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FROM CULTURE TO COOPERATION:

Insights from an Australian program of collaborative environmental governance

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Abstract

A collaborative vision for environmental governance in Australia—whereby collaboration among stakeholders in addressing problems supposedly leads them to cooperate more in implementing solutions—emerged in the 1980's. However, accomplishments to date in pursuit of this vision through the favoured organisational vehicle of integrated catchment management have mostly been disappointing. Moreover, the lack of a coherent theory of how collaboration increases cooperativeness has limited the learning that has arisen from the pursuit efforts that have been made. It is proposed in this paper that recent developments in the new-institutional theory of collective action can satisfy this need for theory. An overview of the relevant developments is presented before proceeding to explore how this theory accords with actual experiences within a particular case of collaborative environmental governance. The case involves the Land and Water Management Planning Program in NSW's central-Murray region (centred on Deniliquin) that has continued as a community-government partnership since its establishment in 1991. The applicability of the theory to this setting is explored through qualitative analysis of in-depth interviews with thirty key informants. In reporting the findings from the qualitative analysis, particular attention is paid to the effects of informal elements of local culture such as trust, leadership, social capital and social norms that the theory suggests are vital to explaining how collaborative problem-solving can foster cooperative implementation of solutions.

1. Collaborative environmental governance: Vision or delusion?

A new vision for environmental governance emerged in the mid-1980's. It was based on a belief that fostering collaboration between civil groups and government agencies in developing solutions to environmental problems leads them to cooperate more with one another in implementing the solutions that emerge. In this paper it is called the 'collaborative vision'. The vehicle most commonly used in Australia for pursuing this vision has been integrated catchment management (ICM).

Concerns are mounting that, after more than a decade of efforts to introduce the collaborative vision through ICM, the gap between the vision and its realisation remains wide. Tellingly, it has been rare for ICM strategies or plans developed in Australia to proceed to successful

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implementation (Bellamy *et al.* 2000). Australia has been far from alone in this respect (Born *et al.* 2001).

While Australian governments remain outwardly optimistic that pursuit of the collaborative vision through ICM programs will succeed subject to various administrative refinements occurring (e.g., Commonwealth of Australia (CoA) 1999; 2000), a growing number of commentators believe that success in this pursuit will remain elusive until cultural change occurs more systemically (e.g., Bellamy *et al.* 2000). A prominent concern relates to the perceived complacency with which leaders continue to address the task of learning how the vision might be realised more effectively.

In some quarters, these kinds of concerns have been used as evidence that the collaborative vision for environmental governance is flawed, particularly in respect of collaboration between governments and local communities. Indeed, Rhoades (2000 p. 330) observed that critics were starting to argue that a return to centralised governance "without the noise of participation" should be reconsidered. Nevertheless, such a conclusion seems premature given a considerable consensus that the thought and resources devoted to designing and applying collaborative approaches to environmental governance have not been sufficient to give them a fair chance of proving themselves (e.g., Bellamy *et al.* 1999; Margerum 1999). Although these approaches are predicated upon strengthening and harnessing the social dynamics believed to contribute towards groups cooperating more with one another, these commentators highlight that there has been little appreciation of the need to understand how this might actually be achieved.

Martin *et al.* (1992) explained this neglect in terms of a prevalent view among administrators in natural resource agencies that social knowledge is self-evident and does not justify the level of research devoted to technical problems. In turn, this view has been traced to a lingering materialistic bias in these agencies towards technical problems amenable to technical solutions (Woodhill 1997). This bias surfaces in judgements that social research is about 'human stuff' that is too much like 'common sense' to require 'real science'. The outcome of this bias against social research is, in the view of Rhoades (2000 p. 337), the "social underdesign" of collaborative ICM programs because "the very science we need most … —a solid social science—is the one seen as most dispensable".

There is an emerging consensus among social scientists that the appropriate way forward in obtaining the knowledge required to bring the collaborative vision to fruition is adaptive management. This strategy involves treating policy responses to complex problems as hypotheses to be tested and learned from (Dovers 2000). It aspires to scientific rigour at the same time as recognising the contingencies inherent in the natural and social systems to which it is applied. However, the literature on collaborative environmental management lacks a coherent theoretical framework from which the requisite hypotheses can be deduced and according to which (as it evolves) the knowledge that arises from testing them can be organised.

The purpose in this paper is to draw from developments in the economic theory of collective action to sketch what such a theoretical framework might contain, and then to explore how this sketch applies to a particular case of collaborative environmental governance. The case involves the Land and Water Management Planning (LWMP) Program that has been underway in the central-Murray region of New South Wales (NSW) since 1991. After outlining relevant developments in collective-action theory in section two, the geographical and historical setting of the case study is discussed in section three. The qualitative research method applied in the case study is described in section four, after which the findings are presented in section five. Finally, some concluding comments are offered in section six.

2. *Towards a theory of collaborative governance*

The seminal work for the economic theory of collective action is Mancur Olson's (1965) book *The Logic of Collective Action.* He was primarily concerned to repudiate the utopian understanding of collective action which he characterised as follows:

> [I]f the members of some group have a common interest or objective, it has been thought to follow logically that the individuals in the group would, if they were rational and self-interested, act to achieve that objective (ibid. p. 1).

Despite reasoning of this kind having become a "cherished foundation of modern democratic thought" (Ostrom 2000 p. 137), it stumbles on a fallacy of composition by overlooking the "externality inherent in all collective good situations, in that each individual's provision of any amount of a collective good would confer some benefit to others" (Olson's foreword to Sandler 1992 p. xiii). Olson (1965 p. 60) concluded as follows—in terms now characterised as "the zero contribution thesis" (Ostrom 2000 p. 137)—that this externality typically becomes so significant when a group grows large that individuals will no longer contribute towards provision unless incentives to do so are introduced from outside the group:

> If the members of a large group rationally seek to maximise their personal welfare, they will *not* act to advance their common or group objectives unless there is coercion to force them to do so, or unless some separate incentive, distinct from the achievement of the common or group interest, is offered to the members of the group individually on the condition that they help bear the costs or burdens involved in the achievement of the group objectives.

Olson (1965 p. 60) reasoned as follows that this logic is all the more powerful given that it presupposes that there is already perfect consensus within the group about what is wanted and how it should be achieved:

> [I]f voluntary, rational action cannot enable a large, latent group to organize for action to achieve its collective goals, even with perfect consensus, then *a fortiori* this conclusion should hold in the real world, where consensus is usually incomplete and often altogether absent.

This pessimistic prognosis for large-group collective action came to be reinforced by game theory's ubiquitous model of the Prisoner's Dilemma and by Garrett Hardin's (1968) well-known parable "The tragedy of the commons".

If the objective of promoting collaboration within environmental governance is limited to improving the likelihood of group members agreeing on how they each should act thenceforth, the implications of Olson's prognosis for the prospects of ever bringing the collaborative vision to fruition are profoundly discouraging. It suggests that "talk is cheap" and that it is simply not credible to expect any resulting agreements and commitments to have any affect whatsoever on group members' subsequent behaviour unless they are backed by externally-imposed sanctions. Indeed, it indicates that the vision is no more than a hallucination.

Nevertheless, Olson's neoclassical theory has been faulted on a number of counts. Firstly, it is contradicted by many everyday instances of large-group collective action. As Lichbach (1996 p. 6) remarked, there are "innumerable counterexamples to the dilemma of [large-group collective action]: people vote, interest groups exist, protest organizations form, and social movements organize ...". Secondly, the theory is logically incomplete. If large groups are unable to provide themselves with the organisational capacity required to achieve their collective goals, how can incentives be provided by external organisations? Such organisations, including governments, are themselves large-group collective goods. Hence proposing them as a solution to large-group collective action is only to relocate the theoretical problem to a deeper level.

The search for logically-complete explanations of real-world instances of spontaneous cooperation by members of large groups has led to significant progress in developing what Ostrom (1998) has called a 'second-generation' theoretical framework for analysing collective action. Runge (1981) contributed significantly to this progress by reasoning that communication possibilities mean that the equilibrium for large-group collective action is not necessarily zero provision or, in other words, mutual defection. He observed that communication among group members opens the possibility of them developing "endogenous responses" (e.g., self-organised norms or codified rules) to the problem of credibly assuring one another that they will reciprocate one another's cooperation (ibid. p. 601). The equilibrium level of cooperation would depend on the level of assurance, or trust, that communication is able to establish. However, this explanation remained incomplete because trust is a public good, so that organising to provide it entails a deeper problem of collective action.

Further progress was made by Ostrom (1998) who proposed on the basis of considerable evidence from 'laboratory experiments'—wherein people face simulated collective-action problems under controlled conditions—that the problem of establishing trust be cast as one in which trust, reciprocity and cooperation mutually reinforce each other through positive feedbacks. If some cooperation can get started, for instance by reciprocity among those group members who are related by kin, it was argued that trust might then grow organically in a 'virtuous circle' with reciprocity. The explanation goes like this: (i) initiation of cooperation by a few group members makes other members more trusting that cooperation by themselves would be reciprocated; (ii) some other members may then judge it in their interests to risk cooperating on the basis of reciprocity; (iii) this new increment of cooperation further increases mutual trust within the group, leading to a further augmentation of reciprocity and cooperation, and so on.

This explanation suggests that the challenge of large groups responding endogenously to their assurance problems is not as difficult as it first seems. A large part of the assurance needed to obtain cooperation in solving their most challenging collective-action problems may already exist due to prior successes in solving simpler problems. Nevertheless, the collective-action problem of providing the feedback or communication needed to fuel the organic growth of trust and cooperation remains. Hence this explanation also falls short as a logically-complete account of how large-group cooperation becomes possible.

It seems indeed that infinite regress is the inevitable destination of attempts to explain large-group collective action beginning with the assumption that human reasoning is always completely conscious. Consequently, collective-action theorists (e.g., Ostrom 1998; 2000) have turned their attention increasingly to the validity of this assumption. Their starting point was an older tradition in economics and psychology acknowledging that human rationality is bounded by cognitive constraints (e.g., Simon 1955). In this view, people are incapable of solving complex problems optimally even if they have complete information. Thus March *et al.* (1958 p. 11) described a human being as "a choosing, decision-making, problem-solving organism that can do only one or a few things at a time, and that can attend to only a small part of the information recorded in its memory and presented by the environment".

It is argued in this 'bounded-rationality' tradition that individuals adapt culturally to these cognitive constraints by learning mental models that tend to give them good outcomes in particular types of decision problems. Denzau *et al.* (1994 p. 4) defined mental models as "the internal representations that individual cognitive systems create to interpret the environment …". It is proposed further that individuals deduce heuristics from these mental models which guide their day-to-day decisions. When group members find themselves

following roughly the same heuristic, a social norm may "result from (and crystallize) the gradual emergence of a consensus" (Posner *et al.* 1999 p. 370). A social norm is a shared understanding about actions that are obligatory, permitted or forbidden (Crawford *et al.* 1995). Mental models, heuristics and social norms are key aspects of culture, which "provides a language-based conceptual framework for encoding and interpreting the information that the senses are presenting to the brain" (North 1990 p. 37).

With types of problems that are encountered repeatedly and fairly frequently it is possible for individuals to steadily learn heuristics and norms that give them progressively better outcomes (Ostrom 1998). However, this takes time and does not necessarily, or even usually, result in decisions approximating those that individuals without cognitive constraints would make (Rutherford 1996). Attempts to explain the use of heuristics as the outcome of conscious reasoning have been met by the objection that calculating the self-interest maximising heuristic is itself a complex decision requiring costly information. Hence explanations of this kind are beset by infinite regress too. Accordingly, it is necessary to accept that it is rational for individuals to set an arbitrary limit on the range of possibilities explored, and thereby to 'satisfice' rather than maximise self interest (Winter 1964). If not by conscious calculation, by what mechanism do individuals satisfice? Elster (1998) proposed, referring to the passage following, that people make the jump from calculating to satisficing when required by drawing on their emotions:

> [The] role of emotion is to supply the insufficiency of reason ... For a variable but always limited time, an emotion limits the range of information that an organism will take into account, the inferences actually drawn from a potential infinity, and the set of live options from which it will choose (de Sousa 1988 p. 224).

This view is consonant with emerging knowledge of how the human brain has evolved biologically. For instance, the biologist Edward O. Wilson (1999 p. 116) has written that:

> The human brain bears the stamp of 400 million years of trial and error … In the final step the brain was catapulted to a radically new level, equipped for language and culture. Because of its ancient pedigree, however, it could not be planted like a new computer into an empty cranial space. The old brain had been planted there as a vehicle of instinct, and remained vital from one heartbeat to the next as new parts were added. The new brain had to be jury-rigged in steps within and around the old brain. Otherwise the organism could not have survived generation by generation. The result was human nature animated with animal craftiness and emotion, combining the passion of politics and art with rationality, to create a new instrument of survival.

Hence: "Emotion is not just a perturbation of reason but a vital part of it" (ibid.). Emotions are triggered by beliefs (Elster 1998). Hence the more something is believed—that is, it accords with what one's mental model predicts will happen in that context—the more emotionally will it tend to be expressed or followed.

Frank (1990) hypothesised consistently with this proposition that emotions have evolved to allow individuals escape the infinite regress that confronts them in assurance problems if they perceive each other to be dispassionate calculators. In other words, emotions have arisen because commitments (e.g., promises or threats) that would not be credible if communicated by individuals expected to maximise their self interest *can* be credible if made by individuals expected—because of the emotions they have expressed—to place such commitments above what fully-conscious calculation would recommend. Indeed, there is increasing empirical evidence in support of this hypothesis

For instance, Fehr *et al.* (1998) concluded that accumulated evidence from 'laboratory experiments'—namely, a large fraction of people are willing to pay for rewarding cooperation and punishing defection despite the collective-good outcomes of such behaviour—is most plausibly explained by humans having inherited an emotional

predisposition to interpret deviations from reciprocity as hostile acts that deserve to be punished, and indeed that this resentment can be convincing enough to make threats credible. Based on other experiments conducted by Cosmides *et al.* (1992), Wilson (1999 p. 190) concluded similarly that:

> More than error, more than good deeds, and more even than the margin of profit, the possibility of cheating by others attracts attention. It excites emotion and serves as the principal source of hostile gossip and moralistic aggression by which the integrity of the political economy is maintained.

Moreover, humans have evolved to enjoy the social interaction required to provide themselves with the feedback they need to establish trust in one another. Wilson (ibid. p. 190) observed accordingly that because the human brain "is a stone-age organ … only recently thrust into the alien environment of industrialized society" it remains commonplace for individuals to exhibit preliterate traits including "prone to use language for social interaction rather than as a conceptual tool …" (ibid. p. 230). The following passage from Jacobs (1992/1961 p. 56) vividly illustrates the significance of this instinct for the human capacity to act collectively:

> The trust of a city street is formed over time from many, many little sidewalk contacts. It grows out of people stopping by at the bar for a beer, getting advice from the grocer and giving advice to the newsstand man, comparing opinions with other customers at the bakery and nodding hello to the two boys drinking pop on the stoop … Most of it is ostensibly utterly trivial but the sum is not trivial at all. The sum of such casual, public contact at a local level … is a feeling for the public identity of people, a web of public respect and trust, and a resource in time of personal or neighborhood need.

It seems that a further aspect of human nature helping us to make credible commitments to one another is a tendency to identify emotionally, or establish 'group identity', with people with whom we have interacted personally. Frank (1988 p. 224) alluded to this phenomenon as follows:

> To cheat a stranger and to cheat someone you have met personally amount to precisely the same thing in rational terms. Yet in emotional terms, they are clearly very different. Face-to-face discussion, even if not directly relevant to the game itself, transforms the other players from mere strangers into real people.

Thus Gächter *et al.* (1999) found from laboratory experiments that opportunities to express social approval had an insignificant effect on cooperation when players previously had been complete strangers. However, they found that if the players had some minimal social familiarity with each other, these opportunities resulted in strong increases in cooperation levels.

Despite the validity of Olson's (1965) argument that group members agreeing to cooperate is not sufficient to ensure they will do so, a high level of agreement is clearly necessary. However, Arrow's (1951) so-called impossibility theorem has left mainstream economists sceptical too regarding the prospects of groups reaching agreement consistently with these economists' interpretation of democracy. This scepticism follows from the theorem predicting that members will be unable to agree to a common preference ranking without the decision process being manipulated paternalistically.

Nevertheless, Sen (1995) has pointed out that this assumes group members' preference orderings are fixed, or at least that attempts to change them must be paternalistic. He argued that communication makes it possible for group members to compare one another's preference orderings, which in turn opens up possibilities of 'changing one another's minds' (i.e., mental models) in order to dissolve differences obstructing agreement on a common preference ordering. He observed that comparisons of this kind are part and parcel of practical policy making, even if they are "rough and ready and open to disputation" (ibid. p. 8). Moreover, he argued as follows that this disputation is often essential: "Many of the

exacting problems of the contemporary world—varying from famine prevention to environmental preservation—actually call for value formation through public discussion" (ibid. p. 18). Boulding (1970 p. 118) argued in a similar vein that quarantining people's learning of preference from disputation would be "absurd". For Sen (1995) and Norton *et al.* (1998) disputation of this kind is democratic provided it proceeds according to democratically-devised rules. For Norton *et al.* (ibid. p. 200) this would entail:

> … pointing out to people the consequences of their desires, and showing them alternative paths to personal satisfaction that have less severe impacts on the future of society.

The role of emotions in democratic deliberation over beliefs and preferences is highlighted by the following comment from O'Connor (2000 p. 5, original emphasis):

> It is precisely the fluid, unfinished, ambiguous process of inter-subjective communication, *with its impassioned, affective and non-rational as well as rational dimensions*, that permits the emergence of novel perspectives of coexistence and compromise.

Nevertheless, the preparedness of individuals to become emotionally engaged in a deliberative process depends on their trust that their beliefs and opinions will be respected even if they are disputed. Hoggett *et al.* (2000 p. 360) commented accordingly that:

> When people engage in social action they need to be able to bring their emotions with them … Democracy has to be convivial … [C]onviviality builds trust that in turn enables the expression of differences, often in playful or ritualized ways which enable aggression to be harnessed constructively.

Moreover, the power of exchanges of beliefs and opinions to effect preference changes depends on the extent to which there is an emotional bond, in the form of group identity or mutual caring, among the individuals involved (Schmid 2000).

Leadership would seem to have a vital role to play in this kind of deliberative process. It is distinct from authority since following a leader is a voluntary, rather than coerced, activity of the followers (Hermalin 1998). Wallis *et al.* (1995 p. 41) have proposed that the essential function of leaders is to facilitate "the convergence of the hopes of their followers into a 'vision' which they can share in common". Hope is a powerful human emotion, and it is triggered by a "person's image of what his or her own life, and the community in which this life is situated, could become" through participating in a collective quest (ibid. p. 39). This image or belief, and the emotions it evokes, allows individuals to savour in advance the provision of a collective good. In this way it offers them added impetus to revise their preferences to ones motivating behaviour more conducive to that provision.

This role of leadership can be particularly crucial given the tendency of preferences and the mental models underpinning them (as well as other aspects of culture) to 'lock in' as a result of path dependency. Given the need for humans to satisfice when making cultural choices at any juncture, making the best choice at the outset is unlikely. However, choices of mental models and preferences once made affect future actions and thus learning opportunities. They affect, too, what is learned from those opportunities. Moreover, they lead to 'network externalities' as others adapt to these choices and one adapts in turn to their choices.

North (1990 p. 99) explained how path dependency leads cultural choices to lock in as follows: "Once a development path is set on a particular course, the network externalities, the learning process of organizations, and the historically-derived subjective modeling of the issues reinforce the course". Hence individuals can end up on inferior paths without knowing it or, even when they do, without finding it worthwhile shifting to one that they agree would be superior for them collectively. The lack of tangible progress in shifting to a path of sustainable development, despite the commitment of many democratically-elected governments to such a shift, is perhaps one of the most worrying instances of this phenomenon.

This sketch of developments in collective-action theory suggests that the collaborative vision for environmental governance is no mere delusion. In particular, it has highlighted the important contribution that communication—the essence of collaboration—between individuals caught in a collective-action dilemma can make to their prospects of agreeing upon a solution and then cooperating with one another in its implementation. However, to what extent does this theoretical framework help to illuminate actual instances of collaborative environmental governance? The historical and geographical context of the case study undertaken to help answer this question—namely, of the central-Murray region's LWMP program—is considered in section three.

3. Case-study setting

3.1 Geography and history

The four Districts for which LWMPs were developed in the central-Murray region largely correspond with four irrigation schemes that were constructed by the NSW Government during the 1930's and 1940's. The Irrigation Districts of Berriquin, Deniboota and Denimein constitute three of these schemes. The fourth scheme comprises Wakool Irrigation District and Tullakool Irrigation Area. They are situated within the broad 'riverine' floodplain of the Murray River.

The farm area in the four schemes is 749,202 hectares. Berriquin accounts for 45 per cent of this, followed by Wakool/Tullakool (29 per cent), Deniboota (19 per cent) and Denimein (7 per cent). The number of farm businesses within the schemes has recently been estimated at 1,610, of which 209 operate farms with less than 20 megalitres of water entitlement. After excluding these small businesses, the average business area is 518 hectares and the average water entitlement per business is 1,026 megalitres (Murray Irrigation Ltd (MIL) 1998). The Cadell LWMP District includes the Deniboota scheme as well as an adjoining area to the east (East Cadell) which includes considerable private irrigation development—some private irrigation schemes commenced operation as early at the 1930's. East Cadell includes a farm area of 156,137 hectares.

The major local centre of population is Deniliquin, with a population of about 8,500. It is a drive of about 300 kilometres (three and a half hours) north from Melbourne and 750 kilometres (nine hours) south-west from Sydney. The local region within which the central-Murray region's LWMP Districts are situated has a population of about 25,000 people (MIL 1999). By area, the greatest agricultural land use across the four LWMP Districts is dryland pasture, followed by winter crops, winter irrigated pasture, and rice. The greatest water use occurs with rice. Across the four LWMP Districts, around 46 per cent of the farm area has been developed for irrigation.

In its early stages, the irrigation industry was used explicitly by the NSW Government as a vehicle for meeting social as well as economic objectives. It was normal within publicly-sponsored irrigation schemes for the area of land held, the amount of water that could be used on it, and often the crop or pasture grown, to be determined by the Government (Berriquin Community Working Group 1995). The principles underlying these controls stemmed primarily from the Government's 'closer settlement' policy of the time which aimed within the irrigation schemes to achieve equitable distribution of water among the maximum number of settlers (Irrigation Farm Working Group 1986). The construction of the schemes was justified too by its contribution to regional employment of labour (Haig-Muir 1996).

3.2 Origins of the LWMP program

The majority of the shallow groundwater within the four schemes is saline. Once a saline watertable rises to within a critical depth from the soil surface, which in this region is considered to be two metres, upward movement of salt to the root zone can occur with consequent deleterious effects on agricultural and pastoral production. Watertables within the schemes were at depths of ten to 30 metres when irrigation commenced in 1939 (Marsden-Jacob Associates 1994).

However, 30,900 hectares within the Wakool scheme had watertables less than two metres from the soil surface by 1981 (Wakool Community Working Group 1995). By 1988 the combined shallow-watertable area in the Berriquin and Denimein schemes had reached 58,000 hectares (Marsden-Jacob Associates 1994). By 1990, the shallow watertable area in the Cadell LWMP District had reached 6,000 hectares (Cadell Community Working Group 1995). The aquifers underlying the watertables in this region normally overlap boundaries between farms, and also between farming and non-farming areas. Due to transmissivity of groundwater within an aquifer, a collective-action problem exists since efforts to lower the watertable beneath any parcel of land help also to lower watertables under land owned by others.

Since the schemes were intended originally for low-intensity irrigation, they were constructed without surface drains (Marsden-Jacob Associates 1994). Intensification of irrigation contributed to worsening agricultural losses from waterlogging, especially in the Berriquin District where lack of natural drainage is most marked. Early responses to this problem emphasised technical solutions conceived and implemented centrally by experts. The engineering-works mindset behind the construction of the schemes was extended to developing solutions to the problems they created. Thus the first stage of a surface-drainage scheme, government-financed and constructed, in the Berriquin District commenced in 1979.

By the end of the 1980's, NSW Government policy for funding further drainage works changed to accommodate the *Natural Resources Management Strategy* (NRMS) developed by the Murray-Darling Basin Ministerial Council. This Strategy "identifie[d] the need for communities and Government to co-operate and coordinate their efforts" (Murray-Darling Basin Ministerial Council 1989 p. iii). Government funding of drainage schemes would thenceforth be provided only if a beneficiary community demonstrated commitment to making complementary changes in its own behaviour.

This policy shift coincided with growing local concerns that rising watertables would threaten the region's agricultural viability by exacerbating the existing waterlogging problems as well as by causing soil salinisation. The Berriquin farming community responded to these concerns by organising a public meeting in August 1991 to instigate development of the Berriquin LWMP. This would constitute a strategy for applying the philosophy of ICM (organised in NSW under the banner of 'Total Catchment Management') at the sub-catchment scale. Over 250 farmers and community representatives attended the meeting and voted to support the proposal. A Community Working Group (CWG) was elected at the meeting to oversee the development of the plan. Representatives from local government and relevant government agencies were subsequently invited to become members of the CWG (Stewart 1992).

3.3 The plan-development phase

By June 1992, CWGs had formed to develop draft LWMPs in all four Districts. The conditions under which the CWGs could gain financial and logistical support from the NSW Government for plan development and implementation were outlined in the *Guidelines for*

Land and Water Management Plans prepared by the Murray and Murrumbidgee Catchment Management Committees (established under the TCM program) in consultation with the NSW Government.

In late 1991, the Department of Water Resources (DWR, the 'lead' government agency in respect of the LWMP program) appointed an independent consultant as the Project Coordinator for the Berriquin LWMP program. Soon after, this role was extended to the processes commenced in the other three Districts. Each CWG met at least monthly until the draft plans were submitted to the NSW Government towards the end of 1995.

After the large public meetings held initially in each District to gain community support for the LWMP processes and select the CWGs, they each instigated strategies of 'grassroots' community participation. Part of these strategies involved the Project Coordinator and CWG members making themselves available to discuss the progress of the LWMP with non-farmer stakeholder groups (e.g., local business associations). The other part of the strategies involved consulting farmers in rounds of locality meetings held in places familiar to them like wool sheds, paddocks, community halls, clubs, and public hotels.

In general, four or five rounds of these locality-based farmer meetings were held during plan development. In Berriquin, the initial round comprised 23 locality meetings, followed by 17 for the other four rounds. The typical attendance at each of these rounds was around 300, or about 40 per cent of Berriquin farm businesses. A final round of four larger locality meetings was held in March 1994 at which the LWMP proposals, their costs and cost-sharing arrangements were discussed.

Negotiations with the NSW Government over cost-sharing arrangements occurred during September 1995. The Berriquin LWMP finally emerging from this process was formally endorsed at a community meeting held a month later and attended by over 300 farmers (Berriquin Community Working Group 1995). Similar community-consultation processes were followed, and levels of community approval obtained, in the other three Districts.

The NSW Government agreed to contribute $116 million over the first 15 years of implementing the four LWMPs, subject to the Commonwealth Government meeting half this cost and the community delivering annually on its agreed contributions. Farmers agreed to contribute $382 million over 30 years. Most of this contribution would be 'in kind', in the form of costs incurred by farmers in adopting the on-farm measures included in the LWMPs. A diversity of in-kind measures of this type appeared in the four plans. Examples are establishment of perennial pastures, upgrading farmers' existing groundwater pumps, and installation of drainage reuse systems. In addition, farmers were levied between $0.50 to $3.15 per megalitre of their irrigation entitlements, depending on the District, to help fund communal LWMP works and measures. Local governments in the region agreed to contribute a further $2 million toward implementing the plans (Marsden 1996).

3.4 Implementing the LWMPs

Deliberations over how authority and responsibility for implementing the LWMPs were to be structured involved a lengthy and intense debate within each local community, as well as between the communities and the NSW Government. Nevertheless, the privatisation of the four irrigation schemes in March 1995 as part of a wider process of water-policy reform was to have a major influence on the outcomes of these deliberations. The four irrigation schemes were privatised in March 1995. With privatisation, the schemes became the property of Murray Irrigation Limited (MIL). The community of irrigators eventually agreed with the

NSW Government's proposal that MIL become the 'implementation entity' for the plans as they apply to its defined area of operation.

MIL is the largest privately-owned irrigation supply and drainage company in Australia, with a bulk entitlement of 1.445 million megalitres—equal to 67 per cent of NSW's allocation from Murray River irrigation entitlements (MIL 1999). It was established in accordance with a cooperative model, with its Articles of Association apportioning the shares in the company among irrigators in proportion to their volumetric delivery entitlements. Eight of the ten elected company director positions are reserved for irrigators, with two reserved for persons with skills in engineering and finance. One vote is allowed for each landholding owned within the company's area of operation (MIL 1997).

Details of how devolution of LWMP implementation authority to MIL was to occur were specified in a Heads of Agreement signed in April 1996 by community leaders and relevant NSW Government Ministers. Such a document signifies agreement in principle, and political convention dictates that it will be honoured by successive NSW Governments. The eventual intention is for the agreement to be formalised legally by way of a funding deed. The Heads of Agreement makes MIL autonomous within the constraints set by Government-imposed conditions attached to the three licenses it needs to operate under the Irrigation Corporations Act, 1994. The three licenses work together to require *inter alia* that MIL ensures implementation of the four LWMPs within its defined area of operation. The legal powers provided to MIL were considered sufficient for it to ensure that farmers within its area of operation would comply with the LWMPs. It was anticipated that the company would enforce this compliance by attaching conditions to water-supply agreements with its customers (Schroo 1998).

These institutional arrangements for implementing the central-Murray region's LWMPs appear to represent the first instance of the ongoing obligations of community and governmental partners in respect of implementing solutions to Australian agri-environmental problems being 'contractualised'. They are notable too in so far as the contracting party for the community, namely MIL, effectively constitutes a common-property regime since it has been granted property rights to assets with characteristics of common-pool resources. These include the bulk water entitlement of the region's irrigators, the irrigation works (channels, weirs, drains, etc.) and also (implicitly) the sub-surface drainage capacity afforded by the 'watertable freeboard' within its area of operation. Moreover, for most of the on-farm measures included in the LWMPs, the implementation targets are specified for farm businesses collectively (e.g., number of on-farm drainage reuse systems installed per LWMP District) rather than for each farm business. Hence a collective-action dilemma persists in so far as each business's contribution towards satisfying these targets is potentially subject to free riding by other businesses.

The four CWGs (renamed Community Implementation Groups, CIGs) now provide feedback and advice to the Board regarding LWMP implementation in their respective Districts (MIL 1998). They have continued to keep their communities involved in implementation decisions through locality meetings, newsletters and the like. The CIGs have an important role in suggesting, on the basis of consultation with their constituents, how their LWMPs can be improved as better knowledge becomes available. The Heads of Agreement anticipated this need by allowing for a process whereby 'substitutions' can be made: namely, agreed variations to LWMPs without changing the total Government and total community contributions.

Minor substitutions can be adjudicated by the Deniliquin-based Murray LWMP Management Committee comprising representatives of the independent auditor, MIL and the Department of Land and Water Conservation (which took over the responsibilities of the DWR). More substantial substitutions must be referred to the higher-level LWMP Assessment Team (LWMPAT). This Sydney-based interdepartmental committee is chaired by a representative of the Premier's Department. In turn, the LWMPAT's recommendation in these cases is referred to the higher-level Irrigation Reform Steering Committee for a final decision. However, ultimately a substitution must be ratified by both the community and the NSW Government for it to proceed (Diacono *et al.* 1998).

4. Case-study method

The approach used to explore the applicability of the theoretical framework sketched in section three to the experience of collaborative environmental governance in the central-Murray region's LWMP program was the case-study method. Eisenhardt (1989 p. 534) described this approach as involving "a research study which focuses on understanding the dynamics within a single setting". Cases are treated as experiments from which insights can be generalised to theory (Yin 1984). Accordingly, use of the case-study method in the present research was consistent with the proposal from Mobbs *et al.* (1999 p. 131) that social-scientific research concerned with environmental governance should focus on "isolat[ing] elements, strategies or mechanisms within particular experiences with potential for more generic application". Dovers (1999 p. 101) argued likewise that:

> Most cases [of environmental governance] can yield useable lessons both positive and negative, and the challenge is to build up a stock of these from across our collective experience, and apply these in various combinations to answer our future needs.

Both qualitative and quantitative research methods can be used in undertaking a case-study. Although both in fact were used in the present case study, the discussion here is limited to the qualitative research[2]. Compared with quantitative methods, qualitative methods are more subjective, seeking to gather data that "captures the richness of detail and nuance of the phenomena being studied" (Hussey *et al.* 1997 p. 56). Hence qualitative methods tend to use data obtained in a less structured fashion than is the case with quantitative methods.

The present qualitative research consisted of analysing in-depth interviews of people regarded as 'key informants' in respect of the LWMP program. The in-depth interview is a conversation with a purpose between the informant and the researcher (Valentine 1997). The questions asked of informants varied according to their interests, experiences and views in respect of the LWMP program. Nevertheless, each interview was 'semi-structured' as a result of starting with a basic set of questions relating to the theme of interest: namely, how collaboration in the program has affected the preparedness of the various parties to cooperate voluntarily in implementing the LWMPs.

Following the advice of Dunn (2000), key informants were chosen to provide an illustrative rather than representative sample. The 30 key informants that were interviewed, and their affiliations at the time, are detailed in table 1. All interviews occurred during 1999. They were tape-recorded in most cases, and later transcribed. Transcripts were returned to informants to validate their accuracy. Transcripts that interviewees agreed could be published are reproduced in Appendix A of Marshall (2001). The three farmers interviewed (Berriquin Farmers 1, 2 and 3) requested that their anonymity be preserved.

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[2] A discussion of the quantitative research can be found in Marshall (2001).

Qualitative analysis proceeded according to the following strategy of coding the data (i.e., text) contained in the interview transcripts:

> Codes label and reorganise the data according to topics which open the inquiry and permit the researcher to make sense of the thousands of lines of words. They are retrieval and organising devices that cluster the relevant segment of the data relating to a particular theme or proposition … . They also play an important role in the process of discovering themes or developing propositions (Minichiello *et al.* 1990 p. 294).

The process of developing a coding system in the present research began with the theoretical themes explored in section two, elaborated according to the case-study context described in section three. This prototypical system was refined as the interviewing process proceeded, as later the taped interviews were transcribed, and later again as the transcripts were reread numerous times over ensuing weeks. This system allowed the text of the various interviews to be organised into units sufficiently small and interlinked to make manageable the task of searching for patterns in the data, drawing propositions from these patterns, and then attempting to corroborate these propositions.

5. Case-study findings

5.1 An uncooperative history

Prior to the commencement of the LWMP program, the relationship between the irrigator community and the NSW Government in respect of how the irrigation schemes were run had been soured by antagonism and mistrust. The irrigators resented the Government operating the schemes paternalistically. Daniel Liphuyzen, who is the current chairperson of the Denimein CIG and was a member of the CWG, referred to "the entrenched bureaucratic attitude of reluctance to change" and characterised the typical response of water bailiffs (i.e., responsible for the day-to-day operation of the schemes) to irrigator-suggested improvements in the running of the schemes as "I hope this doesn't mean more work for us. How are we supposed to do it? It's just not on". Kelvin Baxter—who is an irrigator, a Director of MIL and was the first Chairperson of this company—discussed how:

> New technology just hadn't been taken up at all. The Government was still running the scheme as in 1938 when it was first built. … It was a shocking example of a government trading enterprise really. … I mean it was very much an employment agency.

Consistent with these views from irrigators, Warren Martin, who was Deputy Director of the DWR during the time that the LWMPs were developed, observed that:

> I think that the irrigation areas and districts were seen a bit within the Department as being Government-owned operations. There was a bit of an attitude that we know best. That was there, there's no question about that.

Similarly, Peter Stewart, who was Project Co-ordinator for the plan-development phase of the LWMP program, commented on how:

> … the old Department of Water Resources people used to rule with an iron fist. They had been like that for many years. There was a culture of "them and us". "Them" was the Government

Table 1: Key informants interviewed

Key informant	Affiliation when interviewed	Other information
Berriquin Farmer 1	Located in Berriquin LWMP District.	
Berriquin Farmer 2	As above.	
Berriquin Farmer 3	As above.	
Mr. Bill Anderson	Vice-Chairperson, Cadell CIG.	Farmer, East Cadell portion of Cadell LWMP District.
Mr. Gordon Ball	Director, MIL.	Previously Chairperson, Berriquin CWG.
Mr. Kelvin Baxter	Director, MIL.	First Chairperson, MIL. Farmer, Berriquin LWMP District.
Ms. Ros Chivers	DLWC, Sydney.	Involved in LWMP implementation issues, especially funding.
Mr. Ron Cullen	Director, Integrated Catchment Planning, DLWC, Sydney.	Involved in LWMP implementation issues, especially funding.
Mr. Bill Currans	Executive Officer, Murray Catchment Management Committee.	Previously involved in the LWMP program while employed with NSW Agriculture.
Dr. Mike Curll	Gen. Manager—Strategic Review, NSW Agriculture, Orange.	Previously provided NSW Agriculture's head-office management of the LWMP program. Represented NSW Agriculture in negotiations leading to the Heads of Agreement. Has served as a member of the LWMPAT and the Irrigation Reform Steering Committee.
Ms. Kaye Dalton	DLWC, Deniliquin.	Previously Co-ordinator of the Murray CMC. Co-author of *Guidelines for LWMPs.*
Mr. Noel Graham	Chairperson, Cadell CIG.	Farmer in West Cadell portion of Cadell LWMP District.
Mr. David Harriss	Regional Director, Murray Region, DLWC, Albury.	Responsible for regional DLWC involvement in LWMP implementation issues.
Mr. Jamie Hearn	Cadell LWMP Implementation Officer, MIL.	Farmer in West Cadell portion of Cadell LWMP District. Previously Chairperson, Cadell CWG.
Mr. Peter Jacob	Consultant, Marsden-Jacob Associates, Melbourne.	Analysis of Berriquin LWMP economics and of institutional arrangements for LWMP implementation.
Mr. Scott Keyworth	Director, Natural Resources Projects, MDBC, Canberra.	
Mr. John Lacy	District Agronomist, NSW Agriculture, Finley.	Previously a member of the Berriquin CWG.
Mr. Gerard Lahy	Chairperson, Wakool CIG.	Farmer in Wakool LWMP District. Previously Chairperson, Wakool CWG.
Mr. Daniel Liphuyzen	Chairperson, Denimein CIG.	Farmer, Denimein LWMP District.
Mr. Warren Martin	Consultant, Sydney.	Instrumental in establishing the LWMP program while Deputy Director of the DWR. Involved in privatisation of the central-Murray region's irrigation schemes and negotiation of the Heads of Agreement while Director of Regions in the DLWC and a member of the Irrigation Reform Steering Committee.
Mr. Tony McGlynn	Director, Special Projects, DLWC, Sydney.	Involved in privatisation of the central-Murray region's irrigation schemes and community-government negotiations over cost-sharing for the LWMPs. Previously a member of LWMPAT.
Mr. Geoff McLeod	Environmental Manager, MIL.	Previously co-ordinated NSW Agriculture's input to the LWMP program.
Prof. Warren Musgrave	Chairperson, LWMPAT.	
Ms. Sandy Robinson	Manager, Irrigation Regions Program, MDBC, Canberra.	Previously involved in LWMP program funding while employed with Commonwealth Department of Primary Industries and Energy.
Mr. Hans Schroo	DLWC, Sydney.	Member of LWMPAT at time of interview. Involved in LWMP implementation issues.
Mr. Andrew Sleigh	Chairperson, Murray CMC.	Farmer, Berriquin LWMP District.
Mr. Adrian Smith	Denimein LWMP Implementation Officer, MIL.	Previously involved in the LWMP program while employed by NSW Agriculture.
Mr. Peter Stewart	Consultant, Molino Stewart Pty Ltd, Sydney.	Previously Project Co-ordinator for the LWMP program.
Ms. Sue Taylor	Mayor, Deniliquin Council.	
Mr. Paul Trevethan	Chairperson, SCMCC.	Previously Chairperson, Murray CMC. Farmer, central-Murray region (outside the LWMP Districts).

> and it laid the law down. And "us" were the people who paid the water bills and did what they were told.

The irrigators in the central-Murray region had responded to this historical paternalism by Government through forming the Southern Riverina Irrigation District Council (SRIDC) to press their concerns in the political domain. Mr. Martin remarked how in the 1980's:

> There was a fair degree of antagonism between the SRIDC and the Water Resources Commission [precursor to the DWR] at that stage. You'd go to meetings and there was shouting across the floor. The Commission and the SRIDC at that stage were at loggerheads to a large degree. … The SRIDC viewed the Commission, and the executive of the Commission at that stage … as a very antagonistic group. The SRIDC played the politics pretty hard.

5.2 Leadership

As noted in section 3.2, the NSW Government's decision to address watertable-related problems in the central-Murray region in collaboration with the regional community primarily resulted from external imposition of the NRMS. Forging such a partnership would obviously be challenging given the historical antagonism between the DWR and the region's irrigators. As Mr. Martin observed:

> [T]he Department [of Water Resources] was not necessarily supportive of full community participation at that time. It wasn't only the irrigators that you had bring around, to get greater community participation. A number of irrigator leaders wanted to participate, but there was still some resistance within the Department. There was still a hands-on tell-them-what-they-should-do mentality to a degree.

It seems from a number of irrigators interviewed that committed leadership by Mr. Martin and some other government officers played a major part in lessening this bureaucratic resistance. This helped irrigator leaders to gain trust that collaborating with Government in addressing the watertable-related problems would be worthwhile. For instance, Gordon Ball—who was Chairperson of the Berriquin CWG and is now a Director of MIL—commented that Mr. Martin's early involvement helped to assure leaders of the Berriquin irrigation community that the collaborative process envisaged for the LWMP program could work. Noel Graham and Gerard Lahy—currently the Chairpersons of the Cadell and Wakool CIGs, respectively—independently remarked likewise upon the crucial importance of Mr. Martin acting as their "champion" within the higher levels of Government[3]. Not only was he approachable, but they had confidence in his "vision" for the partnership and that he would stick by his word once he gave it. Indeed, they were satisfied that Government actions were normally delivered as he said they would.

For his part, Mr. Martin explained that working to make himself known personally to the irrigator communities, or at least to their leaders, and taking an active interest in their ideas and concerns was vital to his efforts to win some degree of trust from them. He observed that gaining trust:

> … takes a long time. You've got to build it up. They've got to be confident that you know what you're talking about to a degree as well. And that you can deliver some things. … Probably the difficulty is knowing the problem is there and getting in early to fix it up. Very often you don't hear about the problems. Again it's getting round and talking to people.

He commented as follows on the benefits of this trust for obtaining feedback from these communities: "[T]hey would tell me things they wouldn't tell other people, because they trusted me to a degree".

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[3] Mr. Graham was previously a member of the Cadell CWG, whereas Mr. Lahy had been Chairperson of the Wakool CWG.

The difficulty of reversing the Government's mistrust of irrigators, which had been associated largely with the antagonistic relationship between the DWR and the SRIDC, was in turn lessened significantly by irrigators choosing people to lead them in the LWMP program (i.e., their representatives on the CWGs) who mostly were not linked with the SRIDC. Mr. Martin described this transition as follows:

> The SRIDC tended to be the older irrigators that had been around agri-politics for a long time. … The younger irrigators in the Berriquin, Wakool, Deniboota and Denimein planning working groups were probably in their early 30's … So they were the sons, a generation down. Which I think was good because they didn't come with the same baggage, if you like, from prior SRIDC debates. They hadn't been involved and came with a fairly open mind about the Department and how it could do things.

The challenge facing this new generation of community leaders he described as follows:

> All the irrigators weren't, in my view, convinced that the community could actually do it. Some of them were saying to us at that stage "You go away and do it and tell us what we've got to do". But a number of irrigators were championing the community involvement. There wasn't a lot of them to start with, but there was a growing groundswell. They had some strength and they had a fairly good argument that turned the views of some of the other irrigators anyway. There wasn't a full agreement, to start with, that they wanted actually to participate. Some of them had to be brought along. Gordon Ball was a very strong advocate. In Wakool and Denimein and Deniboota some of the younger irrigators out there had some trouble convincing the older irrigators that participation was the way to go.

5.3 Pursuing community ownership

It seems that building the trust of the wider community in the authenticity of the Government's offer of a collaborative partnership to address the watertable-related problems followed to a substantial extent from Mr. Martin's active commitment to the concept of "community ownership" that was integral to the philosophy of TCM. Mr. Stewart acknowledged this commitment as follows:

> Government certainly had a concept which they wished to put into place. And that concept was community ownership of the Land and Water Management Plans. It was very clear to me when speaking to people like Warren Martin that certainly there'd be boundaries around what would go into these plans. There'd be Government policies and other constraints, but by and large you had a blank sheet of paper. And local community people—because they had to live in that environment and deal with its problems—were seen as the best people to come up with workable solutions. I think that was a very sound philosophy. And I can say that in all my time there I had no pressure from Government at all about changing tack or adding anything.

From the commitment to community ownership followed the decision by Government to appoint Mr. Stewart as an independent Project Coordinator for the LWMP program. Mr. Martin justified this step as follows:

> I saw it was essential to have someone in the Murray on-site. As discussed previously, antagonism management and trust building were important issues. My view was that we needed an independent person. We didn't want a Departmental person. Peter Stewart, a consultant, was already working inside the organisation on another job. He'd demonstrated an ability to deal with community groups on that other job.

Mr. Stewart took up this position in early 1992. Despite the good intentions on the part of Government, its lack of consultation with the CWGs about the appointment caused them concern that the commitment to community ownership of the process had been short-lived. Geoff McLeod, who was with NSW Agriculture[4] during the plan-development phase of the LWMP program and is now MIL's Environmental Manager, explained that the unilateral appointment made the CWGs wary that "DWR [was] trying to run the show again". Mr. Stewart recalled as follows the consequent mistrust of him at the first CWG meeting he attended (with the Berriquin CWG):

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[4] The NSW Government agency responsible for agriculture.

> You could have cut the atmosphere with a knife. It was palpable. … It was a difficult meeting for me. My view was that either I had something to offer or I didn't, and that they'd come to their own opinions about that. And if they didn't like what I had to offer then, well, that's the way life goes sometimes and I'll walk away. If they thought I had something to offer then that would dawn upon them and the relationship would start to develop.

Faced with this mistrust, he decided not to force himself onto the CWGs:

> I never pushed myself on to any of the Working Groups, ever. I deliberately waited to be invited. And I didn't get initial invitations, by the way. It wasn't a case of me just saying "I'm the Planning Coordinator now for all you guys, and I expect to come to all your meetings". They discussed it among themselves and I was invited initially to a meeting. And then it didn't take very long for them to say I should come to all their meetings.

A further strategy, instigated by Mr. Martin, for establishing the independence of Mr. Stewart from the Government was to accommodate him and his small team of staff away from the Government offices.

Aside from protecting his independence from the Government, Mr. Stewart was careful to ensure that he protected it too from the various other interests involved in the program. He explained:

> That way I believed I could make sure that all stakeholder interests could be accommodated without me being seen as siding with any of them. I didn't side with any of them either. I never had one vote at any of the meetings, ever.

He saw that this required him to:

> … drive the process. And, if you do that in a fair kind of way without trying to impose your own views—what you're not looking for is content that *you* believe in; what you're trying to do is have a process that gets content that *they* believe in—then I think you've done your job pretty well.

This role of driving the process was typically pursued through running 'workshop sessions' during CWG meetings—although always in deference to the CWG chairperson. Mr. Stewart elaborated as follows on how he did this while maintaining his independence and achieving CWG ownership of the ideas arising from these sessions:

> Just because of my exposure to a greater range of things, I was in a position to answer questions or give opinions. But I never used to operate in that way. I would always try to seek the opinions and views of the other people there. And nine times out of ten what you were thinking would come from someone else in any event. But then they had ownership of it. That's one reason why we used the whiteboard a lot too. Because ideas that people have, you give them a certain legitimacy by putting them up on the whiteboard. They get excited to see their own idea up on the board. It's true. It works.

In this way, the CWGs incrementally gained assurance that the Government was truly respecting them as collaborators within the LWMP program. Nevertheless, their capacity to fulfil this role effectively depended importantly on their own internal cohesion. Asked whether there was mistrust initially within the CWGs, Mr. Stewart responded "Yes, of course. Some people didn't know each other to begin with. Some people came in there with a bit of baggage, with a reputation for being this, that or the other thing".

The challenge of establishing emotional rapport and trust within the CWGs was probably greatest in the case of the Cadell LWMP District, which encompassed Deniboota Irrigation District as well as East Cadell which contained private irrigation schemes as well as extensive dryland areas. Bill Anderson, who represented East Cadell on the Cadell CWG and currently represents it on the CIG, explained how "there has been a fair amount of feeling between the two areas", particularly because private irrigators in East Cadell believed that over the years Deniboota irrigators had won various concessions from Government at their expense. Nevertheless, it was important for a single CWG to be responsible for the whole of the Cadell since it formed a natural groundwater catchment. Hence Deniboota irrigators would be

unable to address their watertable-related problems effectively without cooperation from East Cadell landholders.

Mr. Graham, who is from Deniboota, suggested that success in encouraging East Cadell farmers to join the CWG was attributable to the Deniboota members of the CWG being a generation younger than the older Deniboota farmers that East Cadell farmers would associate more directly with their "feeling" in respect of Deniboota irrigators. He characterised the Deniboota members accordingly as "sons of current property owners, idealistic, who presented no challenge to anyone. Nevertheless, we were old enough to represent the future and have our ideas respected". Mr. Anderson agreed with Mr. Graham's interpretation of events and went on to observe that Jamie Hearn, who had been Chairperson of the Cadell CWG:

> … was one of the greatest things in building bridges between East and West Cadell. Because he came from West Cadell, from Deniboota, but he showed an equal concern for those who lived in East Cadell.

Even so, it seems it took genuine leadership for Mr. Anderson and other East Cadell farmers to agree to join the CWG. Mr. Anderson recollected that "[I]t was hard at the start. I think a lot of people at the outset felt betrayed that we got involved".

Within the CWGs it was understood that decisions would not be owned by all members unless an atmosphere of trust and respect among members existed that encouraged everyone to frankly air their ideas and views. Mr. Stewart recalled:

> Someone said to me they'd remembered as important me saying "There's no wrongs and rights, just differing opinions". It was just something off the top of my head at the time. But it kind of settles people down and it generates the right atmosphere for people to put forward their points of view. The Working Group in Cadell was just terrific. They were outstanding. They had the capacity to debate issues with a whole range of views in the room, but without acrimony. And there was a lot of humour.

Mr. Liphuyzen observed similarly that:

> People have different opinions and you've got to let everyone express their opinions. … You can get too much group-think. You've got to let everyone express their opinions so that you get that other view. Otherwise you'll be too blinkered in your approach.

Nevertheless, it was clear that ownership of the LWMPs by the CWGs would not in itself guarantee ownership by their respective communities. Consequently, each of the CWGs devised a strategy for engaging the participation of their respective communities in the LWMP program. John Lacy, who is an agricultural extension officer with NSW Agriculture and was a member of the Berriquin CWG, recalled that the CWG originally considered holding occasional large public meetings for the purpose of obtaining wider community participation. However, his experience had taught him the advantages of small discussion groups for achieving beneficial changes in farmer behaviour. He observed that:

> The big benefit of discussion groups is that it allows farmers to learn off each other and it allows farmers to give feedback. Farmers are looked on as being equals to the facilitator. It's just a great learning process.

Mr. Lacy and others argued successfully that this approach to involving farmers should be adopted by the Berriquin CWG. The Berriquin District was accordingly divided up by the CWG into the localities within which discussion-group style meetings would be convened. The other CWGs saw merit in this strategy and chose independently to follow a similar strategy. Mr. Liphuyzen commented on the effectiveness of this strategy in the Denimein District as follows:

> Smaller groups offer people much more of a hands-on involvement. They are much more at ease to comment on what they think of something. If you just had one regional meeting, you'd get people who always want to hear their own voice and also a lot of people that just sit and say nothing and have no input. So the smaller meetings were a good part of the process. If we came up with something that wasn't acceptable, I think we would have been told straight away.

Each of the three Berriquin farmers interviewed made similar comments. For instance, Berriquin Farmer One said:

> There's only the odd one that gets up at a big public meeting. I think people feel far more comfortable speaking with their neighbours just in the local area than they do standing up at the town hall.

Even so, as Mr. Lahy recalled, some farmers would have kept quiet at the smaller meetings too if they hadn't been personally encouraged to speak up. He explained that this reticence was typically overcome in the small-group format by the chairperson "eyeballing" everyone present and asking them in turn "Well, what do *you* think?".

A further feature of the locality meetings that a number of those interviewed indicated was vital for their effectiveness in gaining ownership of the meeting outcomes by the participants was that the responsibility for chairing the meetings, presenting technical information and leading discussions was largely taken on by CWG members living in, or at least known, in those localities. Mr. Lahy claimed that this strategy was instrumental in gaining trust from the wider farming community that the consultation process was genuine and that the information provided to them was correct. Mr. Graham commented that this strategy had the advantage also of allowing a CWG to use its knowledge of local culture in order to frame and present information and options in order to "move" its community to best effect.

5.4 Community-Government collaboration in LWMP development

Ownership by the Government of the LWMP program and the resulting plans was clearly critical also, especially given that it was providing resources to support plan development and looking to contribute considerable funds toward the implementation of the plans. Consequently, it had a legitimate interest in ensuring that plan development was technically sound. This was acknowledged in Mr. Stewart's comment that:

> … I saw there'd need to be a process which engaged the community but also had strong technical support to it as well. And the two were interactive all the way through. … So there was a sort of marriage of farming common-sense and aspirations with the technical side of things.

Nevertheless, the marriage was not always an easy one. For instance, some of the CWGs believed strongly that the Government's commitment to community ownership of the process meant that they should have a real say in how the funds provided by the Murray-Darling Basin Commission for plan-development-related technical studies were used. They were wary that the DWR would dominate these kinds of decisions by virtue of being the direct recipient of the Commission's funds, and as a result retain "in-house" more of the technical program than justified by its capacity to deliver what was required on schedule.

Thus Mr. Stewart claimed that "at the start the Department said 'Yeah, it's all contestable. It is alright if you go out into the marketplace'. But that only lasted until the crunch time came". He observed that it was a case of:

> The Golden Rule applies: He who has the gold makes the rules. … And they doled it out as they saw appropriate. … When an external source of funds comes up, such as LWMP money, the temptation is to not use it entirely on the purpose for which it was given. Thus sometimes tenuous connections were made between the LWMPs and what people were doing in the Department, in order to justify paying Departmental staff salaries from that bucket of money … and that did happen to some extent. Not a lot, but it did happen.

In a similar vein, Peter Jacob, who undertook various consultancies commissioned as part of the plan-development process, concluded that:

> I think that you need to set up processes to avoid governments then capturing a lot of that funding for themselves. If that happens then you can really mess up the strategic direction of the plan-development process. It becomes looking for research just for the sake of research. There's a number of examples I could identify.

Mr. Stewart attributed this problem of CWG dissatisfaction with collaboration by Government regarding the use of program resources to a lack of appropriate experience and skills on the part of some key Government staff in the region. He commented as follows that it was less a problem of Government lacking in-principle commitment to collaborating with the community through the CWGs:

> There was a commitment, that's one thing. You may have a commitment to marry, but you may still end up divorced. No, they didn't have the skills. … [S]aying it will work isn't enough to make it work. The people who are involved have to make it work.

However, Mr. Martin indicated as follows that the problem may also have been partly due to paternalistic attitudes lingering at the regional level in DWR:

> When the LWMPs started, the region still at that stage regarded the irrigation areas and districts as their responsibility to a degree because the privatisation hadn't occurred. … Some of the management people in the region didn't like it at all, having the irrigators telling them what to do.

It seems that another reason for the problem sometimes was lack of appreciation by CWG members of the complexity of the technical issues. As Mr. Martin observed: "The community will always think that you can do modeling in about a tenth of the time that you can actually do it in, to get the proper answer out of the thing". He went on to comment that this misunderstanding lessened as the CWGs became more aware of the complexities involved: "I think there is now a better understanding of how difficult it is in a lot of these exercises to actually undertake technical studies, and get answers, and actually have to make decisions".

5.5 Community-Government negotiations over implementation arrangements

Nevertheless, LWMPs were ultimately developed which, after a process of negotiation, were agreed to by the communities of the four LWMP Districts, as well as by the NSW Government. Ownership of the plans by the various District communities was demonstrated, in the words of Mr. Stewart, by:

> … the overwhelming support the plans got at the final stage. Every plan had a large community meeting at the end to see if the plan was supported or not. And they turned up in their droves. They gave a tick to what their Working Group had done.

What had been agreed between the District communities and the Government was formalised in a Heads of Agreement, as discussed in section 3.4. Mr. Ball remarked that this document is valued by the communities, as well as by MIL as the designated implementation authority for the LWMPs, as providing them with greater trust that Government will deliver on its side of the LWMP implementation program than they would have taken away from promises backed only by handshakes. Mr. Stewart observed likewise that "I think that one of the real strengths of the LWMPs is the extent to which obligations were stitched up in a 'contractual' sense. And those obligations are in place irrespective of the personnel who were there at the time in the agencies".

By the same token, signing the Heads of Agreement represented a significant concession from the communities of the LWMP Districts. When asked about the strengths of the LWMP program, Ros Chivers, an officer in the head office of the DLWC, replied as follows:

> I think the fact that there are, for want of a better word, contractual arrangements in place that require that landholders and Murray Irrigation actually do what they agreed they would do, so that we do get on-ground change. Without those sorts of contractual arrangements, we are finding that there is very little sustained on-ground change in other areas of the State. In other areas maybe $100,000 is handed out for certain work to be done, but it's not necessarily the case that the work is carried out or maintained. Because there is no monitoring and evaluation, nor any contractual arrangement to say "If you don't do it, then we will penalise you".

Warren Musgrave, who was Chairperson of the LWMPAT at the time of interview, remarked similarly that community-government collaboration process followed in the LWMP program had been successful:

> … in the sense that you have a contractually-based partnership arrangement between government and a community group for a plan where the costs are shared between the two partners … This to my mind is a significant breakthrough in resource management in Australia, to give that degree of discipline and formality of agreement between the parties. And to get to the point of actually having done it is a fantastic achievement. … Now I don't think that a top-down approach would get you that far. Except perhaps with significantly greater incentives.

The last sentence indicates that the greater trust in the plans and Government that the communities gained as a result of being engaged in the program had a tangible economic impact in so far as it made them more amenable to cooperating spontaneously with Government—thereby reducing the transaction costs of inducing them to do so. The following observation from Mr. Martin demonstrates the vital contribution that the leadership of the District communities, namely the CWGs, and the trust that was engendered in them through the community-participation process, made to realising this outcome:

> You've got to give the credit for the success probably to the Working Groups and the Chairs who ran them. … It wasn't all pats on the back from the community people for the LWMPs. Gerard Lahy often told me "I don't know why I'm doing this. I'm getting more abuse out of this than doing other things. I could be away just managing my farm". … He actually drove the community through some of the changes. When he took back to his community the funding negotiation outcomes, he had some trouble getting their agreement to them. … [He] had to battle to get endorsement because some of the community were saying "No, Government should be paying more". He actually won their hearts and minds over.

In fact, this ownership by the CWGs of the plans they had developed led to considerable tension when it became apparent to them that it was the Government's intention that MIL, once the privatisation had proceeded, would become responsible for implementing the four LWMPs rather than themselves. As Mr. Baxter, who was to become the first Chairperson of the Board of MIL, recollected:

> There was no doubt that the four individual CWGs developed a fair bit of ownership of what they were doing and desired to be themselves responsible for implementing the LWMPs. … But they would never have been incorporated bodies, and that would have presented problems with managing the Government funds and so forth. And Murray Irrigation was going to be the entity that held the Supply License, the Operating License and the Pollution Control License. And a condition of those licenses was successful implementation of the LWMPs. It's not that we didn't trust those blokes, but we reckoned we'd need to have our foot on it. So a reasonably tense situation developed …

Mr. Martin elaborated upon this account as follows:

> [I]n the end Kelvin Baxter became a very strong advocate and had to go and sell the new company as the implementer. And he managed to sell it. But the Board[5] itself wasn't necessarily fully trusted. People downstream in Deniboota and Wakool saw the Board as looking after Berriquin and not looking after them. There was this geographical attitude and the Board wasn't held up by all irrigators as a panacea.

Eventually a mutually-acceptable compromise was reached. According to Mr. Baxter:

> [It] was resolved in a common-sense way. … [W]e ended up with the LWMPs all under the control of Murray Irrigation. And I say that only in an institutional sort of way. The framework still gave the CIGs plenty of room for local autonomy regarding local decisions about what was best for their area and their plans. Under the framework, Murray Irrigation were responsible for the CIGs' actions. We had to ensure that what they did in their plan areas was in the best interests of us complying with our licenses.

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[5] This refers to the Irrigation Management Board (IMB) for the central-Murray region which the Government established under section 17 of the Water Resources Act. Mr. Martin commented that "The Department [of Water Resources] was directed [by Minister Causley] to give the Board a major say in the running of the irrigation districts, because the Government wanted to move toward privatisation". Mr. Baxter was Chairperson of the IMB by the time that deliberations over local implementation of the LWMPs had begun.

> Provided our aims were being satisfied there, they were, and still are, given a lot of latitude in how they implement the broad objectives of the LWMPs.

This arrangement seems to have worked out reasonably well. For instance, Mr. Liphuyzen remarked that a number of issues had led the Denimein CIG to:

> … sort of come to loggerheads with Murray Irrigation. But I suppose Geoff McLeod, Murray Irrigation's Environmental Manager, also has got to answer to the CIGs for the other LWMPs. He's also got to answer back to Murray Irrigation. So when we try to push something through, we've got to have something that is workable and that we can all live with. So there has been a bit of compromise there. And Geoff's also got to ensure that the LWMPs are acceptable to LWMPAT as well. Whoever we had as the implementing body would have had the same onus on them. We've been happy enough with Murray Irrigation.

This account meshes well with Mr. McLeod's description of MIL's experience with the arrangement:

> From time to time, there has been inconsistency between the [MIL] Board's desires and the desires of the CIGs. But I think that, in almost all cases, the differences have all been adequately resolved, albeit with a bit of pain. With some issues, I guess, the groups have wanted to take a more "softly, softly" approach to change. Individuals on the groups of course are going to be directly affected by some of that change. Obviously, they can influence the decisions that are made in their groups. Whereas the Board has a broader responsibility.

5.6 Common-property governance of community compliance with the LWMPs

The Heads of Agreement had the effect *inter alia* of devolving to MIL the responsibility for ensuring that individual farmers within each of the four Districts satisfy collectively the on-farm requirements of the LWMPs. It left the company discretion as to how this might be achieved. Mr. McLeod characterised the strategy MIL has applied in ensuring on-farm compliance as follows:

> Our approach has been, first, education, second, encourage by incentives, third, make them aware that there are sticks in the cupboard and, fourth, you pull the stick out and use it. We hope that we don't have to get to the last stage. As a generalisation, we often see that people only do the wrong thing because they don't understand the impacts of what they are doing. We focus first on increasing landholders' awareness of the impact of their actions, or how they might change their actions to benefit others as well as themselves. Murray Irrigation has got the ultimate stick of being able to turn someone's water off. We seek to use that as sparingly as possible. … But there are individuals who will always try and get around us. And anyone who does, by stealing water for example, is hit pretty hard. Their wheels are locked, and their irrigation allocations are debited. For farmers who grow rice on unsuitable soils, there are water penalties applied to them. For farmers who transgress our Total Farm Water Balance Policy, their following year's allocation is reduced.

The hope was that co-ownership by irrigators of the organisation responsible for intervening to ensure LWMP implementation, together with the dependence of this common-property regime and themselves on successful implementation, would make them more prepared to cooperate with interventions than if it were the Government, which historically they had mistrusted, that was intervening. Indeed, this hope appears from the comments of key informants to have materialised in significant degree. For instance, Tony McGlynn, who is an officer in head office of the DLWC, judged that locating responsibility for implementing the LWMPs with MIL has been "very important in getting real change on farms. You wouldn't be able to get it out of Government. It would be a 'dig in' situation". Consistent with this view, Berriquin Farmer One said that "I think now, as Murray Irrigation's shareholders, we can see that it has to take more responsibility for environmental management and that they've got to do something".

It seems also that irrigators are becoming aware that MIL's responsibility for policing implementation has put the region's irrigation community in the position of being able to

establish a positive environmental reputation for itself rather than merely attempt to avoid a bad reputation. Berriquin Farmer Two remarked accordingly that:

> I personally feel it's better with Murray Irrigation doing it [making and policing the rules]. And it demonstrates to the Government that we are serious and that we are trying. It's no longer the Government chasing us around and saying "You're not doing the right thing". … If we can collectively show through Murray Irrigation that we are trying, and that we're not going to tolerate people that do the wrong things, it must help us collectively. It's important that we look like we're trying to proceed down the right path, because there's a lot of negative feeling about irrigators.

In a similar vein, Mr. Baxter stated that:

> I believe, and I say this to irrigators, "We should respect the responsibility we have been given as an organisation. Do we really want the Environment Protection Authority going up all the back lanes looking for problems? Or do we want to be responsible for finding out ourselves what's going on up those back lanes ourselves and nipping those in the bud? … If we don't take our responsibilities seriously, we may well lose them. Then all the irrigators would be worse off".

Moreover, the comments received indicate considerable confidence that MIL is more committed and successful in its attempts to expedite LWMP implementation by farmers than would be the case if Government were the responsible entity. For example, Mr. Jacob commented that:

> [Y]ou now have a very environmentally-responsible irrigation entity … compared with when the irrigation schemes were under government ownership. … We've been surprised by how quickly the private entity in this case has picked up the resource management role.

Sandy Robinson, from the Murray-Darling Basin Commission, observed similarly from her experience with the LWMP program that "It's interesting that once you've got things down to an arrangement, communities tend to be tougher on themselves than they'll let government be with them".

Likewise, Mr. Hearn thought that MIL has achieved far more in implementing the LWMPs than would be the case if the Government were still responsible. The company had introduced some tough policies in support of the LWMPs—including limiting average water application to four megalitres per hectare, and compulsory testing of soil suitability for rice growing—which he believed would have been beyond the political will and capacity of Government to introduce effectively. He claimed that around 15-20 per cent of farmers were upset by these policies. Mr. Lahy made a similar comment, observing that "It was a very difficult policy for Murray Irrigation to sell, and Geoff McLeod has borne much of the brunt of it".

Nevertheless, the company cannot take for granted that the cooperation from most farmers it has enjoyed to date will continue. Ms. Robinson recalled confronting people in MIL with this challenge by asking them "How do you not become 'those bastards in town' as opposed to 'those bastards in Sydney'?" Mr. McLeod acknowledged that maintaining the trust and support of farmers depends on the company continuing to engage them actively in its policy-making deliberations. He claimed accordingly that:

> The company does go out of its way to listen to what people are saying, not only to be seen doing it. When developing major policies we have on each occasion set up consultative committees of local landholders to develop those policies. Our Directors are democratically elected, so I guess that they are very much aware that if they ignore the views of their constituency they may not be on the Board the next time around.

In addition, as observed by Mr. Baxter, the SRIDC since privatisation has actively pursued a new "role of watchdog for the shareholders in respect of how Murray Irrigation operates".

Due to these democratic checks and balances, a considerable degree of flexibility typically has been built into MIL's environmental policies in order to satisfy local norms of fairness.

For instance, Berriquin Farmer Two remarked when discussing the policy limiting average water application:

> I know it's caused a bit of hardship to some of my friends. … [But] no, I don't think they feel that they've been treated unfairly. There are ways around it. If you do your whole-farm plan and start your drainage works, then Murray Irrigation will allow you to use more than four megalitres per hectare. You can then use up to six megalitres. They've restricted people, but they've also allowed people to get around it if they do the right thing.

In addition, Mr. McLeod explained that the company has sometimes used a "good cop, bad cop" strategy to deflect onto the Government any farmer resentment of its policies:

> I guess we have created this fear of the Environment Protection Authority within our farmers' minds. We've stressed that they ultimately can shut us down. They can also take individual action against a grower rather than just Murray Irrigation. So that has helped us in getting them to focus on the issues.

A further interesting issue concerns the extent to which the status of irrigators as co-owners of the governance regime has made them more likely to help it meet its LWMP implementation obligations by applying to one another sanctions of the kind that they use in other contexts to informally encourage adherence to local customs or norms. According to Mr. Baxter this new-found status has indeed made them:

> … more likely to take action against fellow farmers [who abuse their rights to extract water from the irrigation supply channels] than they were before. Previously it was seen as the Government's water, and it was a bit of a sport trying to rip the Government off. But when it's your own system, then they are ripping you off.

However, it seems at this relatively early stage of the LWMP implementation process that any sanctioning by farmers of one another's adoption (or lack thereof) of LWMP measures that does occur is mostly one-to-one through casually-proffered admiration or information. For instance, Berriquin Farmer Two commented that:

> I don't encourage other farmers. But if someone says "You've done that. What do you reckon about that?", then I'm very happy to say "We've done these things and this worked and that hasn't worked". No, we don't go around telling people what they should or shouldn't be doing.

He added:

> I don't think you are looked upon badly [by other farmers] if you don't do the things in the LWMP, because it's understood that it costs a lot of money to do it and so you might not be able to afford to do it. … But if you do a good job on your farm I think people will think "He's done a good job on his farm". So perhaps that is a social kind of encouragement to follow the LWMP on your farm.

Nevertheless, the following anecdote from Mr. Liphuyzen indicates that farmers can be prepared to exert peer pressure on one another in instances where there is an open lack of support for the LWMP program that they feel is unjustified:

> We've had one or two people in the community that weren't overly enthused about the [Denimein] LWMP. … And I've actually seen a classic case of social pressure down at the pub here. One of them started going on about how he didn't like this and he didn't like that. Three other people turned around and pounced on him and made him shut up. He's actually in the process of doing a farm plan now, and moving ahead too.

Mr. Liphuyzen suggested as follows that peer pressure among farmers to adopt LWMP measures would strengthen with their increasing awareness of the costs of not doing so for the environment and the reputation of the region's irrigation industry: "As people become more aware, they will say 'Look at that fella there. He's ripping all his trees out. He shouldn't be doing that'". Berriquin Farmer One suggested another reason why peer pressure among farmers to adopt LWMP measures may strengthen with time: "As more and more farmers take it up, I think greater pressure will be brought to bear on the ones that aren't doing it". This possibility is consistent with Mr. Hearn's comment that:

> The plan is very much alive in people's minds. There is lots of 'looking over the fence' to see what other farmers have done. It's like a 'domino effect'. One farmer's uptake of LWMP practices leads others to follow suit.

To the extent that peer pressure among farmers does strengthen with time, it seems likely that CIG members would find themselves with an important role in mediating this social process. As Mr. Hearn remarked, they naturally are the focus of day-to-day feedback from farmers about the LWMPs, including gossip regarding the activities of particular farmers. In farming communities it is common for individuals to avoid endangering relationships by sanctioning one another directly. This is because each relationship typically constitutes a vital portion of the social capital available to an individual for meeting their needs, such as help with emergencies and companionship. As Mr. Stewart observed, "[I]n the country … if you alienate your neighbour you can't just go a hundred metres and find another one. That's it, you're boxed in".

6. Concluding comments

These case-study findings corroborate the conclusion from 'second-generation' developments in collective-action theory that communication has the potential to enhance individuals' preparedness to cooperate in providing collective goods such as environmental conservation. Hence it appears that the prognosis for bringing the collaborative vision for environmental governance is more optimistic than is suggested by the zero-provision thesis associated with the neoclassical-economic, or 'first-generation', theory of collective action. In particular, the case study offers considerable empirical support for the second-generation theory's proposition that communication can increase the likelihood of individuals behaving cooperatively as a result of increasing their trust that their cooperation would be reciprocated rather than exploited.

Nevertheless, it is clear too from the case study that the contribution of a collaborative process to building cooperation cannot be taken for granted. It is evident that the progress in the central-Murray region's LWMP program towards realising the collaborative vision depended crucially on the details of how the collaborative process was organised and executed. Moreover, it is apparent that much of the practical importance of these details for building trust—including the integrity and inspirational qualities of the governmental and community leaders, and the integrity, knowledge and attitudes of the people responsible for driving collaboration—derives from the positive emotional responses they evoke from participants in the process. Thus failure to account for these responses—and the cultural mores upon which they are based (e.g., mental models and social norms)—would seem to seriously compromise the prospects of bringing the collaborative vision to fruition.

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