United Nations
Economic Commission for Africa

WISER

WISER Pan Africa

Technical workshop on analyzing the socio-economic utility of weather and climate information services for the food-energy-water

Safari Park Hotel

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Background

'Nexus thinking' is an approach that recognizes the critical interdependence of food, energy and water in an increasingly resource constrained world. Understanding and improving how we manage and use these resources is a process full of uncertainty but it is needed, especially in the face of climate change. There is a critical need to equip both individuals and institutions with research, capacity building and new tools to plan for a better, and climate resilient future.

New methods are needed that address a specific gap: conventional forecasting tools and analyses are often comparatively static (mostly employing linear approaches) and are narrowly focused on a sector or a specific set of thematic indicators. A systemic approach is instead required that considers social, economic and environmental indicators within a sector, and link them across sectors to generate dynamic projections that allow to estimate policy outcomes for all economic actors.

This is critical to analyze the impacts of extreme events, as well as to increase adaptive capacity, in the anticipation of climate change impacts. Extreme climate events such as droughts, heat waves, floods have huge impacts on society and ecosystems and their trends are thought to be correlated with global climate change (EICC, 2009). Particularly in vulnerable countries and communities in Africa, the combination of increasing temperatures and shifting rainfall amounts and patterns will have severe impacts on agriculture systems and food security with huge consequences of loss of life and livelihoods (UNFCCC, 2006). In addition to its impact on agriculture and food security, extreme climate events affect water resources management in the region. These include flooding, drought, sea-level rise in estuaries, drying up of rivers, precipitation and water vapor pattern distortions, snow and land ice mal-distribution, and changes in both ground and surface water supply for domestic, agricultural and industrial uses, including irrigation, hydropower generation, navigation and fishing (Walter et al., 2004; Milly et al., 2005; Bates et al., 2008; IPCC, 2008). These effects when compounded together have devastating impacts on ecosystems and communities, ranging from economic and social impacts to health impact, all of which threaten the continued existence of many regions in Africa (Urama & Ozor, 2010). This is what the Nexus is, a systemic view of the performance of key sectors, analyzed in this case through the lens of climate resilience.

Many tools are being put forward to inform decision-making by estimating the short, medium and longer-term outcomes of investments across social, economic and environmental dimensions (Bassi, Bečić, & Lombardi, 2014). On the other hand, the results being produced by these tools are not all that useful for the end-users they are designed to support in the first place (Rozema & Bond, In press). This is because they miss the capability to present the cross-sectoral impacts of interventions, leaving room to the creation of (unexpected) side effects. This is often the case for climate adaptation, and weather information. Current research has already pointed out that there is a need for more appropriate decision-support tools for development bank investors (ADB 2014) and public decision-makers (UNEP, 2014) that include quantified cross-sectoral linkages and environmental externalities (Bassi, Bečić, & Lombardi, 2014). This is because most impact assessment tools are designed to evaluate one single dimension of development (i.e. economic, social or environmental), and only their combined use is likely to provide effective support to decision making. Moreover, many tools and methodologies are developed following frameworks that cannot be easily customized to the local context, which prevent analysts and decision makers from utilizing the results of the assessment to inform their specific development priorities (Wallhagen & Glaumann, 2011).

This workshop is organized to discuss the application of a systems approach for the estimation of the Socio Economic Benefits (SEB) of climate information for the food, energy and water sectors in Africa. The work performed focuses on climate adaptation and includes the estimation of an integrated cost benefit analysis (CBA) of each intervention option simulated. The countries for which the models have been customized are Cameroon, Mozambique and Uganda. Inputs will be sought to validate the model, and to identify recommendations for future work and policy formulation at the country level.

Scope of activities

The workshop includes several activities: it introduces the project, the concept of Nexus and the methodology used; it then presents the models developed, their assumptions and results; a hands on session will be proposed, for participants to review the model and simulate scenarios with the Vensim software. The workshop is expected to lead to several open conversations among participants, both on the technical validity of the model and on the application of the Nexus concept at the country level.

Expected outcomes

- Improved understanding of the Nexus concept
- Increased capacity to analyze the SEB of weather information
- Higher familiarity with systems models and with the software Vensim
- Improved familiarity with the Integrated Cost benefit Analysis, the economic method used to analyze policy interventions and investments

- Validation of the system dynamics models for food, energy and water, pilot and country level
- Compilation of recommendations for future work, and for policy intervention at the country level