

Land Literacy in Australia

—landcare and other new approaches to inquiry and learning for sustainability

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Abstract

Modes of agricultural extension and research in Australia are undergoing rapid change in the face of profound environmental, social and economic challenges and the emerging political momentum of sustainable development. This paper reviews the context in which these changes are occurring and describes several innovative programs, including land literacy, which are expanding the range and nature of stakeholder participation in natural resource management. These initiatives make distinctions between research and extension redundant, and are participatory in nature, generating new roles for professionals in agriculture, with profound institutional implications.

Keywords: participation, sustainability, landcare, land literacy, rural Australia, extension, facilitation, stakeholders

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Introduction

There has been a quiet revolution in land management research and extension in Australia over the last ten years, particularly in the field of land conservation. This paper describes some of the new models of interaction emerging between farmers and the professionals working with them in Australia. It is beyond the scope of this paper to do more than introduce a small selection of many possible initiatives, drawing upon more detailed explorations of these projects and programs from Campbell (1994a), Campbell and Woodhill (in press) and White et al (in press). The theoretical implications of this empirical work are discussed in Campbell (1994b). Suffice to say that field experience endorses the notion that the linear model of technology transfer—based on the assumptions of the theory of diffusion of innovations, in which information is likened to a static commodity produced by research and marketed by extension to progressive farmers, eventually diffusing to the rest—is inadequate for explaining knowledge processes in farming, and even less useful in generating models of research and extension which reflect the transition from the productivist era to the sustainability era in agriculture (Röling 1993, Pretty and Chambers 1993).

Sustainability is a contested, constructed, contextual chameleon of a concept (Campbell 1994b). It frustrates conventional institutional arrangements and ways of thinking about research and extension. Getting serious about sustainability means grappling with large and unfamiliar scales in space and time; technical uncertainties and risk; a multiplicity of stakeholders with diverse values and interests; an intricate interdependency of economic, social and environmental issues; and situations in which decisions are often urgent and stakes high. One has only to attempt to answer some simple questions—sustain what? over what area? for how long? for the benefit of whom? measured by what criteria?—to appreciate that sustainability can never be precisely defined. In fact the very search for a precise definition of sustainability betrays thinking which is out of step with the challenges to human societies which have given rise to this discourse. It is more useful to talk about becoming more sustainable, to debate what constitutes an improvement. Such debates will inevitably take place in particular cultural, economic and technical contexts. Outcomes will therefore be socially constructed, weighing up ecological integrity with social equity and economic efficiency, riven with tension, compromise and non-linear trade-offs. The real challenge is not to define sustainability, but to develop the processes, the forums, the modes of inquiry and learning to better inform and support this debate, a debate which society cannot afford to leave to scientists, economists, lawyers and politicians.

Landcare in Australia embodies many different combinations of participants, structures and processes which have emerged in a great diversity of circumstances. This very diversity underlines that there is no sole answer, no blinding insight or single big idea as to how to approach sustainability. It exemplifies many of the theoretical postulations of the Argentine mathematician Silvio Funtowicz and the British philosopher of science Jerome Ravetz, in their proposition of the need to develop a new ‘post-normal’ science based on extended peer communities and ‘extended facts’ (Funtowicz and Ravetz 1993) if humankind is to adapt to the challenges of the sustainability era.

Environmental, Economic and Social imperatives for farming a tired old continent

Australia is an ancient land and the history of European settlement in Australia is very short. A thumbnail sketch of the history of agricultural impacts on the landscape (described in detail by Neil Barr and John Cary [1992]) reveals a gradual exhaustion of the soils in cropping areas and of perennial pastures in grazing regions up until Federation in 1901, owing to overgrazing, overcropping

and the devastating impact of rabbits. Then the introduction of new wheat varieties, superphosphate and dry fallow heralded new prosperity for wheat farmers, which proved to be short-lived, as bare fallow and cultivation reduced soil organic matter and broke down soil structure. The erosion decades of the 1930s and 1940s spawned the first widespread community concern about land degradation (Bradsen 1988) and the establishment of soil conservation agencies by state governments. Improved pastures and crop varieties, clover ley rotations, soil conservation works, and the apparently successful biological control of rabbits, dramatically reduced erosion. The wool boom of the early 1950s saw a new golden era in which pastoral fortunes were consolidated, and agriculture was the mainstay of the Australian economy.

However over the last forty years more insidious and intractable long term problems have emerged: various combinations of soil erosion, salinity, acidification, soil structure decline, waterlogging and water repellence affect a significant proportion of the land used for agriculture (Beale and Fray 1990); fresh water resources (both groundwater and surface water) are being depleted and degraded; half of the tall and medium forests and about 35 per cent of the woodlands have been cleared or severely modified; there is an alarming and accelerating rate of extinction of native flora and fauna; and finally, many introduced plants and animals have been ecologically disastrous (Australian Bureau of Statistics 1992, Cocks 1992).

Barr and Cary (1992) caution that current prescriptions for more sustainable farming practices may not stand the test of time, that these complex issues will not be solved by simple recipes. They note that each generation has defined its own challenges (survival, development, and now sustainability) according to its cultural norms. Reviewing the ecology of agricultural systems throughout history reveals that the exact nature of farmers' response to their environment depends not so much on the ecological constraints imposed by their environment, as on the society in which they find themselves (Bayliss-Smith 1982). Landscapes and ecosystems are socially constructed. The British settlers tried to impose on the Australian continent the farming systems with which they were familiar—sheep, cattle and annual crops—which had evolved in England, 'that green and pleasant land', blessed with reliable seasons, soft rains and fertile soils forgiving of cultivation and cloven hooves.

The following reflection of an old Australian farmer puts this in perspective:

[If we \[Australians\] had discovered England, do you think we would have shot all the local animals and grazed it with kangaroos?](#)

Rural decline in Australia is severe. The Australian Bureau of Agricultural and Resource Economics (ABARE 1991) estimates that farm business profit on Australia's 77,800 broadacre farms declined by 350 per cent between 1989/90 and 1990/91, to an average loss of \$18,000 per farm. Fisher (1993) forecast an average farm business loss of \$10,500 in 1992/93, worsening again to a loss of \$13,200 for 1993/94. Consecutive years of negative profits make things extremely difficult for people attempting to carry debt. The average broadacre farm in Australia in June 1992 owed more than \$100,000 and paid \$14,000 in interest (ABARE 1992).²

The number of farms continues to decrease and the average age of farmers is in the high fifties and increasing. Lawrence and Williams (1990) note that: about one-third of Australia's country towns are in decline, associated with population movements and government rationalisation; rural poverty is more widespread and is more chronic than urban poverty, and those in poverty in the

² A farm business profit/loss is the net result after costs, depreciation and an allowance for family labour are deducted from farm cash income—the amount remaining being the farmer's margin for new investment or saving for lean times. Broadacre farms include the cereal cropping and other dryland cropping sectors, the sheep for meat and sheep for wool sectors and the beef sector, which together account for more than 70 per cent of the gross value of agricultural production and which occupy the vast majority of the land used for agricultural and pastoral production. More than one-third of broadacre farms have no debt, so the average debt level for those in debt is much higher than \$100 000.

country exhibit greater social and health problems than the poor in cities; the level of domestic violence, consumption of alcohol and tobacco, incidence of hypertension and psychiatric disorders is higher in rural than in urban Australia; and access to education, health and welfare services is much more restricted (Bryant 1992).

Rural decline is not just a social and economic issue, it has profound environmental implications. More sustainable systems of land use and management are unlikely to be developed or implemented by people preoccupied with short-term survival. In short, existing systems of food and fibre production, in Australia at least, are unsustainable. The rural sector is ageing, shrinking, stressed and losing money, depleting natural and human resources.

Variations on the Participatory Theme

Landcare

Australian farmers started to form voluntary groups to cooperatively tackle problems such as salinity, wind erosion and pest animals and plants at a district scale in the early 1980s, notably in Western Australia and Victoria, encouraged by state soil conservation agencies. In 1986 the Victorian government introduced a broader, community based program through which funds could be obtained by voluntary land conservation groups, which it registered under the name 'LandCare'.

In 1988, an historic partnership was forged between the National Farmers Federation (NFF) and the Australian Conservation Foundation (ACF), who jointly proposed a National Land Management program (Farley and Toyne 1989), the key elements of which were increased funding for Landcare groups and property planning. The Australian government acted on this initiative, announcing that the 1990s would be the Decade of Landcare and outlining a US\$250 million ten year program based to a large degree on the NFF-ACF document. Despite tough economic conditions in rural communities, the explosive growth of the Landcare movement has continued, with over 2700 Landcare groups by 1996, involving about one-third of Australian farming families (Alexander 1995).

Landcare is an unstructured movement of voluntary community land conservation groups. Landcare groups operate cooperatively at a local or district level, usually with an initial focus on land degradation problems, evolving to broader considerations of developing more sustainable farming systems. Groups usually involve less than 100 members (often 20-30), covering areas ranging from a few thousand hectares to several million hectares. Common activities of Landcare groups include: field days and farm walks; demonstration projects—usually land degradation rehabilitation works; development of catchment or district plans which set out coordinated approaches towards sustainability; facilitation of the development of individual property plans within the context of the catchment plan—employing consultants, running workshops, coordinating incentives and resources; active involvement in land literacy programs (see below), often in conjunction with schools and government agencies; provision of land conservation equipment for hire to members and other land users; research and development trials with government agencies, universities, agribusinesses, CSIRO; and production of educational pamphlets, videos and manuals.

What's New about Landcare?

Landcare differs from traditional government-directed land conservation activities in several fundamental ways:

- On the whole it is not government-directed. Certainly, funding guidelines established by government influence the direction of Landcare group activity, and government agency staff have a powerful technical and facilitating influence on the effectiveness of Landcare groups. However the vast majority of Landcare groups determine their own priorities, their own boundaries, their own membership, their own ways of doing things, in a great diversity of bio-physical, socio-economic and legislative-administrative environments across the continent.
- Landcare operates at the level of the district/catchment/community, rather than the individual farm, allowing coordination of technical information and practical resources at a more appropriate ecological and social scale. As Landcare groups tend to be neighbourhood groups (involving the majority of people within a defined boundary) rather than commodity production groups (involving cohorts of similar farmers scattered diffusely over larger areas), they have the potential to represent all relevant community interests—although the extent to which this occurs is also influenced by social factors and can be a focus of concern for facilitators.
- Landcare groups tend to broaden their concerns, initially from a sole land degradation issue (say salinity) to a range of degradation issues, then to a more positive focus on developing a more sustainable farming system, which then leads to the integration of social and economic concerns into group activities. The beauty of the Landcare group model is that the linkages and interdependencies between land degradation problems, between conservation and production issues, and finally between environmental problems and social and economic issues, can be exposed in a way which encourages an integrated approach to tackling them. The other side to this coin is the potential for people to be overawed by the scale and complexity of these issues, and to feel powerless to influence the forces shaping their lives. This duality means that the type of facilitation support available to groups, the processes they use to work out where they are going and how, and the institutional context in which they operate, are critical factors influencing long term effectiveness.

Landcare groups can potentially, through cooperative, coordinated approaches, solve problems at a district scale which cannot be tackled effectively at the individual property level—especially water-related issues such as salinity, erosion, waterlogging, water quality decline and irrigation management; nature conservation, in particular preservation of biodiversity; and management of vertebrate pests and weeds. Landcare groups create a collective social pressure in favour of developing more sustainable farming systems, reinforcing and supporting the efforts of individual farmers already having a go, and exerting others to become more involved, or at least better informing them of the issues (Cock 1992). Landcare groups thus generate commitment to the goal of sustainability at an individual and community scale, and they play an increasingly important role in gathering and managing information, in education and raising awareness (Campbell 1994a). There is some evidence that Landcare groups have enabled new things to be tried which would have been unacceptable in the past, and have ensured faster and wider dissemination of results and learnings (Curtis et al 1993). Landcare groups re-establish a community focus, creating networks for social support, for sharing the stress of rural decline, and for doing something constructive about it (Carr 1994). Landcare groups provide a useful structure, at an ecologically and socially sensible scale, for more efficient and effective use of government, private and community resources.

While the potential of Landcare is extraordinary, it is ultimately limited by its social, economic and institutional context. The growth of Landcare has been such that institutional support has struggled to keep up. In a time of economic crisis for many rural

communities it is easy to become cynical about the depth of government commitments to Landcare, and to see the talk of ‘empowerment’, ‘community based approaches’ and ‘bottom up’ as hollow—a clever means for the state to shift responsibility for land degradation to a community level, without allocating commensurate resources (Campbell and Woodhill in press).

Landcare’s growth can be expressed in ways other than the exponential increase in the number of Landcare groups. It is difficult to define the boundaries of the Landcare movement, because there is now a broad spectrum of initiatives in which people are directly involved in natural resource management in new ways and new configurations. The most notable of these is an extraordinary range of initiatives in community environmental monitoring, aimed at enhancing awareness, skills and capacities in local environmental management, for which I believe the best term remains Land Literacy.

Land Literacy

Land literacy is the intended outcome of activities designed to help people read, listen, learn and appreciate the signs of health (and ill-health) in a landscape, to understand the condition of and trends in the environment around them, and to make the invisible, visible. The idea is hardly new. For most of human history the ability to read and interpret the signs of nature has been an art or craft crucial for survival. However since the agricultural revolution, and particularly since the industrial revolution, humans have become progressively more insulated from the immediate need to be able to read and understand nature in order to eat, be clothed or find shelter. Such skills still reside within some indigenous communities and are being re-learned and rediscovered by people seeking alternative forms of land management.

The personal and direct involvement of people in gathering and interpreting information about the health of the land around them as an everyday activity seems to be inextricably linked with an accompanying ethic—of land stewardship, and respect for and humility towards nature. Such an ethic both underpins and is invigorated by contact with, and understanding of, the natural world. Such an understanding comes with direct involvement in gathering and recording information about vital signs such as water quality, the extent and status of indicator species, problems such as soil salinity and erosion and so on. A land ethic alone may be insufficient to guarantee sustainability, but it is a very good start. Sustainability is a pipedream without a land ethic as a foundation stone (Leopold 1949, Berry 1977, Jackson 1980, Roberts 1993). Land literacy provides a link between the development of an ethic, and practical actions to understand, and then improve the human management of, natural resources.

Many of the most important land degradation problems in Australia (soil acidification and structure decline, nitrate and phosphate contamination of groundwater, eutrophication of rivers, lakes and estuaries, rural tree decline and loss of biological diversity, for example) are complex, insidious and not startlingly obvious. Or, when they do become obvious, it is often too late to do much more than take graphic photographs and contemplate the horrendous cost (and often ecological impotence) of rehabilitation. For land degradation problems, it is wise to assume that prevention is always cheaper and more effective than cure, and it is invariably more efficient and effective to focus on causes rather than symptoms. But it is difficult to get people excited about prevention or a serious analysis of causes if they do not appreciate the problem.

Land resource assessment and monitoring does not have to mean specialist survey teams using complex instruments with unpronounceable names, producing beautiful maps for government files, never to be seen by the people who actually manage the land. There are more exciting and useful ways to generate and use information about the condition of natural resources, ways which can lead to direct improvements in management.

Initiatives in Land Literacy

Some of the land literacy activities occurring in Australia in conjunction with Landcare include: **farmer fly-overs**, enabling farmers to see their catchments and farms from the air at times when land degradation trends are most visible, often with a profound impact on their perceptions; **making the invisible, visible**—publications which better assist land users to recognise emerging problems, for example soil salinity and soil structure assessment kits and farm monitoring handbooks; and **community environmental monitoring**, exemplified by the various ‘watch’ programs. Case studies of such programs are presented and discussed in Campbell (1994a). There is room here to introduce only a small sample.

Saltwatch began in 1987, as a participatory community education initiative conceived by Terry White of the Victorian Salinity Bureau. By 1992, more than 900 schools and 50 Landcare groups were involved in gathering and analysing tens of thousands of water samples from creeks, rivers, reservoirs, irrigation channels and bores (White 1992). Each school or community analyses its data and sends it to a central agency for processing, receiving in return a computer-generated overlay map of water quality in the district—displayed in the school and often the store, the hall or the pub. Data is stored on school computers as well as in government agencies, and groups are encouraged to look at trends over time within their district. The composite maps are used for interpretation, discussion and planning further action such as excursions, rehabilitation projects and interpretative displays. Schools and community groups have access to education kits, manuals and curriculum materials, and training programs for teachers have been developed over recent years (Campbell 1994a).

Terry White, Jason Alexandra and Sandra Haffenden have compiled a comprehensive contemporary overview of community environmental monitoring programs (White *et al* in press), portraying a land literacy scene of great diversity and activity in a wide range of contexts, growing surprisingly fast in unforeseen directions, surpassing official policies and budgets. They document more than 200 different community-initiated programs. It is difficult to be precise about the number of programs or participants, as many of the respondents to their survey were networks of initiatives, rather than individual groups: suffice to say that there are at least 250,000 Australians involved, about two-thirds of them students. The types of activities undertaken include monitoring fauna populations (96 of 200 programs, half of them focusing on birds), flora (70 programs), water quality (65 programs, the fastest growing sector) and land use (52 programs), with a handful also monitoring air pollution and climate. Waterwatch programs now involve almost 1000 schools, and in the state of New South Wales alone it is anticipated that an extra 100,000 five-to-eight year old students will join water quality monitoring programs in each of the next three years (White *et al*, in press).

The major value of land literacy programs is the speed and effectiveness with which they transmit local environmental knowledge and teach people to observe and monitor—to read and listen to—the health of their landscape. These programs provide seminal experiences for the participants, they influence social norms and they can sensitise a human population to its relationship with the land from which it lives, exposing communities to their ‘ecological footprint’ (Rees and Wackernagel 1994), at a salient scale.

An example of a land literacy initiative on a local scale is the roadside vegetation survey carried out by the West Hume Landcare group in south-eastern Australia in 1994 (Campbell and Woodhill in press). The West Hume area has lost 99% of the forest cover which existed at the time of European settlement, mainly through clearing for agriculture. In such areas, roadside remnants are often the last examples of particular plant communities. They are thus ecologically critical, both as habitat for birds, marsupials, reptiles and invertebrates, and as repositories of local genotypes which can be used for revegetation and improving the habitat value of other nearby remnants. Remnant stands are also priceless from a land literacy perspective, as they enable current generations of land users to observe, seek to understand and to ponder upon the difference between the ecology of the roadside vegetation, and that of the

adjacent monocultural pasture or crop, and consequently the impact of European agriculture in Australian landscapes. Changes in biological diversity, in soil fertility and structure, and occasionally (near larger remnants) in water quality and hydrology, can be appreciated to advantage in the contrast between farmland and the islands of bush remaining. This contrast has been described by landcare facilitator Keith Bradby as ‘ecological apartheid’ (Campbell 1994a).

The West Hume landcare group organised 38 local volunteers, a cross-section of their community, to walk every road easement in their municipality, learning from botanists as they identified, recorded and mapped roadside remnant vegetation. It was a seminal experience for those involved—generating an outstanding level of participation and awareness of both the parlous state and critical importance of remnant roadside vegetation, and a dawning recognition by the municipality of the need to improve roadside management.

Through land literacy programs, land users are starting to collect and monitor information which was largely the province of specialists five years ago. Many Landcare groups and some individual land users are now familiar with technology such as piezometers, neutron moisture probes, aerial magnetometric surveys and electromagnetic detection of potentially saline areas. Geographic Information Systems were being used by 34 of the programs reviewed by White *et al* (in press) to integrate data from a range of monitoring sources and to represent it spatially (sometimes linked with Global Positioning Systems for accurate mapping at a catchment scale). More than one group in four claim to have developed their own monitoring equipment, which suggests that community environmental monitoring groups are a major source of innovation in monitoring (White *et al*, in press). People involved in gathering information are more interested in finding what it means and taking it seriously. They are more likely to follow through the implementation of local plans and strategies, and their activities generate the feedback necessary to check progress and refine directions. They can thus influence local management and behaviours relevant to the status of natural resources. They develop ownership of ‘their’ information, commitment to dealing with its implications, and are less overawed by the language and the aura of science and bureaucracy, enabling them to formulate more acute questions for scientists and regulators. In the words of White *et al* (in press);

“Noticing and recording changes in a local environment can lead to change itself because people have a direct relationship to their environment. They begin to have a stake in it. The measuring process is not an objective process because people, not machines, do the measuring. These same people often influence change. They are often in a position to translate insights into action as they are both monitors and managers—farmers, fishers, teachers, councillors etc”

Land literacy programs can thus generate potentially invaluable information which can inform management and policy at higher levels of aggregation. Community groups and schools can gather more data from more sampling points much more cheaply than is conceivable for government agencies paying professional staff—for example the Echidna Watch program (monitoring populations of the monotreme or egg laying mammal *Tachyglossus spp*) has 58,000 data points (White *et al*, in press).

The potential of land literacy programs has been under-rated, as there is a tendency to regard them merely as an innovative form of environmental education—a useful tool to get students out into the countryside. Incorporating such programs as an integral component of ‘official’ national natural resource assessment and monitoring programs and catchment planning processes would make better use of the policy learning potential of community environmental monitoring. This will require more rigorous procedures for data gathering, to make data quality more transparent, and to enable aggregation of at least a core suite of indicators. This in turn will rely on refined indices of ecosystem health and user-friendly methodologies for gathering, analysing and interpreting relevant data. Developing such indices and methodologies is an appropriate task for science and professionals in natural resource management, as is clear in other contributions to this volume.

A wonderful example of the way in which community-based environmental monitoring can deliver useful and scientifically robust data is seen every evening on the television news. Bureau of Meteorology weather reports and forecasts have for more than 75 years been based in part upon data sent in from more than 6,000 volunteer weather stations (one third of which are monitored daily) across Australia. There is no reason why we cannot evolve land literacy systems in schools and communities which provide feedback to society at large on issues from water quality to biodiversity management—data which is as trusted, as discussed in cafes and around breakfast tables, and as relevant to people's lifestyles as the weather—and much more relevant to most than share market indices or foreign currency speculation.

White *et al* (in press) liken land literacy systems to the instrument panels in cars and aircraft, providing simultaneous feedback on a range of indicators, each with a safe range and danger thresholds, and which together can be interpreted to identify dangerous trends and to improve management of the system. Modern industrialised societies have been largely decoupled from direct feedback from the environments which supply their inputs and amenities and which assimilate their wastes. Environmental 'instrument panels' generated by a wide cross-section of voters through land literacy programs, at whatever scale, will be crucial to improving the skills of the pilots of spaceship earth.

So what does this mean for agriculture?

For an agricultural audience, the foregoing discussion may seem of marginal relevance. Think again. Rural landscapes, in the industrialised democracies at least, are no longer the exclusive province of farmers, agriculture and agricultural professionals. Modern rural landscapes are as much locales of consumption as they are of production (Marsden *et al* 1993). Put another way, the products of rural areas include attractive landscapes, clean air and water, refuges for wildlife (and for escapees from city life) in relatively undisturbed habitat, and of course food and fibre. Societies' expectations (in terms of their 'ecological footprint') of the food they eat and the fibre they wear, are also changing, especially in the rich industrialised countries. Crises such as the banning of British beef in Europe in 1996 will become more common as consumers become more aware and demanding of the ethical and environmental dimensions of food and fibre production. How agriculture reacts to and anticipates such demands will be crucial over coming years.

Farmers and agricultural professionals will increasingly be judged on their competencies in natural resource management in the broadest sense, not just on their efficiency in producing food and fibre. 'Good' farmers of the future should be able, for example, to list the frog species living on their farm, describing their habitat requirements and understanding the on-site and off-site impacts of their farming operation on wetlands. Given the inexorable decline in real terms in commodity prices and the shrinking of agriculture's share of GNP in most OECD economies, the political influence of agriculturists will depend on the extent to which they can form coalitions with other stakeholders interested in rural landscapes—stakeholders likely to be concerned about much more than farm productivity. Social, ethical and ecological concerns have already influenced economic signals received by farmers and the penetration of such concerns into farm management will accelerate over coming decades.

Professional farmers of the future will see themselves (and be seen by others) as natural resource managers, gardeners of rural landscapes and stalwarts of rural communities, integrating a diverse range of enterprises; only some of which will be food production, and all of which could be informed and underpinned by the kind of ecological and social sensitivities generated through community-based land literacy programs. Agriculture must be, and be seen to be, a constructive participant in such initiatives—not a bemused or paternalistic bystander.

Farm Management 500

Farm Management 500 (FM500) is a privately organised project involving some 480 farm families in 40 groups in south-eastern Australia, supported by fifteen private consultants and a resource network of industry experts. It started in 1986, expanding rapidly from 1992, with a mix of private and government funding. The aim of FM500 is to increase the viability of both farms and farmers by harnessing the power of group learning among peer groups of farmers, facilitated by experienced consultants. Each group meets four to six times per year in members' homes, and groups combine for occasional two-day regional conferences.

More than 60% of FM500 members use computers for managing information, a higher proportion than for Australian broadacre farmers in general. After an initial focus on farm financial management, FM500 farmers are now using paddock management programs and spreadsheets for recording many types of production data — including sap nitrate levels and grain protein levels, rainfall, soil moisture, weed counts and all financial inputs and outputs.

The development and implementation of a five-year business plan by each of the families involved is central to the FM500 project. The FM500 team suggest that a good planning process must challenge farmers to be critical about their performance, recognising the rapidly changing environment in which farming operates, while setting realistic and achievable goals. The FM500 planning process has ten main subject areas: farm resources, family, finance, productivity, management, marketing, personal development, lifestyle, retirement and estate planning. The planning process in each of these areas has several components: a **situation analysis** — where are we now; a **strategic audit** — the business we are in and its strengths, weaknesses, opportunities and threats; **business objectives** — where are we heading; relevant strategies — how do we get from here to there; **implementation** — who does what, when and how; and **monitoring** — measuring progress and adjusting to changing circumstances.

FM500 contrasts with extension projects based on transfer of technology assumptions. The project is managed by private consultants who are paid by a combination of government and private sponsors to focus on the farmers' learning processes and knowledge management. Farmers are working in peer groups determined by social boundaries and they are responsible for generating, recording and storing information, of which they feel ownership. But the real power of the project is that it has access to 'real world' information gathered on a whole farm basis in a systematic way from 480 properties on various soil types, of various sizes and with varying management regimes and styles. This is a fantastic reference for group learning, as farmers compare their own data with that of others in their local group and for FM500 as a whole, with the technical assistance of the consultants and research scientists, who also appreciate access to information collected under a great range of 'normal' farming conditions. Gathering comparable data from a range of farms over a range of seasons accumulates a wealth of priceless information for scientists interested in examining trends. Farmers learn as much from other farmers within the group as from the consultants and invited specialists.

Kondinin

The Kondinin farm improvement group started in Western Australia more than fifteen years ago and now has more than 5000 farmer members across Australia. Its basic aim is to share farmer knowledge among farmers. Several times each year, members are surveyed to find out their key information needs. The professional staff employed by the group then seek this information, usually by a combination of employing a consultant researcher and involving group members in surveying farmers' relevant practical

experience. Research results are circulated among members, and sold to the public in specific publications or the group's own journal. The group finances itself from members' subscriptions and the sale of publications.

The Kondinin group began with a focus on farm machinery and sheep handling equipment—practical issues where farmers felt they were poorly served by agricultural research and extension. They attempted to gather and disseminate innovations developed by progressive farmers. But, as the quality and usefulness of their publications has become well known, and because they are directed by farmers' expressed information needs, they have widened their focus to include issues such as revegetation, crop and pasture diseases, farm social issues, marketing and so on. They employ scientists as consultants where appropriate, but farmers set the parameters for research. Their credibility is such that they are now recognised and funded as a legitimate research organisation by national research and development corporations.

Emerging New Roles

Landcare has precipitated the emergence of new roles within Australian agricultural knowledge systems—facilitation and coordination—which are distinctly different from the roles associated with the traditional labels of extensionist and researcher. These new roles are described and discussed in more detail in Campbell (1994a) and Campbell (in press). The National Landcare Program has a large investment in 91 facilitators and 135 coordinators (1994 figures, Campbell in press). Facilitators tend to operate at the regional level within state land management agencies, working with a number of Landcare groups simultaneously, concentrating on group process, especially with emerging groups and struggling groups. Coordinators tend to be employed by active Landcare groups (usually with NLP funds), with a more practical focus on helping groups to develop and implement projects, although this often requires the application of group facilitation skills. Coordinators are often former group leaders, local people who work from home with their own car and phone and are paid on a part-time basis to do in a more professional way what they used to try to cope with voluntarily. Facilitators usually have some formal qualifications, not necessarily in natural resource management, although ideally a facilitator needs sufficient technical skills in land management to be able to assist groups to set technically sound goals and access appropriate advice. Both facilitators and coordinators are selected mainly on the basis of their energy, enthusiasm and ability to work with people. Their subsequent training in group facilitation techniques is at least as important as any prior qualifications.

This discussion focuses on roles, not people. It is quite feasible, in fact common, for one person to perform each of these roles at various times with various groups, or even with the same group. Recognising the appropriate mode of action is part of the art.

Facilitation

Essentially, the aim of the facilitator is to foster group synergy. This means helping Landcare groups to make best use of the human resources available, by acting as a link person within the group and the local community, and also between the group and outside sources of information and assistance. Facilitation in the Landcare context also means helping to develop a shared sense of direction among all the relevant actors. This requires sufficient insight into group processes to be able to assist groups to find and set direction, to identify factors preventing the group from reaching its potential, and the skills to work through these issues with the group, without imposing direction upon them.

Facilitation is much more a matter of skilled listening, asking the right questions of the right people at the right time, than it is delivery of technical information or packages. This can mean challenging farmers to open their minds to new possibilities, to new ways of looking at their situation, their resources and the options open to them. Facilitators are often ‘providers of occasions’, organisers of encounters designed to stimulate new ideas, new ways of thinking, new perspectives or new liaisons between groups and sources of assistance. The art of fostering group synergy is delicate. It involves knowing when to lead, when to wait, when to challenge, when to withdraw. It also requires empathy with the target stakeholders.

The word ‘target’ may jar in a discussion about something as apparently non-threatening as facilitation, but facilitation should be seen for what it is—a strategic intervention for a more or less well-defined purpose. Effective facilitators do not just sit and wait for things to happen. They think, they anticipate, they plan and they act, with an emphasis on action, rather than reaction. Carr (1994) described facilitators as ‘bureaucracy busters’—seeking technical information, clarifying regulations, diminishing the administrative workload of the group, linking groups with schools, advising on project submissions, providing a pathway for government to enlist group support in activities such as farm planning workshops, or developing a rural strategy. Good facilitators aim to work themselves out of a job, withdrawing as groups become self-reliant.

Involving the community can be time-consuming and frustrating and it is scary for people who are not naturally disposed to dealing with people and/or have not had relevant training (Campbell 1994a). Seen through the prism of technocratic institutional cultures, involving a range of stakeholders in an ill-defined, open-ended facilitation process is tedious, its outcomes are often intangible and its cost/benefits debatable. But the complexities of developing new ways of using the land which meet environmental, social and economic objectives mean that genuine stakeholder participation in generating, using and exchanging knowledge, in decision making, and in resource use negotiation, simply cannot be side-stepped or fudged.

The role of the facilitator is critical in bringing relevant actors to the table, in attempting to develop a shared problem appreciation among different actors, in exposing and building areas of agreement and resolving or mediating conflict, in sustaining involvement and assisting processes for marshalling information, negotiating and making decisions. This is clearly a value-laden, political role. Facilitators need to make explicit where they stand on the issues at stake. Being a successful facilitator often means being able to bring about changes in attitudes, processes and organisational cultures within the employing institution.

Over the longer term, survival as a facilitator necessitates a fine understanding of power. It also demands support networks to help facilitators deal with the inevitable onset of burnout. As noted by Wilkinson and Barr (1993), there is no magic button for eliminating conflict. Facilitation may enhance stakeholders’ appreciation of the perspectives and values of others, and may open the way for genuine dialogue and new responses to environmental issues. Ultimately however, facilitation of multiple stakeholders in problematic natural resource management situations is likely to be most effective in a sympathetic institutional context, in harness with complementary policy instruments such as regulation, economic (including market-based) incentives, education and training, in situations where problems are salient and consensus solutions feasible.

Coordination

Like facilitators, the one hundred or so Landcare group coordinators are also pioneering a new role, but at a local scale with a more tangible focus and clearly defined responsibilities than regional facilitators. Coordinators typically work for one group only, when the activities of the group have become too much for volunteers to handle alone. The role of the coordinator is to sustain the

momentum of the group, to keep members involved and to ensure that group plans are implemented. Coordinators assist group leaders to organise meetings, take an active role in planning and managing group projects, keep less active group members interested, and connect group members with sources of technical advice.

Coordination of resources is central to this role—for example organising farmer contributions to projects, seeking assistance from outside groups and organising cooperative efforts between a number of farmers or with other groups. In many instances, particularly in southern states, the coordination role is played by a former group leader, often a woman farmer, who is paid on a part-time basis to put more time into Landcare group activities than would otherwise be possible. The communication and inter-personal skills of coordinators are more important than their original academic training (or lack of it). Because they are local, coordinators' expertise tends to stay in the area, unlike extension officers. Coordinators usually learn on the job, receiving advice from extensionists, regional facilitators and other coordinators, and attending Landcare training activities (Chamala and Mortiss 1992). They are regarded as an asset by district extension workers and regional research scientists, as they can facilitate access to many farmers, providing logistics and organisation. The expert just has to turn up on the day.

Prognosis for Participatory Approaches

The development of participatory approaches in land management research and extension in Australia in the late 1980s and early 1990s has been rapid and multi-faceted. Much has been learned by the land users and professionals involved. However there is emerging evidence that the effectiveness of such approaches is limited by social, cultural, institutional, structural and technical constraints. These are explored in depth in Campbell (1994a) and Campbell and Woodhill (in press). They include: limited human resources in rural areas, stressed by rural decline; a lack of technically sound, practical and profitable solutions to land degradation problems; institutional cultures within research and extension agencies which militate against genuinely participatory approaches; the overwhelmingly technocentric training of professionals in research and extension in Australia (Reeve et al 1988); the sentiment held by many farmers of feeling blamed for land degradation, a feeling which does not foster a stewardship ethic; and finally, the essentially colonial structure of Australian agriculture, producing raw products which are processed and marketed abroad, means that Australian farmers are completely exposed to declining terms of trade on markets distorted by subsidies in competing countries.

On the other hand, there remain great opportunities to consolidate and expand the use of participatory approaches in research and extension, and compelling reasons for so doing. The imperatives of the quest for sustainability—the temporal and spatial scale of problems; the inter-dependence of ecological, economic and social issues; the degree of technical uncertainty and risk; and the knowledge-intensive nature of more sustainable farming systems—suggests that land users need to be involved in all types of knowledge processes in agriculture, working with professionals in new types and combinations of roles. Professionals in agriculture then, or at least many of them, need to be developing insights and skills as 'facilitators of knowledge processes' (Röling 1992) or as 'process brokers' (Scherl et al 1994), moving beyond the narrow linearity of conceptualising 'research' and 'extension' as separate and sequential, if they are to remain relevant in an arena characterised by accelerating change.

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