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Recent Advances in Seasonal Forecasting in Southern Africa

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Climatic uncertainty posed by the looming possibility of unprecedented climatic change is presenting society with new challenges the world over. In recent years, demand for long-range seasonal to interannual climate forecasts has been on the rise as society grapples with climatic risk management in southern Africa. Although more investment is still required to bring weather services in the region to a level advanced enough to handle the emerging complex and economically justified user needs for climatic services and products, some commendable progress has already been made, particularly in providing seasonal forecasts in addition to the other traditional core services and products provided by weather centers.

The regional Drought Monitoring Centre for southern Africa based in Harare has put in place operational regional seasonal rainfall forecasting schemes that are largely driven by the El Niño–Southern Oscillation (ENSO) phenomenon, the Indian and Atlantic SST, and the regional pressure and wind anomaly fields at various levels. Matarira and Unganai (1994) produced an operational regional ENSO signal interpretation scheme that has been quite successful at predicting the 1994–95 drought and the nature of the 1995–96 rainy season in southern Africa. This empirical seasonal forecasting scheme uses an analogue approach and univariate linear regression models and is complemented by subjective interpretation of other regional scale factors such as the general tendency in pressure and wind anomaly fields. Figures 1a and 1b show the analogue scheme, which relies mainly on the Southern Oscillation Index (SOI), as applied to the 1994–95 and 1995–96 rainy season forecasts, respectively.

Recent advances in seasonal forecasting work include the identification of a strong teleconnection between southern African and Ethiopian rainfall at a time lag of up to 4 months. The influence of the Quasi-Biennial Oscillation (QBO) on the region's rainfall has been remodeled, with early results showing that areas in the region that respond significantly to the QBO phase shift are localized. Northern Zambia, northern Malawi, and Tanzania rainfall showed the strongest response to the QBO. This latest research was carried out at DMC–Harare by L. Unganai (DMC–Harare), S. Nyambe (Zambia Met. Services) and J. L. Nkhokwe (Malawi Met. Services) while Nyambe and Nkhokwe were visiting scientists at the Centre from October 1995 to May 1996.

Impact of Seasonal Forecasting in Southern Africa

For seasonal forecasts to have an impact on society, they have to be fundamentally reliable, timely, well presented, and readily accessible. Reliability of the forecast helps to build user confidence in the product. It should also be underscored that for society to benefit from long-range forecasts, we must have coping resources and alternative management strategies, particularly in the event of a drought warning. As the seasonal to interannual climate forecasts continue to improve, users must learn how to take best advantage of the available climate information. In southern Africa, the impact of seasonal forecasts has been phenomenal, particularly in the large-scale communal farming sector, relief agencies, governments, and food security early warning systems. Obviously, the benefits of seasonal forecasts in the small-scale communal farming sector are potentially high, given this sector's high vulnerability to the vicissitudes in climate. However, for these benefits to be realized, we must address the issues of coping resources and alternative management strategies, timely communication, and breaking some of the myths common among some user groups.

Reference

Matarira, C. II; and L. Unganai. 1994. A seasonal forecasting model for southern Africa based on the Southern Oscillation phenomena. *Technical Handbook*, SADC/REWU, Harare, Zimbabwe.

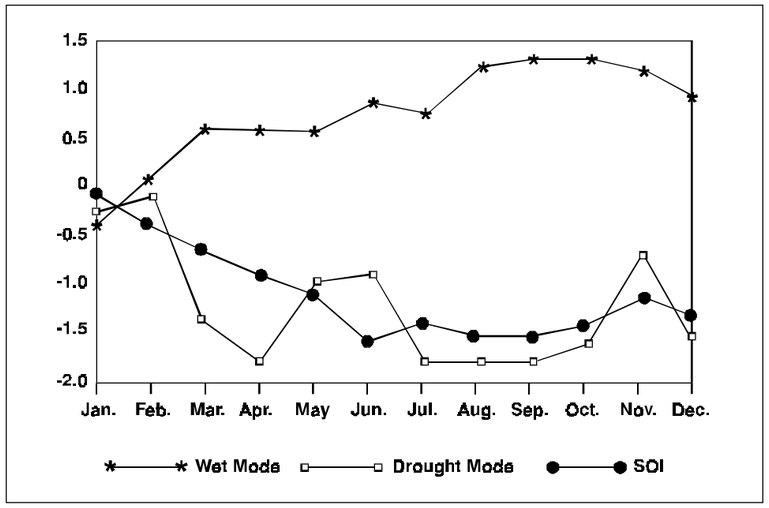

Figure 1a. With the 1994 SOI close to the empirical drought pattern, drought was predicted for the 1994–95 season by September, and it turned out to be a severe drought.

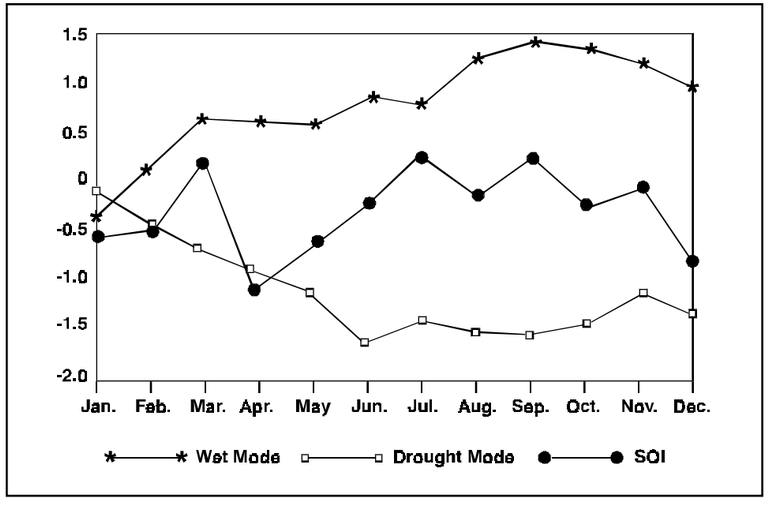

Figure 1b. With the 1995 SOI largely neutral, the possibility of the 1995–96 rainy season being dry was ruled out by September. The season turned out to be very wet, with pockets of deficits and poor temporal distribution in places.

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