GLOBAL INFORMATION SOCIETY WATCH 2020

Technology, the environment and a sustainable world: Responses from the global South

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SUDAN

BARRIERS TO CLIMATE-SMART PLANNING AND SUSTAINABLE DEVELOPMENT IN SUDAN

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Introduction

In recent years, addressing climate change and promoting sustainable development have emerged as two sides of the same coin. Sustainable development can be defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[1] Under this definition, climate change has earned primary significance as it involves, among other things, the depletion of natural resources and a vulnerability with respect to habitability for both current and future generations.

For decades, global efforts have been made by international agencies, NGOs and local governments to address the climate change challenge as it affects development, livelihoods and environmental stability. Developing countries are at the forefront of this global challenge. A key question is how these countries, which lack needed infrastructure and technology, can move towards green growth and sustainable development. How does the low availability of technology and a lack of effective climate-smart planning impact the country's ability to respond to the climate emergency? What barriers does Sudan face in transitioning to a low-carbon economy?

Policy context

Climate change poses a significant challenge to development and resource use in Sudan. According to recent United Nations Environment Programme (UNEP) reports, without a solid intervention, Sudan can become uninhabitable due to drastic climate change and disaster vulnerability. Interestingly, Sudan is widely referred to as the country that witnessed the first climate change conflict.[2] It is argued that the arid lands in Sudan have seen one of the most brutal wars of the 21st century so far triggered by drought, famine and displacement.

Although Sudan does not have national climate change policies, in recent years this issue has been brought to the government's attention. The Ministry of Environment and Natural Resources submitted its National Adaptation Programme of Action (NAPA) in 2007.[3] In 2011, the Higher Council for Environment and Natural Resources (HCENR) established a climate change network to focus more attention on adaptation planning, including capacity building, awareness raising among government institutions, and outreach to media. Currently, UNEP is supporting the HCENR in the development of the country's National Adaptation Plan. In recent years, the HCENR has made some promising steps towards realising the sustainable development goals with a particular focus on mitigating the high risks of climate change. In 2017, Sudan ratified the Paris Agreement on climate change and submitted its Nationally Determined Contributions (NDCs) to the United Nations Framework Convention on Climate Change (UNFCCC).

Today, one of the greatest challenges that Sudan faces in addressing climate change and its risks is caused by the lack of sound metrological infrastructure and technologies that are crucial to assess the current state and forecast short- and long-term impacts of climate change. Sudan has also been under US economic and technological sanctions for over 25 years. This has hindered Sudan's ability to grow and continues to put a strain on technological advancements, and in turn sustainable development. Referring to the priorities outlined in Sudan's NDCs, the availability of technology, and information and communications technologies (ICTs) in particular, is crucial in monitoring climate change, mapping climate vulnerable hotspots, and transitioning to low-carbon technologies.[4] In 2019, HCENR submitted a national technical assistance proposal to the Climate Technology Centre and Network.[5] This

1 https://www.conserve-energy-future.com/what-is-sustainable-development-and-its-goals.php

2 Carrington, D. (2019, 18 December). How water is helping to end 'the first climate change war'. *The Guardian*. https://www.theguardian.com/world/2019/dec/18/how-water-is-helping-to-end-the-first-climate-change-war

3 https://unfccc.int/resource/docs/napa/sdn01.pdf

4 https://ndcpartnership.org/countries-map/country?iso=SDN

5 https://www.ctc-n.org/technical-assistance/projects/developing-methodology-and-capacity-monitoring-climate-change-and-its

aimed to aid the development of methodology and capacity building for monitoring climate change and its impacts. The proposal emphasises the need for technology in order to develop satellite systems and metrological technologies that are key to assessing and monitoring climate vulnerability, helping to mitigate its consequences, and reducing risks and uncertainties.

Today, under the new transitional government, the biggest challenge is to achieve economic growth and development while also protecting the environment and natural resources sustainably. The challenge here is that this sustainable transformation cannot take place in the absence of low-carbon technologies and related infrastructure, as well as the metrological capacity needed to monitor and maintain a low carbon footprint.

Several initiatives, but little institutional cohesion

Up until 2019 – and for the previous 30 years – Sudan had been under the authoritarian rule of Omar al-Bashir. Under that regime, there were two main government bodies that undertook the development of national environmental policies and regulations: the Ministry of Environment and Natural Resources, and the HCENR. Both of these faced particular governance challenges. First, there was an obvious mismatch between their priorities and those of the ruling party, as the latter made significant investments in gold mining and poor decisions around the petroleum and fossil fuel industry. Secondly, both institutions had similar mandates but worked separately with overlapping objectives as well as competing for government and foreign funds. The inconsistency and duplication of efforts in drafting the country's environmental policies undermined sustainable development efforts in Sudan. Abrupt changes and discontinuities, repetition, duplication or failure to implement or complete policies and interventions have all undermined the ability of lower-level institutions and communities to engage, understand or benefit from a devolution of management over natural resources.[6] Finally, different UN and aid agencies' work often overlapped across the two institutions, but with no internal coordination. This resulted in a dilution of solutions and ineffective climate action. These inconsistencies signalled Sudan's lack of readiness to undertake effective climate action and in turn the extent to which it was not equipped to receive more funding. In 2019, under the new government, the ministry was dissolved and the HCENR has become the main government body as well as the main focal point for the UNFCCC.

Nevertheless, challenges still remain. Adaptation and mitigation policies are diffused through different governmental bodies such as the Ministries of Agriculture, Environment and Energy. While coordination across different sectors and environmental integration across different ministries and institutions is crucial in addressing climate change, there remains ineffective coordination and cohesion across these three institutions. For example, all the above-mentioned institutions worked separately with a critical entity, the Sudan Metrological Authority (SMA), which provides short-term weather and climate forecasts for national planning. To this day, SMA is facing complex institutional issues due to a weak governance structure, inadequate planning and funding, and poor institutional engagement.

For example, in 2017, the SMA, the Ministry of Agriculture and the European Commission implemented an earth observation project named Anomaly Hot Spots of Agricultural Production (ASAP). ASAP focuses on finding areas where unfavourable growing conditions for both crops and rangelands may represent a potential food security problem.[7] While this project is a great steppingstone towards addressing climate risk and vulnerability in Sudan, the SMA has failed to effectively integrate its captured data in the activities of the HCENR and other ministries. This has had a disempowering effect on ASAP's end goal of providing support and a scientific basis for informed decision making. These governance failures are further driving unsustainable and uncoordinated resource management practices.

Technology: From capacity to data availability

A review of the Paris Agreement revealed a need for tailored evidence-based approaches to climate change and a demand for greater knowledge and building technological capacities.[8] Adaptation is a complex process that requires a systematic and knowledge-based approach. Therefore, technological capacity is key as it allows for climate-smart planning and the development of coherent

6 El-Harizi, K., Zaki, E. Z., Prato, B., & Shields, G. (2007). *Understanding Policy Volatility in Sudan.* International Food Policy Research Institute. https://www.ifpri.org/publication/understanding-policy-volatility-sudan

7 Fritz, S., et. Al. (2019). A comparison of global agricultural monitoring systems and current gaps. *Agricultural Systems*, *168*, 258-272. https://www.sciencedirect.com/science/article/pii/S0308521X17312027

8 https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

adaptation policies and response mechanisms. Furthermore, metrological technology is needed to assess vulnerability in states and countries, using remote sensing, drones and earth observation to identify vulnerable areas and support risk assessment. Within this context, Sudan faces major technological challenges, particularly in data collection and metrological capacity.

Data availability is a prominent issue in Sudan, as it undermines efforts to predict, plan for and respond to environmental problems. The ecological data available is inconsistent and only provides snapshots of data on climate vulnerability on a national level but not on timeframes and areas affected. Currently, the climate data provided by the SMA is very comprehensive but does not provide long-term climate forecasts. Moreover, services provided by the metrological authority do not meet the needs of stakeholders such as the private sector, farmers and international agencies. The models and technologies used cannot forecast the climate or weather for long periods, and in turn fail to predict and plan for natural occurrences that over time quantify and turn into disasters. As one interviewee said: ''Sudan is a country that lacks the availability of data where results or impact of interventions may not be seen or collected."[9]

Poor technological capacity and shortage of data raise a causality dilemma, particularly in climate-related funding. The European Commission Humanitarian Aid and Civil Protection policy emphasises that the general criteria for any humanitarian intervention must include a sound assessment of needs and risks, and data on the likely impact of the intervention on both immediate and future risks.[10] This is a valid requirement, so donors can allocate the climate-related funds in targeted and efficient ways. On one end, this requirement can deprive Sudan of much-needed climate technical assistance due to a lack of data and/or ongoing conflict in the country that negatively impacts data collection capacities. On the other end, this might present an opportunity where agencies such as the Green Climate Fund can engage in baseline analysis and assist Sudan in standardising its data collection and making better decisions regarding vulnerability and ecosystems.

The digital gap and technological lock-in

The digital and technological gap is possibly the most critical component in addressing the climate challenge in Sudan. The lack of infrastructure and technology is one of the main reasons behind the failure of the country's policies to respond to or mitigate the damages of climate change. There is also a lack of technical capacity to address vulnerability issues effectively. The technology component is key to assessing vulnerability, and to mitigating risks.

When it comes to the prospect of a transition from a carbon-intensive system to low-carbon systems, the role of politics with all its facets is as important as the ones played by technology and economics. The Sudanese political context has not made it easy to invest in new low-carbon technologies and climate-smart technologies. As previously highlighted, Sudan continues to face political instability and governance issues that challenge developing technological capabilities that require time, effort and commitment. The literature stresses the importance of an enabling environment for technological learning with regards to low-carbon technologies, including appropriate institutional and economic frameworks, sufficient absorptive capacity, large and stable demand for low-carbon technologies and supportive policies for low-carbon technologies.[11] Interestingly, the new transitional government has been gradually lifting fossil fuel subsidies in 2020. While the rationale for this decision is strictly economic, this will likely lead to less dependence on carbon-intensive systems and an increase in the national demand for cheaper low-carbon technologies, as well as relevant policy reforms.

Moreover, the US sanctions put a toll on technological advancements in Sudan. Among the many challenges that these sanctions have further amplified is inefficient electricity power grids, due to the lack of foreign investments for the past 25 years within the energy sector. This in turn increased the imports of oil derivatives and fossil fuel dependence. Sudan continues to face this recurring crisis and has limited access to diversify its energy mix and invest in building thermal and renewable energy plants. These sanctions, in a context in which the US happens to be the most important developer of new low-carbon technologies, alongside restricted World Trade Organization (WTO) policies due to Sudan's bad credit rating and history of missing

9 Interview with Amro Khalaf, head of the Founding Committee at the Sudanese Solar Energy Society, 27 July 2020.

10 DG ECHO. (2013). *Disaster Risk Reduction: Increasing resilience by reducing disaster risk in humanitarian action*. https://ec.europa.eu/echo/files/policies/prevention_preparedness/DRR_thematic_policy_doc.pdf

11 Pueyo, A., García, R., Mendiluce, M., & Morales, D. (2011). The role of technology transfer for the development of a local wind component industry in Chile. *Energy Policy Journal, 39*(7), 4274-4283. https://doi.org/10.1016/j.enpol.2011.04.045

payments, have constrained Sudan's ability to acquire foreign technology and the development of domestic technological capabilities.

Conclusion

Poverty and economic degradation have combined with a mix of institutional weaknesses as well as political constraints that have not allowed Sudan to ascend technologically, particularly in addressing climate change and vulnerability. Within this context, the first challenge that must be tackled is filling the gaps in the knowledge and technological capacity needed to capture scientific evidence for policy making. In all of the interviews for this report, respondents expressed their concerns on the dire need for national investment in planning and mapping technologies such as remote sensing, drones, and earth observation ICTs. This is particularly important for humanitarian agencies and civil society organisations to make informed decisions and initiate early interventions. It is expected that early intervention and mitigation will enable more sustainable and hence cost-effective results.

To build resilience and mitigate climate change risks, the government should take advantage of decreasing costs and invest in low-carbon technologies and related infrastructure. It is important to highlight the positive impact of these investments such as job creation for both genders, enhanced livelihoods and sustainable economic development. However, the major impediments to the implementation of low-carbon technology in Sudan are the current low electricity tariffs, low fossil fuel prices, the high capital cost of green technology relative to existing carbon-intensive technologies, and the high storage and running costs.

It also must be stressed that while the transition to low-carbon technologies primarily takes place on an institutional level, the behavioural lock-in and individual resistance to this transition should be factored in decision making. This resistance could be caused by gaps between society and decision makers, and limited familiarity or acceptance of the suitability/reliability of the new technology, including in the context of a reliance on indigenous knowledge systems. Overcoming this obstacle will likely require policy reforms and nudges in the form of awareness campaigns, highlighting economic incentives, and creating a demand for low-cost technologies by employing a policy mix of command and control and market-based instruments.

Action steps

In Sudan, civil society organisations are in a strong position to:

- Lobby for stronger regulatory frameworks, particularly on regulating the carbon footprint of carbon-intensive sectors.
- Bring together communities and public/private entities to influence the policy-making process and create a national demand for low-cost technologies and related infrastructure.
- Build local trust and raise public awareness on the impact of technological innovation to increase resilience and reduce climate shocks.
- Urge the government to create strategic international ties and leverage the latecomer's advantage to acquire proven climate-smart technologies that have the greatest impact, and offer the best value for money.
- Disseminate information and concerns to the international media and organisations on the negative impacts of the US sanctions, particularly on marginalised groups in Sudan.

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Technology, the environment and a sustainable world: Responses from the global South

The world is facing an unprecedented climate and environmental emergency. Scientists have identified human activity as primarily responsible for the climate crisis, which together with rampant environmental pollution, and the unbridled activities of the extractive and agricultural industries, pose a direct threat to the sustainability of life on this planet.

This edition of Global Information Society Watch (GISWatch) seeks to understand the constructive role that technology can play in confronting the crises. It disrupts the normative understanding of technology being an easy panacea to the planet's environmental challenges and suggests that a nuanced and contextual use of technology is necessary for real sustainability to be achieved. A series of thematic reports frame different aspects of the relationship between digital technology and environmental sustainability from a human rights and social justice perspective, while 46 country and regional reports explore the diverse frontiers where technology meets the needs of both the environment and communities, and where technology itself becomes a challenge to a sustainable future.

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