

Project Summary

WISER Support to ICPAC (W2-SIP)

Introduction

The purpose of the W2-SIP project was to enhance the resilience and prosperity of [ICPAC](#) member states by fostering climate services and knowledge. It aimed to increase the use of co-produced reliable weather and climate services to inform regional and national policy and decision-making. This project built on the successes of the [SCIPEA](#) and [ENACTS](#) projects supported in WISER phase 1.

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Improved data access and production systems through partnership development

The objective seasonal forecasting system introduced in 2019 and maintained and improved over 2 years has been a transformational organisational change to forecast production systems that utilizes GPC partnerships and benefits the regional NMHSs. It is a major paradigm change after over two decades of using the semi-subjective consensus approach still employed by many regional centres, and which is known to have some undesirable characteristics. The change is widely perceived to have improved the quality of forecasts for the GHA region. This in turn increases uptake of the forecast and thus potential for enhanced socio-economic benefits. The ready remote access to the system's forecast outputs by all 10 NMHSs through the High Performance Computing (HPC) facilities brings the benefits to all countries of the GHA.

The step-change brought about by the objective forecasting system, its delivery much earlier than planned (allowing proof of sustainability and demonstration of benefits within the project lifetime) are major achievements recognised by WMO. The 1-year training to maximise the utilisation and benefits to NMHSs is also innovative and required significant coordination and agreement with NMHS directors.

The most recent Data Library software is now available at ICPAC with updated GPC products. Data Library software at KMD has also been updated to the latest version. The country Data Library software are used mainly for creating the ENACTS maprooms. Additionally, IRI was able to update the daily data at KMD and UNMA for rainfall and temperature. IRI also provided support to ICPAC to start setting up their consolidated objective seasonal forecast in their Data Library

Improved co-production processes

The project undertook a Service Development Team (SDT) approach to co-production, developed and improved in partnership with the Kenya Meteorological Department (KMD), the Kenya Red Cross Society (KRCS), KenGen, ICPAC and the Network of Climate Journalists for the Greater Horn of Africa (NECJOGHA). For KRCS and KenGen the process led to the implementation of KMD climate service bulletins tailored to needs and issued for the OND seasons of 2019 and 2020 – demonstrating potential long-term sustainability. The services are also integrated into KenGen and KRCS operations through Standard Operating Procedures. The process brought increased interaction between KMD/KRCS/KenGen and this was considered a benefit

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in itself. The users gave positive feedback on the services and constructive lessons were learnt through application of this process, as well as in the WISER/FCFA and ICPAC coproduction guides. The climate information and education service with NECJOGHA was also successful, leading to two workshops for media journalists and NMHS communications officers. Coproduction here led to an innovative move to release the forecast to the workshop in advance of GHACOF – to allow joint preparation of media statements with the climate scientists. This early release of the forecast has now been adopted for all sectors in the new online GHACOF format.

Related to ENACTS, IRI provided a demonstration training of ICPAC's ENACTS maproom with focus on the Monitoring, Flexible Forecast, and Agriculture maprooms to 37 professionals from the agriculture and disaster risk reduction (DRR) sectors during GHACOF54 in January 2020. This included presentation of the ENACTS maproom, navigation of the ICPAC maproom and detailed discussions on the ICPAC's flexible forecast maproom.

In July 2019, IRI staff provided a 2-week training at ICPAC on the Data Library and Maprooms in order to bring ICPAC's capacity to a level that will allow them to take over the data library without support from IRI. While there, IRI staff member Remi Cousin took part in a co-production event with CARE and ICPAC. Remi participated on examples of co-production to past projects to four small groups of 20 people.

CARE engaged 25 institutions (8 producers, 14 users and 3 intermediaries/media) in co-production. The ICPAC Guide was drafted with 9 sectoral co-production processes in agriculture and food security, health, water & energy and disaster risk management. More than 270 producer and user institutions were trained.

Improved access and uptake of co-produced weather and climate products and services for decision making at regional and national levels

All three planned new co-produced climate services were delivered. This includes two customised services delivered by KMD to KenGen and KRCS for the OND 2019 and OND 2020, with expectation of sustained delivery after project close. Services are generated according to KMD Standard Operational Procedures (SOPs), which will assist sustainability. SOPs also guide the use of the services by KRCS and KenGen. The services are in the form of bulletins providing customised information, supplementary to that provided in KMD's national forecast. For KenGen this includes reservoir inflow information – used to assist national-level Hydro Power management. For KRCS this includes forecasts of extremes and site-specific information requested

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at Kenya vulnerability “hotspots”, used by the Disaster Management section in national-level contingency planning.

KRCS, KenGen, NECJOGHA, KMD, ICPAC and the Met Office have all contributed to learning events to share the coproduction and service development experience. Specifically a Peer Learning Event on coproduction (August 2019), two “Market Place” events at GHACOFs, presentations and side events at GHACOF54 and GHACOF57 and an international Climate Café led by NECJOGHA at GHACOF56.

The access and uptake of co-produced weather and climate products for decision making were reached through the: Karamoja Cluster downscaled seasonal climate workshop; institutions and organisations engaged in the co-production of climate services; member organisations of Food Security and Nutrition Working Group; and Participatory Scenario Planning workshops for seasonal climate outlooks carried out in Oromia region of Ethiopia, Taita Taveta County, Kenya and Ssembabule region of Uganda.

Objective monthly and seasonal forecasting system improved and operationalised over the Greater Horn of Africa (GHA)

Assistance has been provided (including limited review of code) to the continual development of the objective forecast system. This has included a comprehensive analysis of the prediction skill of 12 GPC models for the GHA region and all 11 countries has been conducted for all 3 seasons that are the subject of GHACOFs: MAM, JJAS and OND. These evaluations of skill have informed the GHACOF forecast process. They also provide criteria to formulate a potential revised objective system based on only the most skillful GPCs. The evaluation has included:

- Rigorous testing of the statistical significance of skill, as a basis for objective model selection
- Use of multiple skill measures: Correlation, Reliability, Relative Operating Characteristics, Brier Skill Scores
- Evaluation of multi-model combinations (as used in the objective procedure) as well as individual GPC models.
- The evaluation information has been used to inform the objective forecasting procedure at 6 GHACOFs
- A draft manuscript for submission to peer review

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Additionally, IRI provided training on PyCPT to ICPAC during the "Foundational Climate Prediction Training Workshop". PyCPT is a Python library that provides an interface and extra functionalities to IRI's Climate Predictability Tool (CPT), a widely used research and application Model Output Statistics/Prediction toolbox

Conclusion

ICPAC's move to an objective forecasting approach has been a huge leap forward, supporting the development of a new range of customised seasonal services delivered by NMHSs in the region. Allied to this, the project enabled stakeholders to become much better equipped at interpreting and using climate services, and promoted a shift in the thinking of climate information producers from the usual supply-driven to user-driven climate services through application of innovative co-production practices.

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