THE CONTEXT

Droughts have a profound impact on livelihoods in Latin America, and have affected more than 60 million people over the last decades. A large part of the continent is dependent on rain-fed agriculture, which makes it particularly susceptible to climate variability and change.

Recurring drought conditions, as recently observed in Central America, Eastern Brazil and Central Chile, have had serious humanitarian impacts and impose significant reductions in GDP for countries whose economies are tied to agriculture. The prospect for continued drought impacts and water scarcity is made more worrisome due to expected impacts of climate change and increased population pressures.

Alleviating the impacts of drought across the region requires a transition from drought crisis management to drought risk management and reduction, including the development of national drought policies, increasing coping capacity and adapting to likely future changes at regional and local levels.

A key element in managing drought risk is the monitoring of current conditions and the provision of early warning of developing drought conditions and impacts. Such information can provide governments with the lead-time necessary to implement drought management policies and reduce impacts at all levels.

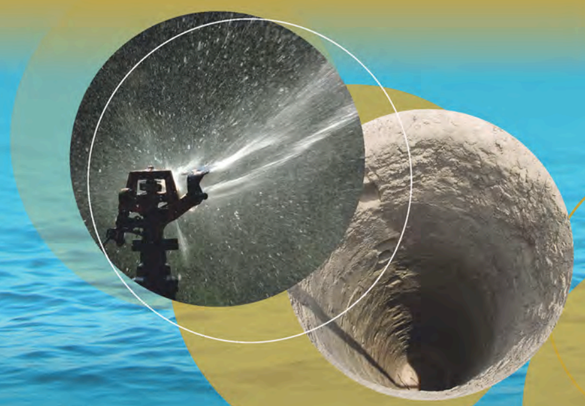
Given the negative impact of drought in the region where the growing population is mostly dependent on rain-fed agriculture, the implementation of such a system is a key step forward in reducing the vulnerability of livelihoods to drought conditions. It also promotes a pro-active approach that stimulates drought preparedness at all stakeholder levels.

NEXT STEPS

The implementation of this system is a key step forward in building capacity through technology and knowledge transfer and has the potential to reduce the impacts of drought across the region of Latin America and the Caribbean.

By combining observational networks with the modelling capacities of the Drought Monitor, valuable information can be provided in areas where observations are sparse or inadequate. Efforts are currently on-going to set up effective mechanisms of data exchange between national observations and the Monitor, to ensure the highest quality of monitoring and early warning of drought in the Region of Latin America and the Caribbean.

Additionally, there is a need to join efforts at an international level through different mechanisms, such as the Global Drought Monitor, and the International Drought Initiative (IDI) which provides information on drought activities at a global level and facilitates exchange of information between different research groups, institutions, media and the public. Streamlining these different information sources for drought management will provide a global platform for drought monitoring, while maintaining a direct interaction with national and local data sets for improved accuracy.



INTERNATIONAL HYDROLOGICAL PROGRAMME (IHP)

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International Hydrological Programme

LATIN AMERICAN DROUGHT MONITOR IHP-VIII

PRINCETON UNIVERSITY

Flanders State of the Art

ICIWaRM

CAZALAC

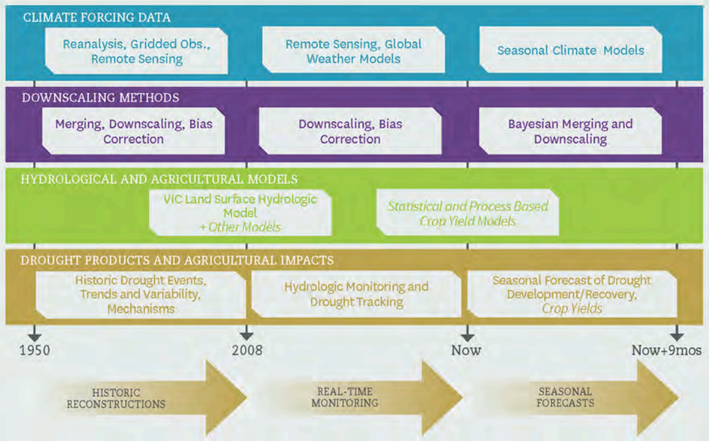
DROUGHT MONITORING AND PREDICTION

In collaboration with the International Hydrological Programme (IHP), Princeton University has developed an experimental drought monitoring and forecast system for Latin America and the Caribbean. The Drought Monitor is developed within the framework of IHP Phase-VIII (2014-2021) 'Water security: responses to local, regional and global challenges' and is a contribution to the Global Network on Water and Development Information for Arid Lands (G-WADI) and the International Drought Initiative (IDI) of IHP.

The Monitor merges climate predictions, hydrological models and remote sensing data to provide timely and useful information on drought in regions with limited access to information on current and expected drought conditions. Key elements of the system are the provision of near real-time evaluations of the terrestrial water cycle and an assessment of drought conditions.

Current approaches to drought monitoring in the region have generally been limited, in part because of insufficient monitoring networks and limited national observatories. Operational seasonal climate forecasts are also deficient and often reliant on statistical regressions, which are unable to provide detailed information relevant for drought assessment.

The wealth of data from satellites, real-time telemetry, and recent advancements in large scale hydrological modeling and seasonal climate model predictions have enabled the development of state-of-the-art monitoring and prediction systems that can help address many of the problems observed. Satellite remote sensing in particular is capable of overcoming differences in data availability across political boundaries that have historically hindered monitoring of regional phenomena such as droughts.



International Workshop 'Implementation of the Observatory for Latin America and the Caribbean ", Santiago, November 17-18, 2014.

WORKSHOPS:

KNOWLEDGE TRANSFER AND CAPACITY BUILDING

A key element in the development of the system is the technological transfer and testing of the technology for operational usage by Latin American and Caribbean partners. In November 2014 a workshop was held at UNESCO Santiago Office in Chile, to train professionals from 22 hydrometeorological services in the Region of Latin America and the Caribbean in the operational running of the system and interpretation of the data output.

A key outcome of the workshop was the need for detailed national calibration and validation of the drought monitor using national measurement stations, to ensure that drought monitoring and predictions align well with historical drought conditions. The quality of predictions is essential to ensure uptake by stakeholders and a validation and evaluation strategy has been developed to determine the accuracy of the system for tracking drought at local scales.

The continued and sustained use of the system depends on the mechanisms for updating and improving the system, as well as training local scientists in interpreting predictions. This requires mechanisms for sustained knowledge exchange and education, and eventual transfer of ownership into locally relevant systems, such as national drought observatories currently under development throughout the region.

THE LATIN AMERICAN DROUGHT MONITOR:

HOW IT WORKS

The Latin American Drought Monitor uses available satellite remote sensing and in-situ information, a hydrologic modeling platform and a web-based user interface for operational and research use in Latin American and the Caribbean. The monitor, developed by Princeton University, is available in Spanish, Portuguese, English, French, Arabic and Chinese.

Based on macro-scale hydrologic modeling, the system ingests available data to provide real-time assessment of the water cycle and drought conditions, and puts this in the context of the long-term record dating back to 1950.

The data, made available online for drought research and operational use, complements in-situ drought assessments.

Hydrological and drought forecasts are provided up to 6 months in advance. The predictive skill of the system has been evaluated for 30 years of historic hind casts and shows potential for providing useful forecasts of developing drought conditions, particularly for the first months.