Feedback from breakout discussions in plenary	
Wrap-up of key messages and next steps	Dr Jemimah Njuki (Director for Africa, IFPRI)

Audience participation:

The success of the Food Systems Summit Dialogue depends primarily on the participants and the ways in which they interact with each other. They achieve this through exchanges, in Discussion Groups, which include diverse actors from across the entirety of food systems; follow the summit’s principles of engagement; discuss long-term visions for sustainable food systems; encourage sharing of reflections, building on knowledge, experience and wisdom; reflect the consensus and divergence that emerges among the participants; identify priorities for action within the context of current realities.

This dialogue is therefore open to stakeholders in the water, energy, food and related sectors ranging from intergovernmental organizations; regional, national and local government departments/entities, development partners; non-governmental organizations; the private sector, research for development organizations; academia; farmers’ groups; and networks.

The Dialogue will be conducted under the Chatham House Rule, where participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed.

Thematic areas to be covered in breakout groups:

1. Moving towards low carbon energy for food production

Food production relies heavily on pumping groundwater in arid and semi-arid regions across the globe. Yet Sub-Saharan Africa's groundwater resources are, on the whole, vastly under-utilised, thereby providing considerable scope for expanding productive use through solar pumping if these resources were developed effectively and managed well. Sub-Saharan Africa's groundwater reserves are estimated to be 20-fold greater than all surface water held above ground in lakes and reservoirs. While all major freshwater resources have a role in providing irrigation for domestic livestock, groundwater resources could be of critical importance to unlock the solar market in Sub-Saharan Africa and improve the welfare of small farm households.

Over the last decade solar pumps have become an increasingly important alternative source of energy in the agricultural sector. The use of renewable energy sources may also lead to environmentally friendly, sustainable and viable sources of energy contributing to global reduction in greenhouse gas emissions and sustainable food security. The reduced costs, by replacing increasingly costly fossil fuel inputs with distributed renewable energy grid, may also reduce food prices and make farmers more resilient and independent of national power grids.

The session will discuss the role of renewable energy sources in the agricultural sector as a means of enhancing sustainable food security and explore the existing technologies, policies and emerging opportunities in renewable energy application in the agricultural sector. The breakout group will further examine key opportunities and constraints in the adoption of the WEF nexus for food production and associated processes across all scales in line with the UN Sustainable Development Goals (SDGs) and interlinked cross-cutting issues.

Key question:

How can we sustainably produce more food in the region using low greenhouse gas energy sources?

2. Climate change impacts on water and food security

Climate change is projected to increase the number of drought days in Africa and shorten growing seasons. Droughts, floods, and tropical storms are the climatic events that most affect food production. In Africa, droughts cause more than 80 percent of all damage and losses in agriculture. While there is some uncertainty about the nature of future climate change effects and their impacts on food production systems, current projections should raise significant concern. By 2100, growing seasons in much of Africa could decline by more than 20 percent. In 2018, researchers reported significant increases in periods of prolonged dryness in Africa, including in the Sahelian zone where the frequency of such periods increased by up to 50 percent compared to long-term trends. Substantial increase in drought risk—a major driver of crop and livestock production shortfalls—is projected for large parts of Africa. This at a time when the number of people to feed will almost double by 2050 to over 2 billion.

Climate change poses a serious threat to crop productivity in sub-regions within Africa that are already food insecure. The impact is projected to be highest in maize, millet, sorghum, and wheat. Maize, the most widely consumed staple across the region, will be particularly vulnerable. Climate change will also affect productivity in Africa's livestock sector. Depending on the location and prevailing production systems, water scarcity will lower the productivity of pastures, reduce yields of milk and meat, and increase the incidence of diseases. All this will translate into a significant deterioration in food security, if no action is taken.

Strengthening the productivity and resilience of African agriculture will depend critically on the ability of governments and their partners to bring science and innovation to the forefront of the development agenda. Urgent action is needed to improve climate adaptation of Africa's food systems. Incentives, knowledge, science,

and finance will all need to play a role, together with increased co-ordination among development partners, to improve the climate resilience of production systems, build efficient value chains, facilitate internal and external trade, and boost the purchasing power of the most vulnerable households. As countries contemplate a shift towards climate-smart investments, investing in agricultural research is more critical than ever. The high returns to investment in agricultural research and innovation are well documented, and a large body of robust empirical evidence shows that such investment is very effective at reducing poverty and hunger.

This breakout session will discuss what is needed to enhance climate resilience in the region in the face of increasing water scarcity.

Key question:

How can we sustainably enhance food security without compromising water security in the context of climate change?

3. Policy coherence and institutional coordination in water, food, energy and climate change that operationalize the WEF nexus

The WEF nexus approach requires a shared vision for water and food security in the SADC region, and one that is facilitated by improved policy coherence and institutional coordination. Stronger collaboration and cooperation across and between governments and its multiple tiers is needed to achieve this, along with strengthening policy synergies with the private sector and civil society. At present, there is a lack of connectivity in practice between the developed national policies for water, food security, energy, and climate change which hinders its implementation on the ground. Reliable and effective governance is critical for the operationalization of the WEF nexus approach. A critical aspect of effective governance is the engagement of participatory approaches including stakeholder involvement, and monitoring and evaluation of community responses, to ensure that the priorities of those affected by policies are being met.

The strong interdependency between water, energy, food and climate change in arid and semi-arid regions calls for robust interventions, i.e. an approach that integrates management and governance across sectors, and where conventional policy and decision-making in 'silos' gives way to an approach that reduces trade-offs and builds synergies across sectors in line with the global UN SDGs and climate targets. This breakout group will discuss the opportunities and challenges for greater policy coherence and coordination in the WEF nexus sectors.

Key question:

What practical steps can/should be taken to ensure policy coherence and institutional coordination to improve water, energy and food security in the region?

4. Advancing technical WEF models, tools and frameworks for decision making at multiple scales

Over the past decades, a suite of tools, approaches and models have been developed to conceptualise, illustrate, analyse and forecast the interdependencies within the WEF nexus. However, the vast majority of WEF nexus models and tools are technical in nature, and few are in a format that is easily understood by those for whom they were made. How then do we translate this technical language into information that is easily understandable and that helps to facilitate WEF nexus decision-making (about trade-offs, about future development planning etc).

Given the wide range of WEF nexus assessment tools and approaches already developed, researchers and policy-makers alike working on the development of new tools need to take stock of what already exists, and aim for the coordinated development of nexus-specific tools and methods. This break out discussion will not review the effectiveness of existing models and tools. Rather, it will explore the utilisation of integrated tools

and models in WEF nexus decision-making, the process of communicating these tools to decision-makers, the challenges and opportunities for data sharing at different levels of scale, and the elements needed to ensure successful uptake of said tools.

Additionally, given that the WEF nexus is often technocratically conceptualised, how then do we translate and communicate these conceptualisations to other levels of society as well? Decision-makers differ in scope and capacity – having to make decisions at small association, local, regional, national or international levels. As such, their interests and the complexity of their critical questions will differ. The challenge of modelling the WEF nexus is to provide a clear, simple, yet comprehensive way of unpacking nexus inter-dependencies and trade-offs. This break out discussion will therefore also unpack the protocols that are needed to ensure the necessary data exchange and communication channels are enabled to allow WEF nexus models to have value and support decision-making at different scales.

Key question:

How can WEF nexus models/tools facilitate new understanding of interdependencies and trade-offs in the WEF nexus, as well as foster data sharing and enhanced decision-making in the region?

5. Putting nature back in the WEF nexus: towards resilient food landscapes

Food systems are part of larger landscapes which include non-agricultural land uses such as protected areas for biodiversity conservation. Many important links exist between biodiversity and food system resilience, from the supply of inputs including land and wild pollinators for food crops to conflicts such as food raiding by wildlife. Critically, many rural communities in southern Africa rely both on ecosystem services provided directly by ecosystems (e.g. fresh water, wood for energy) and on nature conservation and associated tourism for their livelihoods and well-being. Thinking about food in terms of greater food landscapes highlights the many connections between food and other land uses, and raises the importance of building resilience not just within the WEF nexus, but also beyond. For instance, the COVID-19 pandemic has resulted in significant reductions of tourism income in many communities, with serious repercussions for livelihoods and food security in the region. What role do local food production systems play in these situations, and can they address the shortfalls caused by the reduction in economic activity? Also, what role do wild foods and hunting play in these crisis situations, and does a short-term increased reliance on and use of wild foods have long-term negative impacts on the state of the region's ecosystems and biodiversity? How can the needs of vulnerable communities be met while avoiding the crossing of critical ecological thresholds, which may compound the negative impacts on these communities?

Key question:

How do we build more resilient food and livelihood systems while protecting critical water sources, biodiversity, and other ecosystem services?

6. Community approaches to operationalise the WEF nexus

It has been noted that the operationalisation of the WEF nexus becomes more tangible as you move from global to local scales. That is to say, there are more concrete examples of integrated WEF nexus solutions at the community or sub-catchment level than there are at the national or regional levels that demonstrate the 'WEF nexus in action.' The unifying theme is putting communities, particularly vulnerable groups, at the centre of the transformation of water and food systems. These include community-based approaches that promote food sovereignty and the inclusion of women and youth in the design, financing, and contracting of water infrastructural development for multiple uses; participatory and inclusive sustainable management of

water resources; integrated cropping practices; solar irrigation etc. An appropriate framing for this thematic domain is realising transformative change – that is striving for improvement of livelihoods through step changes (helping farmers to step up or step out of farming) but also acknowledging the resilient systems that keep power structures in place, understanding where to intervene, which systems we should work to systematically break down, and achieve different impacts for different people. It also adopts an inter-sectional and a broader gender, equity and social inclusion (GESI) approach, acknowledging and needing to tailor its specific activities to multiple country contexts, stakeholder and vulnerable groups, scales, identities and cultures. This breakout discussion will further explore success stories in the region, unpack the structures that hinder youth/women empowerment in WEF nexus solutions, co-identify the root causes of that, and how they can be addressed. Through this discussion, we hope to further advance issues pertaining to how partners can co-develop pathways to co-create change within water and food systems, by influencing the critical set of leverage points, and how they could trigger systems transformation.

Key question:

How can we promote equity and inclusion in WEF nexus governance to create opportunities for transformation towards more just food, water and energy systems?

Cross-cutting themes:

- Equity and inclusion
- Scaling
- Data sharing
- Digital innovation
- Innovative finance solutions
- Capacity strengthening
- Inter-regional trade

About the UNFSS Dialogues

The **Food Systems Summit Dialogues** are an approach for enabling systematic, inclusive opportunities for stakeholders to be engaged in food systems. The approach enables participants to contribute to the **2021 Food Systems Summit** by building on efforts already underway, working together on pathways that lead to sustainable food systems, and setting out intentions and commitments in the run up to the Summit. These Dialogues contribute to shaping the pathways which will lead to equitable and sustainable food systems by 2030. They will also be valuable to the different work streams preparing for the Food Systems Summit: the Action Tracks, Scientific Groups and Champions as well as for other Dialogues.

The Dialogues are moments for: engaging actors in the food systems approach, in unusual ways; enabling them to explore ideas together; encouraging creativity, emphasising equity; emerging more powerfully through connections; elaborating pathways, intentions and commitments together.

The International Water Management Institute (IWMI) and global and regional partners have committed to host a series of multi-stakeholder dialogues that emphasise water’s transformative role in food systems. The objective is to bring the discussion on food and water systems in a changing climate to the global policy level and to provide tangible inputs into the discussion of the UNFSS.