A partnered approach to sustainable land management practices: Integrating local knowledge and social and biophysical scientific models

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Farming practice is primarily an economic activity underpinned by experience, local understanding, landholders and communities' shared environmental knowledge and a set of beliefs, values and attitudes specific to individual landholders. Past experience has shown that best practice farm management as identified by Australian government agencies does not necessarily reflect landholders' views or intentions. Adoption of sustainable practices by farmers is often influenced by personal motivation, capacity, enthusiasm, and individual resources, interpretation of the social norm and positives attitudes and values toward change. Managing expectations of risk and availability of trusted sources of information have some influence on adoption of sustainable land management practices. Communication and education activities will not induce landholders to adopt practices and innovations unless the activities are seen as advancing the landholders' goals.

The research project developed and implemented by the social scientists in CSIRO Land and Water investigates dryland farming management in several catchments in New South Wales, a state in Australia, using a methodology that incorporates a partnered approach to changing farmers' land management behaviours towards more sustainable practices. Local knowledge is used in an iterative manner to inform biophysical and social models in support of the behavioural change process. Participatory approaches involve a series of consultations with farmers and government agencies to develop the survey design, from which structural equation modeling predicts the drivers of land management practices and behaviours. Interview data from farm-

ers and stakeholders provide a social network analysis of farming information flows around the catchment and identify key networks to involve in partnerships to maximise behavioural change initiatives. Biophysical models can then be used as illustrations of improvements gained from the targeted change practices and to negotiate perceived barriers with groups of farmers.

Throughout the project farmers and stakeholders engage in interviews, meetings, workshops and actively contribute to the development of the change program. Social learning theory and practice guides inter-agency collaboration and co-learning among stakeholders with divergent interests. Lessons drawn from research and development of land management approaches in Europe are used as guidelines to the development and implementation of the mutually agreed approach to sustainable land management practices. Collaborative learning provides an avenue for developing a fair and just method of public involvement providing social spaces for double-loop learning.

The research shows how participation by farmers and stakeholders can be integrated in an iterative manner to aid modeling exercises and positively inform the change process. While hierarchical management of shared resources is acknowledged, differences in knowledge, problem definition and environmental values and behaviours accommodate divergent perspectives on the purpose of the resource and the actions constituting "best land management practices".