WISER
Weather and Climate Information Services for Africa

Guide

Co-production of Prototype Climate Services

Introduction

This guide has been developed following completion of the Strengthening Climate Information Partnerships – East Africa (SCIPEA) project. The purpose of the SCIPEA project was to strengthen climate partnerships on three levels. Enhancing links and data exchanges between global, regional and national climate organisations was a core part of the project, with the aim of strengthening resources and tools for seasonal forecasts. In addition, the project facilitated the co-production of tailored services with climate information providers and users.

This guide looks at this element of the project, providing SCIPEA case study examples of the co-production of Prototype Climate Services (PCSs) to illustrate how this could be used elsewhere.

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SCIPEA consortia

There were a number of partners involved in the SCIPEA project including the Met Office (one of the World Meteorological Organization's designated Global Producing Centres (GPCs) for long range forecasts), the International Research Institute for Climate and Society (IRI), the IGAD (Intergovernmental Authority on Development) Climate Prediction and Applications Centre (ICPAC), and the national meteorological and hydrological services (NMHSs) of Ethiopia (National Meteorological Agency - NMA), Kenya (Kenya Meteorological Department - KMD), Tanzania (Tanzania Meteorological Agency - TMA) and Uganda (Uganda National Meteorological Authority - UNMA). ICPAC, NMA, KMD, TMA and UNMA each led a consortium of organisations which included two user organisations per group.

Consortia:

- **ICPAC**, Network of Climate Journalists of the Greater Horn of Africa (NECJOGHA), the Regional Food Security and Nutrition Working Group (FSNWG), University of Nairobi
- **KMD**, KenGen, Kenya Red Cross Society, Institute for Meteorological Training and Research (IMTR)
- **UNMA**, Ministry of Agriculture Animal Industry and Fisheries (MAAIF), Uganda Ministry of Water & Environment (MWE), National Meteorological Training School-Entebbe (NMTS)
- **NMA**, National Disaster Risk Management Commission (NDRMC), Ministry of Agriculture and National Resources (MoA&NR), Adama Science and Technology University (ASTU)
- **TMA**, Dar Es Salaam Institute of Technology (DIT), Ministry of Agriculture, Livestock and Fisheries (MALF), Ministry of Energy and Minerals (MEM)

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Service development teams (SDTs)

Each consortium, led by the climate provider, was tasked with co-producing a Prototype Climate Service (PCS) for each of its two users. To support the prototype development, SDTs were established by each consortium. The core SDTs from all consortia met at SCIPEA user forums and also convened separate meetings with other stakeholders including existing groups and taskforces already engaged with climate issues. Through this increased engagement, priority user requirements were established and prototype services delineated. Climate providers and users shared relevant data and went on to investigate generating the new forecast outputs required for the services.

Case study example
Service development for the Kenya Red Cross Society (KRCS)

KMD, KRCS HQ and IMTR held four SDT workshops to determine the priority KRCS requirements, exchange information on operational practices of the participant organisations and delineate components of a PCS. At one workshop stakeholders from KRCS county branches also participated to provide a perspective from the field.

The SDTs started an iterative approach. Firstly, the KRCS requirements for climate information were identified. Some aspects of the requirements were scientifically challenging, and led to project research by KMD to establish what can be viably provided. The KRCS requirements being investigated by KMD include the following:

- Season onset timing – nationwide including geographical variations
- Spatial distribution of rainfall across Kenya including amounts
- Impact information including linking rainfall thresholds with drought/flood interventions, and drought indices to help identify drought/flood hotspots
- Large scale climate context
- Historical information
- Link to KenGen product to enhance spillage warnings

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Information exchange and service testing

Other consortia also adopted an iterative approach. In some cases the approach sharpened in focus as exchanges of information and testing of the proposed services took place.

Case study example
Testing Kenya Red Cross Society (KRCS) Prototype Climate Service (PCS)

During the third KRCS SDT meeting towards the end of 2016, KRCS reported that drought was becoming serious in the Kilifi and Tana River counties and described their operational triggers for intervention and associated relief activities. Drought was occurring mainly where the March-May season had been poor as well as the then current Oct-Dec season. This led to a discussion about the need to capture the impact of accumulating rainfall deficits across consecutive seasons and the potential use of a predicted Standardised Precipitation Index (SPI) calculated over an extended (2-season) period as a proxy indicator of potential drought/flood hotspots. Thus the continued engagement resulted in the drought indices requirement coming to the fore.

During a one-month science visit to the Met Office, colleagues from KMD and IMTR researched the potential for making predictions of the 10-month March-December SPI from early October, using observed rainfall data from March to September and predicted rainfall for October to December (using GPC forecasts initialised in September). IRI's Climate Predictability Tool (CPT) includes a facility to generate such SPI forecasts.

Results were encouraging. The October-predicted SPI for March-December 2016 gives a high (>50%) probability of the SPI being below the 10th percentile (a threshold typically equated with moderate drought) – this is around 5 times the normal 10% chance. The areas with predicted heightened risk of drought (SPI < 10th percentile) matched the February analysis of food security-stressed regions generated by the FSNWG in the eastern and coastal districts of Kenya (though stressed regions in the northwest were not anticipated).

Predictions of SPI are not widely used currently and could be a useful component of the service to KRCS.

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Case study example
The NECJOGHA/ICPAC climate education and communication service

The Network of Climate Journalists of the Greater Horn of Africa (NECJOGHA) was one of the two user organisations in the regional SCIPEA consortium led by ICPAC. The selected prototype service developed by NECJOGHA and ICPAC was a climate education and communication initiative that included piloting downscaling to national level. The aim of the service is to provide journalists and NMHS communication officers with sufficient understanding of climate basics and skills for effective communication of climate information as well as an appreciation of how climate services can translate into actionable decisions and influence performance-critical sectors and users. The initiative is also pioneering a new regular Climate Café platform to disseminate seasonal forecasts and their updates.

Climate communications workshops
Two workshops were held which included exercises to identify barriers to gaining access to climate information, training on communication techniques and interaction with climate scientists.

Climate Cafés
Four "Climate Cafés" were held as a platform to bring together producers, communicators and users of climate information. These events were successful in strengthening communication of the high risk of below normal rainfall forecast for the OND 2016 season – with evidence of benefit to farmers. For example the following feedback was received from a fruit farmer in western Uganda. *"When I got the October, November, December seasonal forecast I had just planted 35 mango fruit trees. They are high value trees that I could not afford to lose. I immediately decided to start a simple watering can irrigation intervention in the morning and afternoons. I only lost 2 trees and 33 survived. In my sub county I am the only farmer who did not lose so much. Most of the colleagues did not save any trees"*.

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Case study example
Testing skill for Food Security and Nutrition Working Group (FSNWG) rolling forecasts

The operational schedule of monthly updates adhered to by the Global Producing Centres (GPCs) is well aligned with producing a rolling forecast. ICPAC have been developing calibrated GPC forecasts for the region with a 1-month lead each month, assessing the prediction skill and briefing FSNWG on the forecast signals. Up to six GPC models have been used.

Skill was variable with region and season, but good over the October-December season and adjacent months. Good guidance was provided to FSNWG over this extended period and **FSNWG reported that the rolling – monthly updated - forecasts allowed consistent messaging to governments and humanitarian partners that helped prevent worsening food security from developing to famine levels**.

The same capability for longer lead, rolling forecasts has been explored by NMHSs including as part of the monthly forecast analysis ("La Niña watch") reports prepared by climate provider and university/training centre partners.

Conclusion

Climate service requirements differ across regions, stakeholder groups and climate information users. Co-production should aim to ensure that climate service development initiatives move beyond a solely 'user needs assessment' approach, to a more comprehensive, continuous discussion between all relevant stakeholders. This recognises the range of processes and actors involved in developing decision-relevant services.

The diagram below illustrates the elements that need to be considered during the co-production process. It demonstrates how the process of co-production needs to be continual so that the impact of the service developed can be constantly refined to ensure it supports the decision-making of users.

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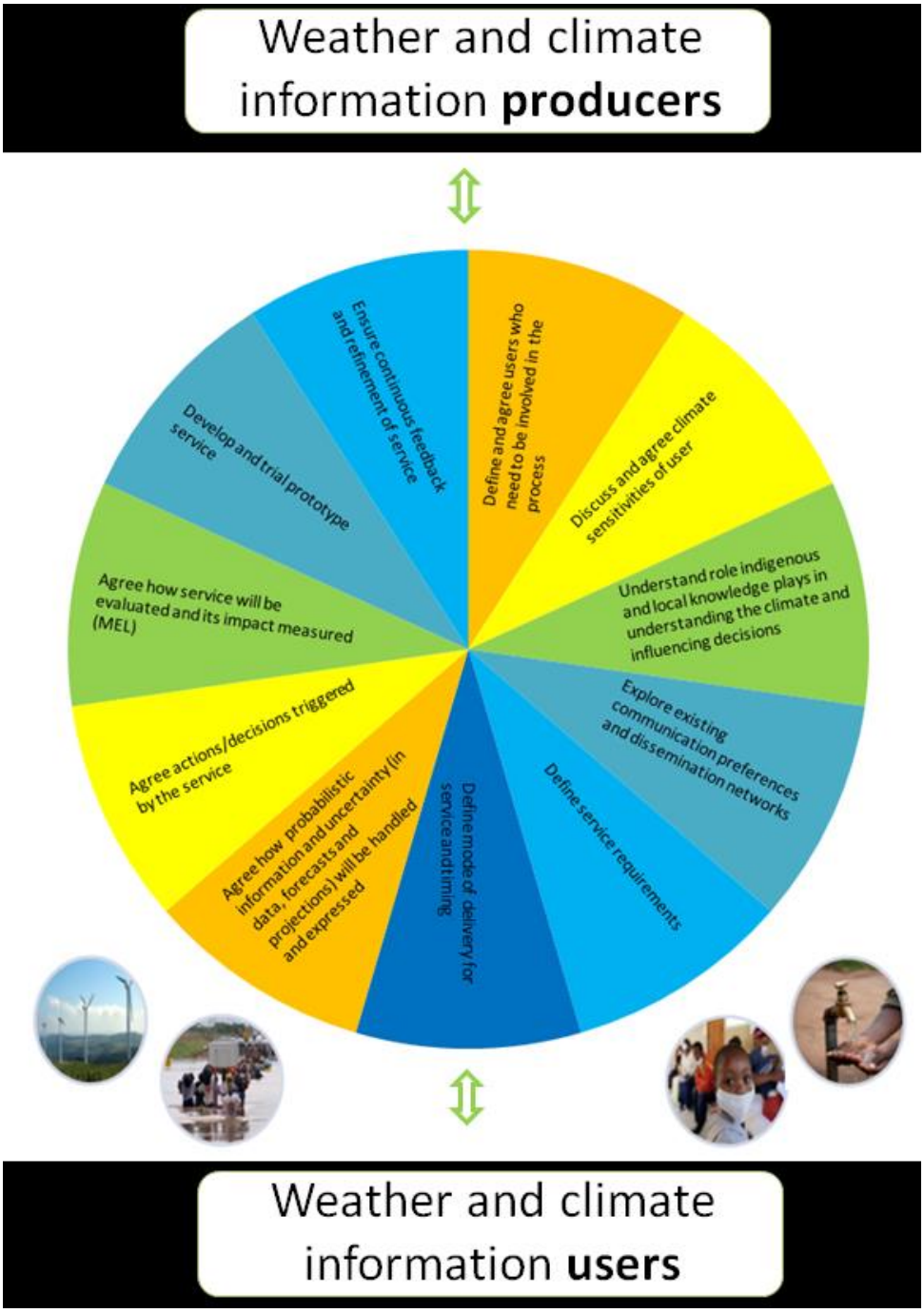

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