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Socio-ecological influences on grazier uptake of seasonal climate forecasts on the rangelands in Australia

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Key words : climate variability, climate change, social science, adoption of new practices, decision-making, social resilience, resource dependency

Introduction Climate variability is the strongest driver of interannual variation in primary and secondary production in the rangelands and savannas and as a consequence has enormous socio-economic impact on rural livelihoods (Ash et al. 2007). Losses during drought periods can be extremely severe. In the face of climate variability, a key challenge facing graziers is to make appropriate management decisions so as to minimise losses in droughts and take advantage of favourable seasons, thus enhancing their resilience (Ash et al. 2000). One means of achieving this is through the use of seasonal forecasts. Yet, graziers are slow to uptake the technology. In this study, we aimed to identify the major socio-ecological differences between graziers that are interested or not in the uptake of technology such as seasonal climate forecasts. The potential influences that we focus on include social, economic and environmental resource dependency (Marshall et al. 2007), social resilience (Marshall and Marshall 2007) and perception of change events (Marshall 2007).

Materials and methods One-hundred graziers from the Upper Burdekin catchment in Queensland were interviewed in their homes. Interviews were based on structured surveys that aimed to quantify a grazier's (i) social relationship with the land in terms of attachment to the land and community, family dependency and employability, (ii) economic relationship with the land in terms of financial flexibility and business size, (iii) environmental relationship with the land in terms of current approaches to making decisions in the face of climate uncertainty, (iv) resilience to climate variability in terms of perception of risk, capacity to reorganise, ability to cope and interest in adapting to climate variability, and (v) perception of seasonal climate forecasts. The relationships between these socio-ecological descriptors of graziers and graziers' likely uptake of seasonal climate forecasts were investigated using correlative techniques to assess which factors were most influential in determining forecast uptake.

Results Results suggest that several aspects of a grazier's social, economic and environmental relationship with the land were significantly correlated with the likelihood that seasonal climate forecasts would be incorporated into grazier's decisions. Aspects of social resilience such as the capacity to learn and reorganise were also significantly correlated with uptake. Graziers saw SCF more as means of minimising losses in drought years and maximising opportunities in good years rather than for day-to-day stock handling. In addition, results showed that current scientific information is difficult to follow and the perception of seasonal climate forecasts could be improved in terms of how forecasts are presented, interpreted and valued.

Conclusions Our aim is to increase the adaptability of the grazier-grazing lands system to climate variability. Understanding how graziers prepare for climate variability each year and identifying the factors that influence their preparation can significantly assist in presenting seasonal climate forecasts to the grazing community in a way that ensures that they are interpreted and valued appropriately. In doing so, this research addresses the challenge of assisting graziers to prepare for climate variability through improving the useability of seasonal forecasts.

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