CAN
CLIMATE ACTION NETWORK
Tanzania

FEB 2022

Policy Brief

PROMOTING THE INTEGRATION OF INDIGENOUS KNOWLEDGE:

The key to useable climate and weather information

Contact: contac@cantz.or.tz

This brief was developed by the Tanzanian Coalation for Climate Services (TCCS)

CAN
CLIMATE ACTION NETWORK
Tanzania

Policy Brief

FEB 2022

Promoting the integration of indigenous knowledge (IK)

The key to useable climate and weather information

SUMMARY

Key Messages:

- Complementing Climate and weather forecast information with **Indigenous Knowledge (IK) enhances downscaled climate services (CS) in Tanzania.**
- The current in **implementation of National Framework for Climate Services (NFCS) need to realize the role of Indigenous Knowledge (IK)** for enhancing Climate services in Tanzania.

Recommendations:

- The Government need to **mainstream IK into NFCS, sectoral policies and other frameworks,**
- Climate service actors need to **integrate IK for enhanced CS** by establishing IK forecast groups, consensus-based forecasts, and local climate information flow systems.
- Effective realization of IK in CS provision needs a wide range of **stakeholder's involvement** such as CSOs, academia, NGOs, FBOs, private sectors, research and institutions

INTRODUCTION

Climate Services are needed to increase Climate Resilience.

The risk of climate variability and change threatens the Tanzanian economy. In specific the livelihood of smallholder, as farmers, fishers and pastoralists, is highly vulnerable to changing weather patterns (IPCC Trisos et al. 2022). Therefore, smallholders need the *best available knowledge* as reliable climate information basis for decision-making on their livelihood activities. The implementation of the National Framework for Climate Services (NFCS) in Tanzania aims to provide *"accurate, reliable and timely (..)climate information in a cost-effective and sustainable manner*." (NFCS,2018)

Key challenge: downscaled and useable forecasts

The implementation of the NFCS is facing two interconnected key challenges. The first challenge is providing **downscaled forecasts** for smallholders. Smallholders needs forecast downscaled to a local level and on different temporal scales (seasonal, decadal, daily) to make smart adaptive decision (Kijazi 2021). Additionally Climate Services (CS) has to be perceived as **useable for decision-making** by smallholders in order to be used and utilized. Beyond providing relevant/*salient* information this also requires that the climate information are recognized as *credible* and *legitimate* (Daly 2019).

The integration of indigenous knowledge (IK) into Climate Services (CS) is key to get downscaled and useable forecasts.

INTRODUCTION: DOWNSCALED & USEABLE CLIMATE INFORMATION

Downscaled:
Knowing the local weather

The NFCS recognizes the need for downscaled climate information (NFCS 2018). Additionally the NCCRS aims for downscaling 70 % of the forecast by 2026 to District levels (NCCRS 2021). One of the lessons-learned identified from the implementation of the Global Framework for Climate Services (GFCS) in Tanzania is that the integration of IK with scientific forecast will enhance local specific climate information. (Kijazi 2021).

The main causes of weather forecast inaccuracy are shortage of weather data, few weather station and poor maintenance (Irumva 2021). To overcome this shortcoming IK is a valuable source of local weather data. Indigenous Knowledge provides a deep understanding of local microclimates and can be therefore utilized for downscaled climate and weather information (LINKS 2018, Radeny 2019). This make makes the CS more accurate and relevant (salient) for smallholder's decision-making.

Nonetheless investment and effort is needed to strengthen weather & climate data collection (e.g. increase & digitalization of weather station network) (NFCS 2018,Irumva 2021). Strengthen science-based weather data collection in combination with IK can bridge the climate knowledge gaps on local level.

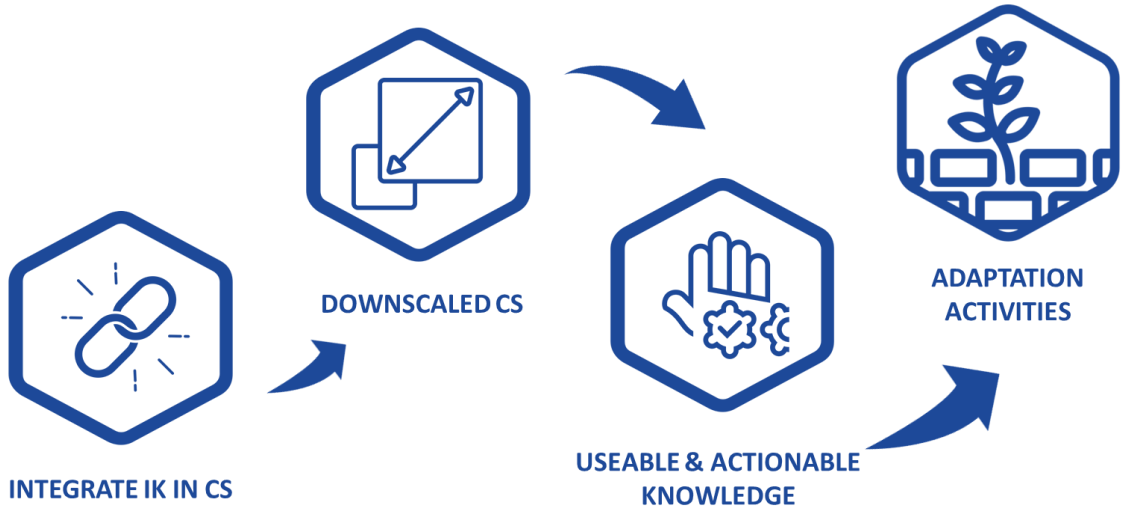
Useable:
Trusting the climate information

For information to be perceived as useable and actionable the have to be (Delay 2019):

credible (i.e., valid, trust-worthy, sufficient evidence)

salient (i.e., relevant, important relative to other sources of knowledge),

legitimate (i.e., inclusive and fair processes, transparent and unbiased, respectful of divergent values and beliefs)



The NFCS focus currently strongly on increasing the saliency of provided CS. This leaves a gap and the need to address credibility and legitimacy of disseminated climate information's.

Research proved that 80 % of farmers and pastoralists relay on indigenous knowledge for their farm decisions. (Kijazi 2021). Trust issues and a lack of understanding of scientific forecast are still major barrier of uptake of CS by smallholders for decision making (Ochieng 2021). The integration of IK into CS can bridge this gap by integrating a locally trusted source of knowledge and strengthening the involvement of local stakeholders in the process of knowledge generation. (Plotz 2017, Radney 2018) The integration of IK helps to contextualize the disseminated information and make it easier to understand and interpret for smallholders, which can increase the uptake and utilization.

Policy Brief Feb 2022; contact@cantz.or.tz

INDIGENOUS KNOWLEDGE & CLIMATE SERVICES

How the integration of indigenous knowledge (IK) can address key challenges of CS

Integrating IK into CS can bridge the gap to useable and downscaled Climate information (Kijazi 2021,Irmuva 2021). Many members of local Tanzanian communities' trust and relay on IK-based forecasts for decision-making, therefore the integration of IK in CS holds the potential to raise the *credibility* and *legitimacy* of the disseminated CS (Daly 2019). Downscaling of forecast remains challenging due to the lack of weather stations and (historical) weather data on a local level (NFCS 2018). The knowledge of indigenous forecasts is based on a long tradition of local nature observation. Therefore IK-knowledge holders have a huge treasure of insights from historical long-term observations into local micro-climate. Therefore, the integration of IK in CS opens they door for locally downscaled relevant CS (LINKS 2018).

In addition, there is existence of danger to loss of IK as remain non documented from one generation to another, and further more highly displaced by the growing modern weather forecast technologies

Recognizing the value of indigenous knowledge

The Paris Agreement (Art 7.5) acknowledge that adaptation to the impacts of climate change should use the *best available knowledge* – integrating local and indigenous knowledge (Paris,2015). Tanzania started to mainstream IK into core national strategies to adapt and response to climate change (NAPA 2007, NCCRS 2021, NDC 2021). The National Climate Change Response Strategy focus plans to "**promote and enhance dissemination and use"** of integrated CS. It aims for Tanzania to gain "at least **30 % of the conventional weather forecasts and that of indigenous knowledge inform each other by 2026**" (NCCRS 2021).

BEST PRATICE & LESSONS LEARNT : INTIGRATING IK IN TATANZANIA

Multiple stakeholders tested different approaches of integration of IK into CS in Tanzania. These best practices and their lessons-learnt should inform policies on CS and the implementation of the NFCS.

Best practices

IK weather forecasting groups: The *Developed District Climate Financing Project* (DCF project) partnered with TMA on integrating IK into CS in three project districts. They established IK *weather forecasting groups* informing TMA on their information (Delay 2019). Alongside extensive exploration and engagement of local communities were elementary for a meaningful integration of IK into CS(e.g. by participatory resource mapping).

Consensus forecasts and Co-Production: During the implementation of the *Global Frame for Climate Services (GFCS)* in pilot districts in Lushoto in Tanzania, the Tanzanian Meteorology Authority (TMA) cooperated successfully with local IK forecasters. Three local IK forecasting groups were established. A *consensus forecast* was drafted out of the IK-based and scientific forecasts. Beyond establishing a *local climate information flow system,* activating key stakeholders (e.g. churches, women groups, markets), ensured improvement of CS uptake (Mahoo 2015).

Indigenous Knowledge is a valuable resource for adaptation in Tanzania.

Lessons learnt

Bottom-up: IK is highly diverse and embedded in complex local contexts. Therefore, a successful integration benefits form a bottom-up approach. The cooperation and co-production should emphasize the need of local communities and engage them form an early stage (Ochieng 2021).

Address power imbalance: During co-production a power imbalance between the institutionalized scientific knowledge represented by national authorities and local IK knowledge holders is often observed (Mbah 2021, Theodory 2021). Addressing these issues is elementary for a balanced partnership which values IK. Therefore two-ways-communication channels should be established and value – free framing for science-based and indigenous knowledge should be used.

GAPS & CHALLENGES

Beyond reviewing best practices and lessons-learnt for an improved integration of IK in CS the challenge and gaps hindering a successful integration have to be reflected and addressed. The conservation and transition of IK is threatened by various factors. Strategies and planning for integration of IK in CS have to address these challenges to preserve IK for adaptation.

IK transmission to young generation: IK used to be passed on mainly orally and by storytelling. The knowledge transfer is interfered by various factors:

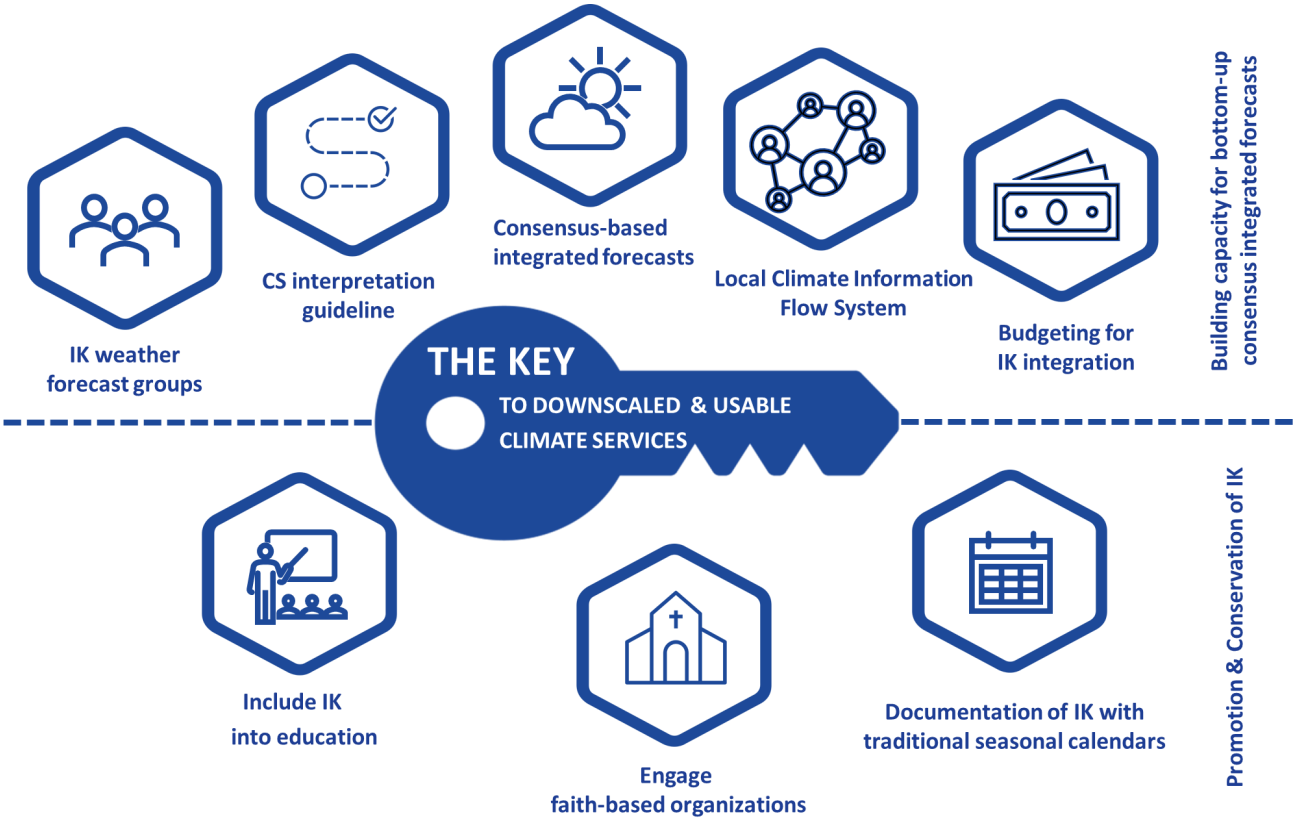
Scientific knowledge is perceived as superiority to IK (Theodory 2021)

Rural-urban migration, loosen social bonds to pass on IK (Ochieng 2021)

IK is **associated** by some churches **to witchcraft** (Mbah 2021)

Disappearance of flora and fauna indicators: IK forecasting is based on observation of change and behaviour of flora and fauna. Due to climate change, deforestation, and other factors the loss of biodiversity threatens the foundation of IK forecasting (Eliah 2014, Mbah 2021)

RECOMMENDATIONS



To use and preserve the potential of IK for integrated, downscaled, and useable Climate Information the way-forward for CS in Tanzania should built on two pillars:

Promotion and Conservation of IK:

- Including IK into the curriculum of the education system
- Engaging faith-based organisation to discard negative association of IK with witchcraft practices
- Identify IK knowledge holders in communities
- Funding the transmission and documentation of IK with traditional seasonal calendars.

Building capacity for bottom-up consensus integrated forecasts:

- Mainstreaming IK into national frameworks on adaptations & *budgeting* of IK integration in District Agriculture Development Plan (Mahoo 2015)
- Develop a climate service *interpretation guideline* informed by IK (Radeny 2019, Mahoo 2015)
- Establish bottom-up IK *weather forecast groups* in local communities
- Develop and implement consensus-based integrated forecasts
- Establish local *climate information flow systems* (Mahoo 2015)

Policy Brief Feb 2022; contact@cantz.or.tz

REFERENCES

Daly, M., Dilling, L. (2019) The politics of "usable" knowledge: examining the development of climate services in Tanzania. *Climatic Change* **157,** 61–80 https://doi.org/10.1007/s10584-019-02510-w

Elia, E.F et al. (2014) Indigenous Knowledge use in seasonal weather forecasting in Tanzania: The case of semi-arid central Tanzania. *S. Afr. J. Libr. Inf. Sci.* **80**, 18.

https://doi.org/10.1007/s10584-019-02510-w

Irumva, O. et al. (2021). The Need of Incorporating Indigenous Knowledge Systems into Modern Weather Forecasting Methods. *Journal of Geoscience and Environment Protection*, **9**, 55-70. https://doi.org/10.4236/gep.2021.92004

Kijazi, A.L., Chang'a et al. (2021) Best Practices and Lessons Learned in the Implementation of Global Framework for Climate Services—Adaptation Programme in Africa: Tanzania-Experience. *Atmospheric and Climate Sciences,* **11**, 749-766. https://doi.org/10.4236/acs.2021.114044

LINKS (2018) Climate Policy Brief 3: Indigenous and local knowledge in adaptation policies, UNESCO https://unesdoc.unesco.org/ark:/48223/pf0000366830

Mahoo H et al. (2015) Integrating Indigenous Knowledge with Scientific Seasonal Forecasts for Climate Risk Management in Lushoto District in Tanzania. CCAFS Working Paper no. 103. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

Mbah, M. et al. (2021) Systematic Review of the Deployment of Indigenous Knowledge Systems towards Climate Change Adaptation in Developing World Contexts: Implications for Climate Change Education. *Sustainability* ,**13**, 4811. https://doi.org/10.3390/su13094811

NAPA (2007) National Adaptation Programme of Action, United Republic of Tanzania (URT)

NCCRS (2021), National Climate Change Response Strategy, URT

NDC (2021), Nationally determined contribution (NDC), URT

NFCS (2018) , National Framework for Climate Services 2018-2025 (NFCS), URT

Ochieng, Richard et al. (2021). Living with Climate Change in ASALs: Integrating Scientific Forecasts with Indigenous Knowledge. https://doi.org/10.1007/978-3-030-22759-3_240-1

Paris (2015), Paris Agreement, UNFCCC

Plotz, R. D. et al. (2017). The Best of Both Worlds: A Decision-Making Framework for Combining Traditional and Contemporary Forecast Systems, *Journal of Applied Meteorology and Climatology*, ***56***(8), 2377-2392. from https://journals.ametsoc.org/view/journals/apme/56/8/jamc-d-17-0012.1.xml

Radeny *et al.* (2019) Indigenous knowledge for seasonal weather and climate forecasting across East Africa. *Climatic Change* **156,** 509–526 https://doi.org/10.1007/s10584-019-02476-9

Theobald Frank Theodory (2020): Understanding the relevance of indigenous knowledge on climate change adaptation among mixed farmers in the Ngono River Basin, Tanzania, *African Journal of Science, Technology, Innovation and Development*,**13**,51-59. DOI: https://doi.org/10.1080/20421338.2020.1816615

Trisos, C.H et al. (2022), IPCC report chapter 9 Africa. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change