Policy Brief 18

WISER
Weather and Climate Information Services for Africa

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Using a nexus approach to improve climate resilience and benefit society, the economy and the environment

KEY MESSAGES

- Using a nexus approach makes it possible to identify potential synergies and bottlenecks, which can be used to determine if a project or investment is economically viable. Climate adaptation most often gains relevance under this approach.
- A multi-stakeholder approach is needed for a nexus approach to integrate knowledge across domains.
- Investment in data collection and dissemination are required. Climate information services can be very useful for supporting efforts to create strong synergies in policy planning and investment analysis when using the nexus approach.

To address a specific gap, the Economic Commission for Africa (ECA) has been using conventional approaches, policy and investment assessments along with forecasting tools. The analyses conducted are often comparatively static (mostly employing linear approaches) and narrowly focused on a sector or a specific set of thematic indicators. Instead, a systemic, nexus approach is needed that takes into account social, economic and environmental indicators within a sector, and link them across sectors to generate dynamic projections that make it possible to estimate policy outcomes for all economic actors

Challenges, issues, and discussion

Many tools are being considered to inform decision-making by estimating the short, medium and longer-term outcomes of investments across social, economic and environmental dimensions.[1] However, the results being produced through these tools are not useful for the end users they are designed to support in the first place.[2] This is because they fail to consider the cross-sectoral impacts of interventions, leaving open the possibility of (unexpected) side effects, especially in relation to the uncertainty brought about by climate change.

Recent research has already stressed the need for more appropriate decision-support tools for development bank investors and public decision makers[3] that include quantified negative environmental externalities for local communities and national economic priorities, such as sectoral development, poverty reduction, and job creation.[4] This is because most impact assessment tools are designed to evaluate a single dimension of development (economic, social or environmental). However, effective support to decision-making is only possible through the combined use of all dimensions. Moreover, many tools and methodologies are developed following frameworks that cannot be easily customized to the local context, which makes it very difficult for analysts and decision makers to use the results of the assessment to identify specific development priorities.[5]

1 Andrea Bassi, Emira Bečić and Nocoli Lombardi, "An introduction to the sssessment of sustainable paths, models and metrics,. Asian Social Science, vol. 10, No. 11 (2014), pp. 17–-27.
2 Jaap G. Rozema, and Alan J. Bond, "Framing effectiveness in impact assessment: discourse accommodation in controversial infrastructure development", Environmental Impact Assessment Review, vol. 50, (January 2015), p 66–73.
3 United Nations Environment Programme, Using Models for Green Economy Policymaking (Nairobi: UNEP, 2014).
4 Andrea Bassi, Emira Bečić and Nocoli Lombardi, "An introduction to the sssessment of sustainable paths, models and metrics,. Asian Social Science, vol. 10, No. 11 (2014), pp. 17–-27.
5 Marita Wallhagen, and M. Glaumann, "Design consequences of differences in building assessment tools: a case study", Building Research and Information, vol. 39, No. 1 (February 2011), pp. 16–33.

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The Economic Commission for Africa is applying the well-known dynamic modelling technique in its climate adaptation work. The focus of the approach is on disaster risk reduction, climate information services and green economy policy. This modelling work is designed to support development planning aimed at leveraging investments to accelerate progress. It builds on existing work, and practically integrates economic assessments with social and environmental impacts, so that planning exercises at the sectoral level become more effective.

The modelling approach was tested for three countries (Cameroon, Mozambique and Uganda) and is focused on three key nexus sectors (agriculture, energy and water). Three models were developed in isolation and then connected to one another, to carry out a more systemic analysis that represents the nexus approach.

The models are dynamic, and represent reality using feedback loops, delays and non-linearity. Specifically, agriculture production depends on the amount of productive agriculture land and the yield per hectare of cropland, which is affected by water availability and floods; electricity demand is driven by population and per capita electricity consumption, while supply is comprised of the installed capacity, thermal and renewable, and the average load factor based on the electricity technology mix, all of which are influenced by floods, and droughts in the case of thermal generation; and water supply is determined by precipitation and cross-border inflows along with evapotranspiration, which reduces the amount of water resources available in the country.

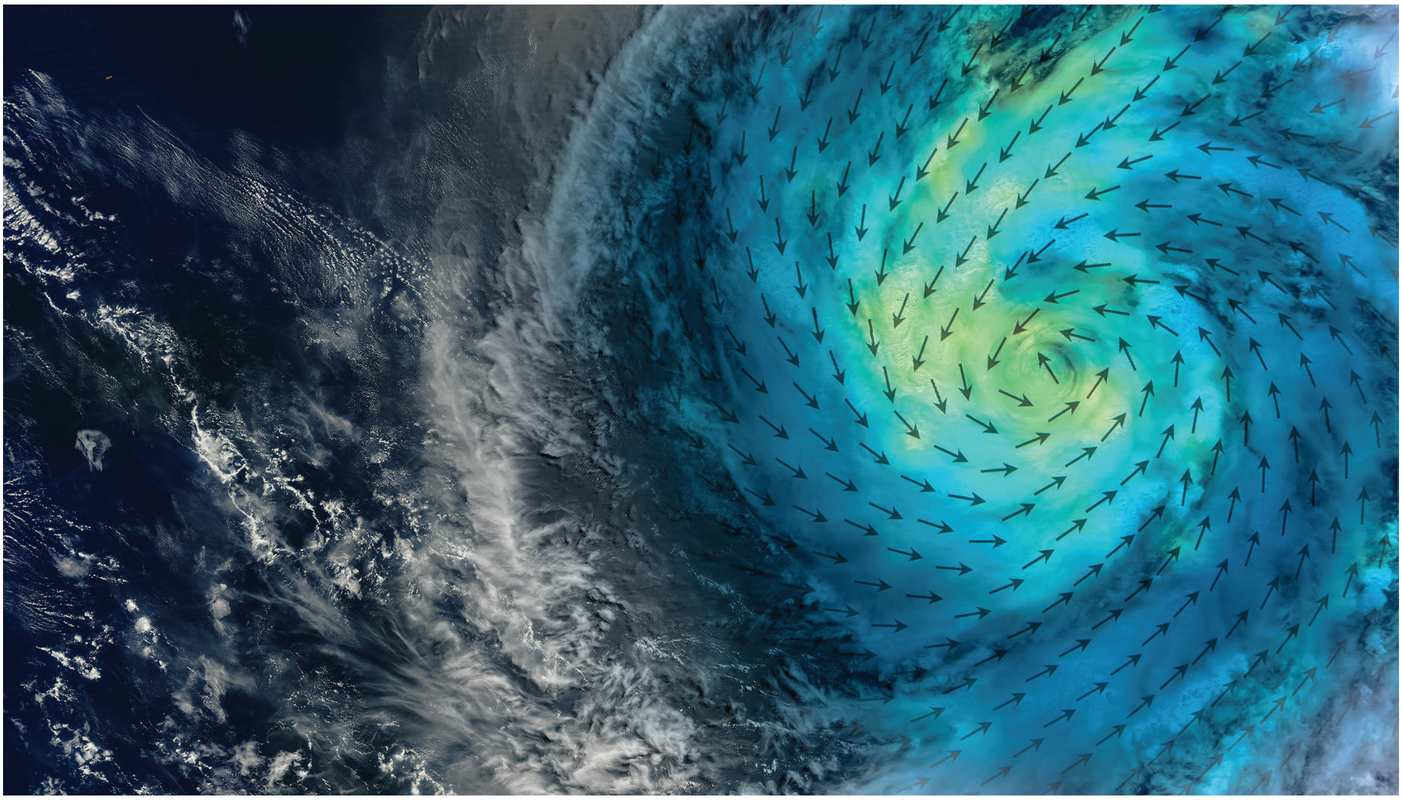
Three scenarios were analysed: a business as usual case, in which climate trends were not included; a climate scenario, in which a projected precipitation variability was used, and an adaptation scenario, which included interventions to improve climate resilience.

In the climate scenario, climate impacts are projected to reduce agriculture gross domestic product (GDP) by between 12.1 and 16.7 per cent and additional investment in power generation capacity is required to replace capacity that is damaged during flood events.

Under the adaptation scenario, it is assumed that the implementation of interventions will reduce the vulnerability of climate impacts. To increase the resilience of the agriculture sector, a transition towards organic farming practices is simulated. In the energy sector, the implementation of decentralized renewable energy is aimed at reducing the vulnerability of power generation capacity to climate impacts. Finally, to increase water security, a transition to drip irrigation is assumed.

The adaptation scenario shows higher GDP, which can be attributed to avoided damage and new growth opportunities. The latter are driven by more efficient water and energy use, which increase the adaptive capacity of the economy. Employment is also higher under the scenario, leading to synergies for society.

These results highlight that several synergies emerge across sectors when using a systemic, nexus approach. For example, the reduced use of water through drip irrigation allows for greater agriculture



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production and lower energy use, resulting in lower costs, higher revenue, and improved nutrition and income.

Using a nexus approach makes it possible to identify potential synergies and bottlenecks to be used to determine if a project or investment is economically viable. The approach generates positive synergies, which can increase climate resilience and lead to a stronger economic performance. Similarly, cross-sectoral impacts emerge for health and livelihoods in which investing in climate adaptation not only improves climate resilience, but it also increases social and economic resilience for the local population.

Recommendations

The benefits brought about by the use of a systemic, nexus approach are considerable. Below are eight recommendations to stimulate the use of this approach at the country level to remove sectoral barriers and maximize value for money for public and private investment:

- Encourage the use of systemic planning across sectors and social, economic and environmental indicators of performance to operationalize the nexus approach.
- Use a multi-stakeholder approach to ensure that all key indicators are considered and that policies are formulated and implemented effectively.
- Support the development of new quantitative forecasting models that can be used to implement knowledge integration across disciplines, and fully account for climate science to incorporate weather forecasts, project climate impacts, policy and investment outcomes on climate vulnerability, adaptive capacity and resilience.
- Increase investment in the collection, processing and use of weather information, including early warning systems.
- Invest in climate information services and disseminate information received in a timely manner. This would serve as a foundation for improved planning and more timely interventions.
- Require the preparation of integrated economic analysis, cost-benefit analysis that includes economic, as well as the economic valuation of social and environmental project and investment outcomes.
- Establish a technical interministerial working group, supported by representatives of academia, to assess sectoral and systemic resilience, with the goal to strengthen policy coordination.
- Conduct an annual assessment on the potential budgetary savings emerging from the improvement of climate resilience, and provide incentives for private investment aimed at reducing climate vulnerability.

About ACPC

The African Climate Policy Centre (ACPC) is a hub for demand-led knowledge on climate change in Africa. It addresses the need for greatly improved climate information for Africa and strengthening the use of such information for decision making, by improving analytical capacity, knowledge management and dissemination activities.

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