

TAMSAT: SATELLITE-BASED RAINFALL MONITORING HELPS AFRICAN FOOD SECURITY

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Summary

The lives and livelihoods of about 250 million people living in sub-Saharan Africa depend critically on rain-fed agriculture. Variability in rainfall and extreme weather events can have an enormous impact on the lives and livelihoods of these vulnerable communities, and yet Africa has the lowest density of rain gauges for any continent apart from Antarctica and operational rain radars do not exist in most areas. A satellite-based method for estimating rainfall over all of Africa developed at the University of Reading is helping inform and improve food security, humanitarian aid and agricultural and economic planning in several African countries.

Background

Monitoring rainfall to identify droughts or flood events that are likely to result in lower crop yields provides useful early warning of food shortage crises. University of Reading researchers developed remote sensing methods to monitor rainfall using satellite imagery. The method, Tropical Application of Meteorology using Satellite data and ground-based observations (TAMSAT), relates satellite imagery to ground-based rainfall observations to provide rainfall estimates at 4 km resolution on daily to seasonal timescales. TAMSAT's archive of precipitation climatologies, now extending back more than 30 years, allows rapid assessment of departures from normal rainfall at various timescales.

How is University of Reading research contributing?

TAMSAT has now been extended to cover the whole of the African continent, and in doing so, many African national meteorological services can both contribute to and use the data.

What impact has our research had?

Amongst its many impacts, TAMSAT helped establish sound weather-based index insurance (WII) schemes in Africa. Such schemes are designed to insure smallholder farmers against weather-related risks such as droughts and floods. Weather index-based insurance pays out if a certain weather index is breached. For example, if (satellite-based) rainfall data falls below a certain level for a certain amount of time, farmers who have purchased insurance in that region will receive payment without needing to file individual claims. WII helps farmers access credit from financial institutions and so improve their agricultural practices, such as purchasing higher quality seeds and appropriate fertilizers. This results in improved crop yields and food security, and a more resilient rural economy. As of early 2015, TAMSAT has helped insure more than 50,000 farmers in African countries through WII contracts. In addition to numerous other food security and humanitarian applications, the TAMSAT programme has also helped build the capacity of local meteorological services.



Photograph courtesy of Agrotosh Mookerjee

“The TAMSAT programme has had enormous impact in Ethiopia - for example, through the ENACTS platform. From its original conception in the early 1990s, we have seen the TAMSAT programme deliver additional benefits year on year, particularly in food security and humanitarian aid planning. TAMSAT excels in delivering this year’s cutting-edge science in the form of real, on-the-ground assistance to African farmers the very next season.” “

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Find out more...

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