POLICY BRIEF

How to improve forecast dissemination in the Blue Nile River Basin: Challenges, opportunities and ways forward

Goal

This policy brief explores the ways how climate and weather forecasts are communicated across the Blue Nile River Basin shared by Ethiopia and Sudan, and how governments, global and regional organisations as well as development partners can support existing systems and practices.

Core Messages

- Investing in early warning systems offer a 10:1 return, averting millions in disaster damage, increasing the efficiency of dams like the Grand Ethiopian Renaissance Dam (GERD), and boosting agricultural productivity and rural livelihoods.
- Despite significant advances in forecasting science globally, the Blue Nile Basin continues to face a critical implementation gap: too few forecasts are translated into actionable information that reaches those who need it most. Poor dissemination is one of the key barriers.
- In Sudan, forecast provision has deteriorated in recent years due to the ongoing war, which has caused a near-total collapse of infrastructure. In contrast, the primary challenge for Ethiopia's more advanced system is bridging the "last mile".
- A significant 'access divide' separates users: whilst dam operators and other industrial users have better—though far from ideal—access to forecasts, rural farmers, pastoralists, and communities remain critically underserved.
- Realising the full benefits of forecasts requires considerable investment in infrastructure, human capacity, and communication systems, especially at local levels, as well as stronger cross-border cooperation.
- While indispensable for now, reliance on donor support is fragile. Recent development aid cuts highlight the urgent need for sustainable funding models that include stronger government and private- sector commitment.

Three Quick Wins

1) Set up a **Blue Nile Early Warning Task Force** for basin-wide coordination of hydro-meteorological forecasts, possibly under the umbrella of ESTAC.
2) Establish a **multi-language radio network partnering with local radio stations** for "last-mile" coverage
3) Develop a basin-wide early-warning data and visualisation platform as "single point of truth" for forecasts, possibly hosted by ICPAC.

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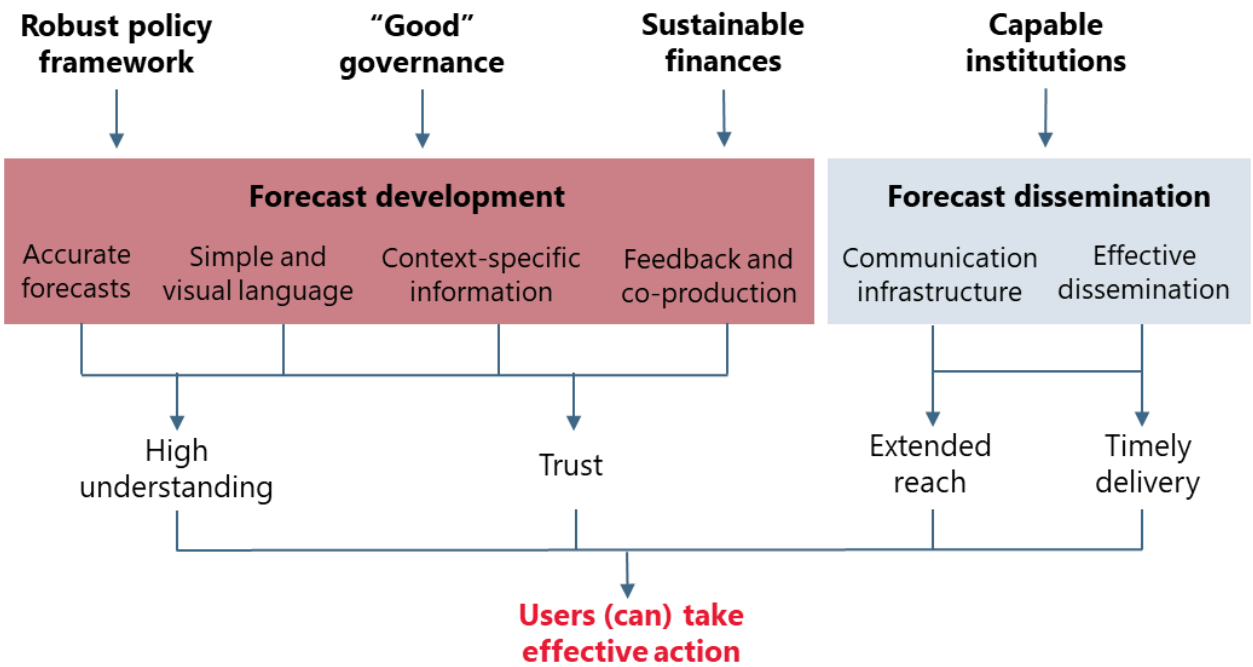
Forecast dissemination in the Blue Nile

Users: For subsistence farmers and pastoralists, given their strong dependency on rainfall, seasonal and sub-seasonal forecasts are essential for planning planting schedules, grazing patterns and water use, while short-term forecasts enable immediate action during extreme weather events. For rural communities, short-term forecasts are most critical for enabling timely disaster response to floods and extreme weather events. For dam operators, a combination of forecast types is essential, with seasonal forecasts guiding strategic planning and short-term forecasts enabling real-time operational adjustments.

Disseminators: At the national level, the Ethiopian Meteorological Institute (EMI) in Ethiopia and the Sudan Meteorological Authority (SMA) in Sudan play a central role in developing and disseminating forecasts, working within a broader network of governmental entities and various government ministries. National efforts are complemented by regional organisations such as the Intergovernmental Authority on Development (IGAD) Climate Prediction and Applications Centre (ICPAC) and the Eastern Nile Technical Regional Office (ENTRO), alongside NGOs, and the emerging private sector.

Channels: Radio remains the primary dissemination channel across the Blue Nile Basin, particularly among rural communities with low literacy rates. and in conflict zones. Mobile phone-based services such as SMS alerts as well as social media hold significant potential for expanding reach but are constrained by limited internet and electricity access, therefore, often unsuitable for improving "last mile" access. Email, newsletters, and web platforms are mainly relevant for institutional users.

Figure 1: The success factors for effective forecast dissemination



Policy Options

Infrastructure, Technology, and Information: Sudan is facing severe constraints as a direct result of the ongoing conflict that began in April 2023. Although Ethiopia's forecast systems are more advanced, they are hampered by limited access to telecommunications and electricity in remote areas. Poor communication infrastructure is a major obstacle to disseminating information to the "last mile", as radio is often the only viable channel in remote and conflict-affected areas.

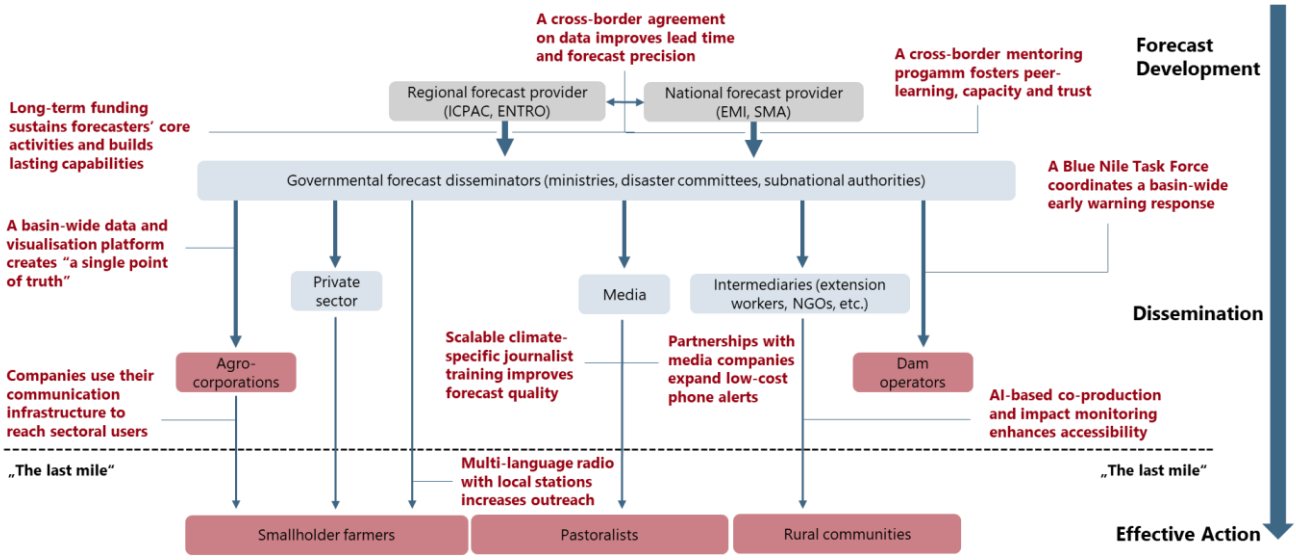
Communication Channels, Knowledge-Sharing, and Co-production: Where official dissemination is unreliable, informal channels play a key role and users often rely on several different sources of information, including radio. However, forecasts are often too technical and poorly tailored to local contexts, resulting in a lack of trust. To address this, it is essential to expand co-production, feedback and impact monitoring. It is equally important to strengthen intermediaries to reach the "last mile" and improve both translation and interpretation.

Human Capital and Capacity-Building: The Blue Nile region faces significant challenges in developing long-term capabilities, particularly at a local level. These challenges are exacerbated by issues such as a brain drain and limited resource. To ensure long-term effectiveness, investments should prioritise building operational capacity alongside equipment provision. A key opportunity to address these gaps is to promote highly scalable training for intermediaries.

Policy, Coordination, and Governance: Institutions often work in silos with unclear mandates, and cooperation between all levels is lacking. East Africa has more than 20 different hydrometeorological platforms, but a lack of interoperability hinders effective disaster risk communication. Dramatically improving institutional coordination and governance could be achieved by establishing a basin-wide Early Warning Task Force, formalising cross-border agreements, and creating a single, unified go-to platform.

Finance: Most of the funding is short-term, which hinders the prioritisation of long-term strategic actions. Transitioning from high donor dependency to a sustainable funding model by increasing national budget allocations and encouraging private sector investment is a critical priority. Securing funding for ICPAC's core operations and for remote forecasting in Sudan is equally crucial to sustain minimum forecasting services.

Figure 2: Key solutions for improving forecast dissemination



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Policy Recommendations

1. **Move from donor-dependency to a sustainable funding model by increasing national budget allocations and fostering private-sector investment**, prioritising investments that focus on long-term capabilities and a preventive rather than reactive approach, while ensuring essential forecast services reach everyone. Securing funding for Intergovernmental Authority on Development's (IGAD) Climate Prediction and Applications Centre (ICPAC) core operations and Sudan's remote forecasting—both highly vulnerable to current development aid cuts—is critical to sustain minimum forecasting services for many people in the basin, particularly in Sudan.

2. **Ensure minimum service provision in underserved and conflict-affected areas through a low-cost, high-impact multi-language radio in collaboration with local stations**—radio is the primary, and often only, source of information in these contexts—while gradually scaling up other technologies such as SMS alerts via expanded public-private partnerships with media companies as mobile phone connections and internet access become available. Additionally, leverage private-sector communication infrastructure for adjacent communities (e.g., provided by agricultural cooperatives who have relations to local farmers).

3. **Support multiple channels—including radio—to improve the reliability of forecast delivery in areas where governmental dissemination fails or is weak,** combining the use of informal methods such as door-to-door communication, supporting intermediaries such as extension workers and humanitarian NGOs, and advancing "last-mile" dissemination technologies like leaflets dropped in remote flood zones through drones. Channels must adapt to different target groups such as those including hard-to-reach pastoralists and requires specific offerings for women such as female journalists.

4. **Expand easily understandable forecasts tailored to local conditions and languages to more users** by fostering—yet rarely applied—co-production, systematic feedback, and impact monitoring. Harnessing digital tools and AI for multi-language translation, visualisation and forecast customisation is crucial to reduce costs—a key constraint for scaling human needs-centred, highly applicable forecasts. Importantly, any communication strategy must recognise that even the best forecasts are worthless if they are unactionable or distrusted by users

5. **Empower Blue Nile actors to operate forecast systems and dissemination independently by prioritising long-term capabilities and African leadership,** especially at the local level, by investing in proven capacity-building initiatives, promoting highly scalable training for intermediaries such as train-the-trainer programmes, and by establishing a twinning programme pairing Ethiopian and Sudanese hydro-meteorological staff for joint forecast development, professional-relationship building and peer-to-peer learning to immediately address the brain drain.

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Policy Recommendations

6. **Improve institutional coordination and governance at all levels**, especially with local-level institutions, and on meteorological issues—existing cross-border cooperation focuses primarily on hydrological data—by establishing a basin-wide Early Warning Task Force, formalising a cross-border agreement that includes data-sharing protocols (especially for GERD), and creating a centralised data and visualisation platform for the Blue Nile, possibly hosted by ICPAC.

About this Policy Brief

This Policy Brief is part of the project SPS Blue Nile: A meteorological-hydrological forecasting system for the Blue Nile. SPS Blue Nile aims to enhance seamless forecasting and hydrological information services in the Blue Nile Basin, integrating short-range, sub-seasonal and seasonal outlooks to support climate-resilient agriculture, water resources management and disaster risk reduction.

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