



SINCERE Flagship Action for Africa:

Towards a joint African-European call on innovative climate change research for the African regions

Online Survey – Concept Paper B

Option B: Monitoring environmental and socio-economic trajectories over a range of spatial and temporal scales in Africa

Context and rationale

Targets: The future of African countries heavily relies on their capacities to ensure a sustainable access to water, food and energy in a context of accelerating climate warming, population growth and land use/land cover changes (LULCC). Societies and governments are bounded to reaching the Sustainable development goals (SDGs) by 2030 while respecting their Nationally Determined Contributions (NDCs) to the worldwide commitment to keep global warming below 2°C, as stated in the Paris agreement (2015). There are a number of conflicting issues arising from these two targets. For one, the agricultural and industrial growth is still largely based on the production of CO₂-emitting energy and thus generates climate warming; secondly, population growth and urbanization are both major sources of land clearing modifying the water cycle and affecting biodiversity and continental life, whose preservation constitutes one of the SDGs; thirdly, there are intrinsic contradictions between the 169 targets making the 17 SDGs, linked to the trade-offs between reducing poverty in the short term and ensuring sustainability in the long run. The SDG's were officially agreed on by the UNO general session in 2015. One third of the time allowed to reach these targets has thus already elapsed, and we are clearly very far from having covered one third of the path leading to their completion. In the same way, the current CO₂ emission trajectory is far above the envelope required to keep global warming below 2°C.

Trajectories: Assuming that desirable objectives might not be reached in time for a number of reasons means that the path is as important as the target itself. Diagnosing that “we are not on target”, implies a wrong trajectory that must be analysed as such. What is its real starting point? What are the factors that condition it? In which way are the various trajectories leading to different objectives in conflict? And, of uttermost importance, what do we really know about these trajectories. At which speed is biodiversity decreasing, and which proportion of this decrease is caused by chemicals and industrialized agriculture? Are clean water resources increasing or decreasing? In which regions? Is that linked to basic changes in the hydrological cycle caused by global warming and/or by LULCC? How human actions at the local or regional level reinforce or mitigate the effects of global change? Are we accelerating along these trajectories? Are we changing them or have we the possibility and the supportive tools to change them?



We know very little about the local and regional trajectories. We also have difficulties in apprising to which extent they are conflicting each other: Africa being extremely vulnerable to climate warming and many regions being at the edge of desertification, socio-economic and eco-climatic trajectories are likely to collide at some point. The scientific community and the decision makers are lacking the proper integrative tools to monitor these trajectories (multi facet, multi level), to anticipate their evolution and to assess the socio-economic impact of their possible collision. There is thus an urgent need to promote innovative research and development in this area.

Objectives

In order to build up climate resilient and sustainable societies, research and development projects should promote and provide tools for integrative and systemic studies of environmental and socio-economic trajectories in various African regions over scales ranging from local to regional. One important objective is to assess what do we know about present trajectories and how reliable are scenarios on this topic with a particular emphasis on the combined effect of climate warming and socio-economic dynamics on land use and land cover (for instance the effects of large projects such as building hydropower dams or planting millions of trees for reforestation – partly linked to the compensation for CO2 emissions). There is a clear lack of appropriate observations, integrative methods and modeling tools to address how eco-climatic and socio-economic trajectories currently interact and how this might evolve in a context of global change. Systemic approaches, pertaining but not limited to agro-ecology, socio-hydrology, One Health, among others, are encouraged.