

The use of seasonal forecasts in South Africa during the 1997/98 rainfall season

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Abstract

Forecasts can never be perfect, but with improved understanding of South Africa's climate systems, the ability to predict certain climate scenarios is increased. The South African Weather Bureau is obliged to forecast these different weather and climate scenarios, while government and the private sector have a role to play in advising the public, and farmers in particular. Since climate scenarios such as seasonal drought cannot be prevented, the farming community and other water sensitive sectors of society has to accept variability and adapt to it as a normal part of management. A wide range of measures is required in response to climate variation, such as the improvement of early warning systems and the co-operation between different private and public sectors.

During the 1997/98 rainfall season in South Africa, warnings of a strong El Niño event developing stimulated a great awareness and need for seasonal climate prediction by the public. As part of a strategy to be pro-active in planning and decision-making, the South African Weather Bureau issues seasonal outlooks through the Long-term Operational Group Information Centre (LOGIC) on a monthly basis to a large number of end-users in South Africa. The outlooks are distributed through fax, mail, the internet, e-mail and telephone. The Weather Bureau has a responsibility to ensure that this information is used to maximum benefit by their clients. Therefore, it is necessary to evaluate the use and understanding of this information by the end-user. A questionnaire was compiled and sent to end-users in order to determine how the information was absorbed by the end-user community, and what influence this information had on their planning processes during the 1997/98 summer rainfall season. Responses were received from a wide variety of sectors, including agriculture, water management, energy supply, construction, education and policy-making. It is evident from the results that users did change decisions because of the El Niño warnings during the 1997/98 rainfall season. The need for education and collaboration between different stakeholders in the user- and scientific communities is evident - users need more information on how to use and interpret the information, while forecasters need to assess what information the user actually needs, and what is the best way in presenting the information to the end-user. These issues need further attention. This paper summarises the responses to the questionnaire.

Introduction

Uncertainty about future climate conditions is an important retarding factor for decision-making in agriculture, food security and many other water sensitive sectors of the economy. It is the highly variable nature of rainfall over much of Southern Africa which enhances the potential use and value of reliable and dependable seasonal forecasts in the decision-making processes of different sectors. Recent droughts experienced in South Africa (e.g. 1991/92) have created greater awareness and recognition of the risks involved amongst decision-makers in both the private and public sectors, and stimulated a need for long-term investments in drought-mitigation measures. However, the knowledge that rainfall is so variable imparts considerable inertia on the implementation of such measures, which often require major shifts in policy and redirection of investments (Mjelde et al., 1996; Nicholls, 1996).

Since 1994 the South African Weather Bureau (SAWB) is actively involved in the research and development of seasonal climate predictions (Klopper et al., 1998; Landman and Mason, 1999; Tennant, 1999) with the aim to provide the best possible information on future climate conditions so that the risk in economic and social decisions are reduced. Although forecasts generally possess positive value over a broad spectrum of decision-making problems and forecast time ranges (Mjelde et al., 1996; 1997; Sonka et al., 1988), the actual use and value of seasonal forecasts depend on the nature and structuring of the individual

user's decision-making problems, on various characteristics of the information on which their decisions are based and on a variety of behavioural characteristics of the user. Climate information, even perfect forecasts, has limited value if it cannot be understood and used by the recipient to support the decision-making process (Glantz, 1977; Chagnon, 1992). Significant impediments on the use of forecasts that exist (Nicholls, 1996) include a lack of flexibility in both user's economic and decision-making models and in operational systems or practises to respond to improved information. Also, the impact of climate forecast information on profitability is only marginal compared to the impact of the variation of input costs, interest rates, market prices and other factors which may be outside the influence of the user. Users may have little belief in the accuracy of forecasts through personal experience, hearsay or bad publicity. Other constraints on the optimal use of climate forecast information includes factors such as the information provided is too general, non-specific to an area or particular application, received too late for use and is often too difficult for the user to interpret and apply.

The importance of user confidence for the application of climate forecasts emphasises the need for forecasts to be designed and developed with the requirements of the user very much in mind. Assessing the value of climate forecasts is fundamentally an interdisciplinary problem (Ehrendorfer and Murphy, 1992; Murphy, 1994), requiring expertise from such fields as economics, operations research, psychology, statistics and system analysis as well as climatology. Most studies of the value of forecasts have been conducted in the developed world (Lyakhov, 1994; Mason, 1996; Mjelde et al., 1988; 1997; Mosley, 1994; Nicholls, 1996). A clear need exists to extend these studies into the developing world where

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