

# **Agricultural extension policy in Australia: the good, the bad and the misguided<sup>†</sup>**

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In most states of Australia, agricultural extension policies and practices have increasingly been based on considerations of private/public goods, user pays and cost recovery. In addition, the delivery of extension has been strongly influenced by changing administrative structures and a change in the paradigm within which the extension community operates. These changes have had major impacts, including more extension being delivered by the private sector. There are positive aspects to the changes and, for some issues, they are appropriate. However, we have a number of reservations, particularly about the effectiveness of current extension systems in assisting the adoption of complex environmental and farming system technologies.

## **1. Introduction**

Over the last decade, economists' ideas about market failure, crowding out and the inefficiencies of taxation have strongly influenced changes in the role and delivery of government-funded agricultural extension. Rapid change is occurring at the Federal level and in all states of Australia. The changing

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<sup>†</sup>An earlier version of this article was presented at the 42nd Annual Conference of the Australian Agricultural and Resource Economics Society, University of New England, Armidale, NSW, 19–21 January 1998. The authors are grateful to two anonymous referees for their helpful suggestions, and to the Rural Industries Research and Development Corporation for funding. A large number of people contributed help and information for the study. We thank all contributors, but particularly Roslyn Prinsley, Ian Crooks (Crossfield), Ian Crooks (SBS Rural Iama), Janice Timms, Barry Windle, Warren Straw, David Hartley, Les Murdoch, John Blake, Tony Gleeson, Warwick Ford, Simon Foley, Ray Kernick, John Cameron, Mark Evans, Richard Scott-Young, Mike Darby, Jay Cummins, Jeff Coutts, Gary O'Connor, John Boomsma, Amabel Fulton, Ken Dowsley, Len Stephens, Scott Keyworth, Don Burnside, Frank Walker, John Cary, Bruce Muir, Mike Stephens, Alan Walker, Nigel McGuckian, Gary McKenzie, Peter Cook, John Bourne, Ian Maling, Eddy Pol, Chris Sounness, Paul Crock, Clay Manners, Jim Fortune, Roger Hartley and Don Plowman.

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agricultural extension environment in Australia reflects a worldwide trend towards the privatisation<sup>1</sup> of agricultural extension services (Johnson *et al.* 1989; Rivera and Gustafson 1991; Dancey 1993). This trend appears to be related to factors such as the declining relative importance of agriculture in the economy and budget pressures on governments, as well as the increasing influence of economists' theories and prescriptions within government. However, it is true that some of the changes are not limited to agricultural extension, or even to agriculture. In part, the changes reflect evolving views about government's role in the economy.

Agricultural information is increasingly being perceived by policy-makers to have 'private-good' characteristics. As farming has become more specialised, farmers are requiring more sophisticated and individually-tailored technical, management and marketing information. Information that is of value only within a local region or, especially, on a single farm lacks most or all of the public-good characteristics historically used by economists to justify government investment in agricultural extension. Without this justification, government investment would be likely to be economically inefficient, and Rivera (1996, p. 152) refers to 'the onslaught of conservative ideology emphasising efficiencies over welfare'. This 'onslaught' is associated with an ideological shift by governments to principles of 'user pays' and accountability. However, while increased efficiency is often touted as the reason for privatising public sector services, a desire for a reduction in government spending frequently lies behind this reasoning (Vanclay and Lawrence 1995; Cary 1998).

In the expressed desire to have a better (i.e. more relevant, more efficient, better targeted) extension service, governments have revitalised existing systems and, in some cases (e.g. New Zealand and The Netherlands), privatised public extension (Rivera 1996). Policy changes made in the 'revitalisation' of public sector agencies have included decentralisation, implementation of the 'Funder-Purchaser-Provider' model,<sup>2</sup> instigation of cost-recovery mechanisms, cost sharing, and participation of stakeholders in development of initiatives and in other decisions that affect them.

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<sup>1</sup> Cary (1998) notes that the concept of 'privatisation' is used fairly loosely when applied to the restructuring of agricultural extension and can include a variety of measures other than a full transfer of ownership of the agency to the private sector. These can include contracting out ('out-sourcing') delivery of the service to the private sector, as well as cost recovery measures undertaken within the public sector agency.

<sup>2</sup> The Funder-Purchaser-Provider model is based on the theoretical separation of, or distinction between, the 'purchaser' and 'provider' of services. The concept is to create a market in the provision of services, with the aims of improving accountability, reducing conflicts of interest and achieving the efficiencies usually associated by economists with markets.

In countries where public sector retrenchment is reasonably advanced, a multitude of alternative service providers and institutional arrangements has appeared (Carney 1995). Indeed, agricultural extension in many countries in the 'new extension environment' has come to encompass a wide range of activities in both the public and private sector. Accordingly, we define agricultural extension broadly to include public and private sector activities relating to technology transfer, education, attitude change, human resource development, and dissemination and collection of information. It includes off-farm as well as on-farm players in agricultural industries.

In this article we critically review the changes occurring in Australian agricultural extension up to mid-1999. The next section is broadly descriptive of the key changes. Criteria by which these changes may be assessed are discussed, followed by a critical assessment of the changes. The final section summarises the main conclusions.

## 2. Changes to agricultural extension in Australia

Australian agricultural extension has, until recently, been characterised by a large and effective public sector with a strong emphasis on production-based technology transfer (Cary 1998). State Departments of Agriculture have historically been the major providers of production-oriented agricultural extension services. However, changes in these agencies in recent years have been substantial (Watson 1996a).

It has been observed that the biggest reductions in state services to farmers have been in traditional areas of extension delivery (Watson 1996b; Whelan *et al.* 1996). On the other hand, Coutts (1997) argued that if new areas such as Landcare are considered to be extension, then the total level of resources devoted to extension delivery in the public sector has fallen little, if at all. Nevertheless, cutbacks in funding for traditional areas of activity for agencies have put pressure on State Departments of Agriculture to review the services they provide. Watson (1996a, p. 38) considers that, 'In the process, there has been a considerable loss of professionalism and neglect of the traditional roles of departments of agriculture.'

It does not necessarily have to be a negative development that 'traditional roles' have been neglected. Despite the cutbacks in services provided by public agencies, they are all still providers of extension services, although in some cases they are moving rapidly towards becoming coordinators of extension service providers. State agencies are still generators of information through their research programs, and so have responsibilities for ensuring that dissemination of this information occurs, even if it is delivered by others.

A further development, in part caused by changes in state public sector agricultural agencies, has been that the Research and Development

Corporations (RDCs) are taking a more pro-active role in extension. The charter for the RDCs as listed in the Primary Industries and Energy Research and Development Act 1989, includes a role to facilitate the dissemination, adoption and commercialisation of the results of research and development. Until recently only relatively small amounts of resources had been allocated specifically to technology transfer, but it has now been specifically recognised and funded as part of the research process (Cary 1998). Accordingly, the RDCs are playing an increased role in extension by coordinating technology-transfer initiatives, such as crop monitoring and herd/flock performance measuring systems (e.g. through programs such as *Topcrop*<sup>®</sup>, *Prograze*<sup>®</sup>, etc.).

A shift in control of and responsibility for extension activities is becoming evident with this developing role of the RDCs and other nationally funded programs as coordinators and 'wholesalers' of information marketing activities. Funding bodies are increasing their control and direction of research/extension agendas by funding demand-driven research and extension that matches the RDCs' priorities.

## 2.1 Changes in the physical operations of State Departments of Agriculture

The following points illustrate some of the changes that have occurred within Australian agricultural agencies in recent times. Not all these policy measures have been instigated by every State Department of Agriculture. Marsh and Pannell (1998) discuss these policy changes in more detail.

- *Regionalisation.* By 'regionalisation' we mean an explicit policy to move people, resources and decision-making from cities and urban areas to rural areas. There is evidence of regionalisation policies in some states, but not all states are pursuing it vigorously.
- *Formation of industry partnerships.* All State Departments of Agriculture are moving towards a 'market-driven' or 'client-driven' philosophy of service provision. That is, they have explicitly stated objectives of being responsive to the expressed needs of their clients, and some are setting up formal links with industry to attempt to ensure that industry needs are met (e.g. see Marsh and Pannell 1998).
- *Implementation of the 'Funder-Purchaser-Provider' model.* Most State Departments have adopted various interpretations of the Funder-Purchaser-Provider (FPP) model (see footnote 2), although NSW Agriculture is a notable exception. For most state agencies the FPP system means being required to clearly separate and distinguish the agency's role as a purchaser of services on behalf of the government from its possible role as provider of those services.

- *Outsourcing.* The adoption of the FPP model has enabled the agencies to engage in ‘outsourcing’, or the contracting out of services. Agricultural consultants and contract staff are now able to be employed to deliver required extension or research, if it is judged that they can do this more efficiently or effectively.
- *Instigation of cost-recovery mechanisms.* To varying degrees all State Departments are moving towards privatisation (i.e. adopting a ‘user pays’ philosophy), particularly with services seen to have private benefit (e.g. see Marsh and Pannell 1998). A general development is that the public sector is starting to charge for the delivery of information, but not the information itself. Most agencies, however, are still grappling with how and on what basis to recover costs.

Additionally, other changes have occurred. State Departments of Agriculture and primary industries have been restructured with various degrees of integration or separation from natural resource management state institutions, and various degrees of separation between research and extension. While Victoria, for example, has just one organisation (Department of Natural Resources and Environment — DNRE), other agencies have kept natural resources or forestry outside the agriculture portfolio. In Tasmania and until recently in South Australia, extension has been completely separated from research, with all research being undertaken within a separate institution. Such separation appears to run the risk of researchers becoming remote from current farming problems and the perspectives of farmers.

## **2.2 Changes in the philosophical approach to extension in state public sector agencies**

Government agencies are still very involved in extension, but the focus of their extension has changed somewhat.

### *Changing emphasis of extension activities*

The change in focus has occurred in two ways. First, there has been a withdrawal from areas perceived to be adequately supplied, or having the potential to be adequately supplied, by the private sector. This is partly because of funding restrictions but also because of policy directives to address areas of public rather than private good. Agencies are also withdrawing completely from the provision of some services or charging for ‘private-good’ services in line with their moves towards encouraging the adoption of the ‘user pays’ philosophy.

Second, there is a developing emphasis on activities that focus on human resource development. There currently exists a theoretical tension as to

whether extension should be 'person-focused' or 'technology-focused', and a developing emphasis on the former. There is a tendency to treat the two paradigms ('farmers'-needs pull' versus 'science-push') as mutually exclusive (Cary 1993). This tension has spawned an increasing emphasis on the development of human capital resources.

The growth of extension activities directed towards Landcare and human resource development reflects both the amount of funding for these activities that has become available through the National Landcare Program, and also a change in philosophy about the types of extension services needed by Australian farmers (Queensland Department of Primary Industries 1990; Simpson 1993).

#### *Developing emphasis on group-based activities*

The increase in group-based activities for agricultural extension is only partly a response to agency cutbacks. There has been a change in extension ideology away from the 'linear model' of 'top-down' technology transfer, to extension methodologies that emphasise information flows, adult learning principles and participation by stakeholders (Röling 1988; Knowles 1984; Chamala and Keith 1995). Under the new paradigm, it is seen as appropriate that farmers should have more control over the information that they need or want and over the way it is delivered. It is held that extension should be 'demand-pull' rather than 'science-push'. Increased use of farmer groups for agricultural extension has been one major change associated with this new paradigm. Extension officers now often act as facilitators rather than as experts in science or technology. The number of groups in which farmers can, and often need to, participate has grown rapidly. All State Departments of Agriculture now focus primarily on farmer groups rather than one-to-one extension.

The concept of Landcare as a national agricultural agenda is a comparatively recent development in Australian agriculture. Landcare first started as an organised program in Victoria in 1986. The number of voluntary Landcare groups, operating throughout rural and urban Australia has exceeded initial expectations. The Federal Government initially hoped that there would be 1,200 Landcare groups by the year 2000. This number was exceeded in 1993, and there are now in excess of 4,500 Landcare groups. Overall, an estimated 34 per cent of Australian broadacre farmers are involved in Landcare groups (Mues, Chapman and Van Hilst 1998), and percentages are higher than this in some states (e.g. Victoria and Western Australia).

Although many organisations, including farmers' organisations, community groups and private companies, are actively involved with Landcare groups, government agencies have played a large role in coordinating and providing extension to Landcare groups. Some selected catchments have also

received large injections of private sector capital over a number of years. For example, Alcoa has provided capital for projects and activities in selected catchments in WA since 1989, and the Woody Yaloak catchment in Victoria since 1992.

The advent of 'brand name' groups (e.g. *Target 10*<sup>®</sup>, *Topcrop*<sup>®</sup>, *Prograze*<sup>®</sup>) is a comparatively new development. However, they have been embraced with enthusiasm by the RDCs, who are using them to disseminate the results of their funded research. The desire for industry partnership has contributed to the push for development of the 'brand name' approach. 'Brand name' extension is mostly oriented towards technology transfer and is essentially seen by the RDCs as information retailing. *Target 10*<sup>®</sup>, for example, was originally conceived as a dairy extension project focusing on the benefits to dairy farmers of maximising the consumption of pasture; *Topcrop*<sup>®</sup> is dedicated to 'best practice' in grain-growing enterprises through its crop monitoring packages.

The use of Local Best Practice (LBP) groups as an extension medium in Australia is also relatively new.<sup>3</sup> Local Best Practice groups have achieved a deal of success in Queensland where the Queensland Department of Primary Industry (with Meat Research Corporation support) has been instrumental in fostering best-practice groups with beef producers. The concept of Local Best Practice is theoretically based on an action learning approach. Action research aims to understand a situation of concern by simultaneously taking action to improve it (as an iterative consequence of the new knowledge gained) (Blackett 1996). Proponents of learning-based systems such as this consider that for complex farm management issues (e.g. rotation farming, natural resource and catchment management, understanding business viability), farmers' inaction is caused more by a lack of shared understanding of the problem than lack of awareness of scientists' solutions.

Landcare and other existing groups have been supported by a national human resources development program initiated by the Commonwealth and State governments, the Property Management Planning (PMP) campaign, which commenced in 1993. Commonwealth funding for this program is provided by the National Landcare Program. Using facilitated workshop-based training sessions, PMP aims to improve the managerial skill levels of Australian farmers and graziers, and enable them to cope effectively with change (Nothrop 1996). The focus of the campaign is on facilitated group education using adult learning principles. In the first four years of the

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<sup>3</sup>There are, however, parallels with 'comparative analysis' groups which were prominent three decades ago, and which were strongly criticised by agricultural economists at that time (e.g. Mauldon and Schapper 1970).

campaign more than 3,500 workshops have been conducted nationally. All states are implementing their own versions of PMP according to their perceived needs, using various names to market the program (e.g. Farm\$mart, Farmwi\$e, Better Business).

#### *Developing emphasis on electronic transfer of information*

The use of the Internet and CD-ROMs to publicise research results and information previously only available in hard copy format (such as *AgNotes* or RDC publications) is being explored by many organisations. A limited amount of material from CRCs, RDCs, State Departments of Agriculture and private-sector researchers is available to download off the Internet. It is likely that within a short time, there will be a substantial amount of agricultural and environmental software available either free or for trial on the Internet. The amount of this available material will probably grow faster than it can usefully be exploited, given the access limitations in many parts of rural Australia.

### **2.3 Changes in who delivers and who funds extension**

The changes in organisation and emphasis outlined above have resulted in a decline in the relative importance of Departments of Agriculture as providers of agricultural information, primarily due to increasing private sector participation in delivery of agricultural extension services. Indeed, a vision for the future of extension services in Australia is 'for much greater involvement of the private sector, and for the public extension service to work hand-in-hand with agribusiness' (Sheldrake 1996, p. 4). In Australia, some of the many players in the new extension environment are farmer organisations; cooperatives and groups; seed, fertiliser and chemical companies; local government; marketing boards; Research and Development Corporations; Cooperative Research Centres; and university departments.

Partnerships have been institutionalised within the Cooperative Research Centres, and other formalised partnerships between agribusiness and public sector organisations and quasi-public sector organisations are becoming common. As a result of these developments, the private sector is taking a bigger role in agricultural research and extension, and getting a bigger input into policy and research priorities. Both these developments have previously been identified as being desirable (Prinsley *et al.* 1994). As a consequence, the private sector is showing an increasing tendency to invest in extension projects, often in conjunction with state or federally funded programs. Agribusiness is putting funds into national and state group extension projects such as *Target 10*<sup>®</sup> and *Topcrop*<sup>®</sup>. Alcoa, BP and Fuji Xerox have sponsored Landcare-oriented extension programs.



*A larger and broader role for agribusiness*

Agribusiness is playing an increasing role in the provision of extension services to farmers. Companies playing a major role include stock firms (such as SBS Rural IAMA, Elders Ltd. and Wesfarmers Dalgetys) and fertiliser companies (such as Pivot, Incitec and Hiferts). In addition to having a sales merchandising team, these companies also employ specialist agronomists whose responsibilities include trial work and associated extension activities, plus the provision of advice to individual farmers, often, but not always, linked to merchandise sales. Companies producing agricultural chemicals have large merchandising teams and are often involved in on-farm trial work when developing new products.

*Opportunities for consultants and agribusiness resulting from out-sourcing*

As the principles of the Funder-Purchaser-Provider model are implemented and out-sourcing of activities increasingly occurs within the public sector agencies, opportunities for private consultants and agribusiness to deliver government-funded research and extension programs are increasing. They have not been slow to grasp these opportunities. Private consultants in Victoria and NSW are running Farm Management 500 groups and delivering workshop material in conjunction with the national Property Management Planning program in those states. In WA, private consultants were involved in the planning of the state's version of *Topcrop*<sup>®</sup> and will be delivering some of the extension component of the program.

*Extension conducted by Cooperative Research Centres*

The Cooperative Research Centre (CRC) program was launched by the Federal Government in May 1990. CRCs are collaborative research ventures bringing together researchers from universities, the public sector and business. To mid-1999, there have been 15 CRCs concerned with agricultural or rural-based manufacturing research. One of the objectives of the CRC program was to encourage the building of effective networks of research facilities, scientists and industry associates, and indeed, the development of funding through CRCs has been instrumental in forcing the development of formal links among public institutions and between public institutions and industry.

Although CRCs are primarily research-oriented, their programs also have an extension component. Some have technology transfer components as a high priority within their activities (e.g. the CRC for Viticulture). Initially, many CRCs relied on their Department of Agriculture collaborators for delivering technology transfer activities. As the State Departments have changed the extent and focus of their extension activities, some CRCs

have been dissatisfied with the technology transfer activities conducted. Accordingly, they have looked to other ways of disseminating the results of their research, and have utilised their close ties with industry to do this.

### *Activities of farmer-controlled groups*

Large and small farmer cooperatives and groups exist in all states, and many of these undertake significant extension activities, such as field days, newsletters, seminars, etc. Many of them are associated with specific industries (e.g. marketing cooperatives, deer producers) but others have more wide-ranging interests (e.g. Agriculture Bureaux in South Australia, the Kondinin Group). Some of the groups playing a significant extension role appear to form because of specific problems caused by perceived isolation from services (e.g. Birchip Cropping Group in Victoria, Marsh and Maling 1997), the need for new technologies (e.g. Southern Farming Systems in Victoria), or the need to find 'like-minded' people who are committed to a certain practice (e.g. Western Australian No-Tillage Farmers Association).

## **3. Criteria for assessment of extension policy changes**

Later we provide some commentary on the merits of the policy changes outlined above. Where possible, the changes are considered against the following criteria, which we expand on in the following sub-sections.

1. Whether they are more or less consistent with what most economists would consider an economically defensible role of government. That is, a role that improves the efficiency of the economy by addressing market failures of various sorts.
2. Whether any given extension activity is provided at least cost to society.
3. Whether the changes are likely to improve the effectiveness of agricultural extension in terms of causing desirable changes in farming practices.

### **3.1 The role of government**

Government agencies, including agricultural agencies, are increasingly being asked to reconsider whether their activities are consistent with the objective of economic efficiency. To satisfy this goal, an activity must address an area of market failure, including public goods (i.e. non-rival goods or non-price-excludable goods), externalities (at least those involving public-good characteristics), and other information-related market failures (uncertainty, ignorance, misinformation). If it is possible to identify a case of market failure that is sufficiently strong to outweigh the costs of acting and the risk

of government failure, then a case exists for government intervention on efficiency grounds.

The crucial element in this intervention is that of coordination, control, or enforcement of rights. It may or may not be funded by government — that is secondary with regard to the achievement of efficiency. If a clearly defined group of beneficiaries of the intervention can be identified (e.g. all farmers, or a particular group of farmers), they might be required to bear the costs, on the basis that this is judged to be fair. However, this ‘user-pays’ approach does not necessarily have any bearing on the efficiency question unless, for example, it can be shown that the cost of collecting and administering the funds from the beneficiaries is different to that of the general tax system. In practice, this latter question is not asked.

A practical problem in trying to apply this ‘role of government’ criterion is that elements of market failure can be identified to support *all* types of agricultural extension. All extension is related to information, which almost always has public-good characteristics to some degree, and can always be claimed to be reducing uncertainty, ignorance and misinformation. Applying the criterion then comes down to assessing degrees of market failure, which is not often easy to judge.

The market itself can provide a partial solution to this dilemma. Even public goods provide private benefits, so private beneficiaries have a positive willingness to pay for them, provided they are sufficiently price-excludable. In general, provision by the private sector would be expected to be more efficient than provision by the public sector, due to lower costs. National Competition Policy is providing agencies with further impetus down this path by encouraging practices such as full-cost pricing in public agencies. Although the conceptual basis for full-cost pricing is flawed (Watson 1996b), it does at least reveal those extension services which can be provided profitably by the private sector. On the other hand, given the nature of much extension as a joint product with research, the exact services provided following private-sector capture of an extension activity would certainly be somewhat altered, and therefore difficult to compare in efficiency terms.

### 3.2 The cost of extension

In some cases, our comments will relate not to whether there is a market failure, but whether the market failure is being addressed at least cost. The characteristic of much public-sector extension, that it is a joint product with research, provides an argument that its marginal cost is low (and/or, as noted above, that the same service would not be provided privately). Transaction and administration costs arising from the policy changes are also considered.

### 3.3 The impact of extension

It is our belief that the impact of agricultural extension should be judged primarily on the basis of it achieving change through the adoption of changed practices or new innovations (as opposed to providing more generic learning skills, for which purpose there already exists a public education system). It is worth noting that some commentators on extension would contest this view.

The substantial literature on farmer adoption of innovations is of central relevance here. There is a wealth of empirical evidence on the factors that influence farmers' adoption of innovations (e.g. Rogers 1995; Feder and Umali 1993; Lindner 1987; Feder, Just and Zilberman 1985), and it includes some very clear-cut messages. Unfortunately, responding to these messages is often not straightforward. We can identify the conditions necessary to achieve adoption of an agricultural innovation (e.g. Pannell 1999), but it remains difficult to meet the conditions.

We suggest that the following lessons from the adoption literature are relevant to the consideration of extension policies.

- In *ex post* studies it has been found that adoption behaviour is generally consistent with the producer's self-interest (Lindner 1987).
- Profitability is an important element of self-interest, even for innovations intended to improve environmental or resource conservation (Sinden and King 1990; Cary and Wilkinson 1997).
- Extension has the potential to accelerate adoption, but seems unlikely to increase the final level of adoption, which is primarily determined by whether the innovation is in the farmer's best interest (Marsh, Pannell and Lindner 1996, 2000). It is very difficult to attribute any change in farming practices to any particular extension activities due to the multitude of social and informational processes in operation.

## 4. Critical assessment of selected extension policy changes

We provide our assessments under seven headings.

### 4.1 Group-based extension

The dominance of group-based approaches in modern agricultural extension in Australia raises many issues. Despite the positive attitude to group extension reported in a number of qualitative evaluations, quantitative data supporting the ability of group extension to change practices are still scarce. The lack of quantitative evidence is at least partly due to the fact that documenting quantitative changes and attributing them to extension is inherently difficult (Huffman 1978; Feder *et al.* 1987; Marsh *et al.* 1996).

Changes in practices are influenced by a wide range of factors, one of which could potentially be the extension method used. Vanclay and Lawrence (1995) consider that although there has been a growing commitment to group extension in Australia, this has occurred largely because of the disarray in traditional extension due to financial constraints and agency restructuring. They argue that it has not been because of any evaluation of the effectiveness of the new models to deliver more desirable outcomes. Woods *et al.* (1993, p. 67) also express this concern, noting that: 'Many claims are made about the effectiveness of groups, [although] the links are often tenuous and the basis for conclusions not clear.'

However, group-based extension done well appears to have many advantages because of its emphasis on adult learning principles and encouragement of producer 'ownership' of both problems and solutions. The group approach provides a framework for information delivery that especially enables information relating to a range of factors (e.g. production, environmental, sociological) to be integrated (Woods *et al.* 1993). Furthermore, it provides a means of consolidating stakeholder views and input from farmers within a cooperative environment. It has also facilitated the entry of rural people other than producers into agricultural issues, particularly in the Landcare program.

The success of such programs as *Target 10*<sup>®</sup> and *Topcrop*<sup>®</sup> illustrates that 'technology transfer' does not necessarily equate with a 'top-down' model of extension but can occur very effectively within a group approach where there is a considerable degree of producer control. In many instances the participatory process occurring in 'brand name' groups appears to be working well.

Nevertheless there are issues of concern regarding the increasing dominance of the group-based approach to extension. First, there are issues related to the representativeness of groups. The tendency for farmer groups to leave out some sectors of the community is well documented (e.g. Arnaiz 1995; Bebbington, Merrill-Sands and Farrington 1994; Ashby and Sparling 1994; Vanclay and Lawrence 1995). Farmers with greater wealth and larger properties are over-represented in group activities. Implementation of practical strategies for involving women in groups still lag behind the recognition of their importance, despite a reasonable amount of documentation from researchers on barriers to participation by women in extension activities (see Kerby *et al.* 1996, for a summary).

In the long run, as groups become the dominant form of contact between agencies and farmers, members of farmer groups will have a disproportionate potential to feed back into research and extension policy. It is, then, important to remember that some types of farmers are less likely to be involved in these groups. Some State Departments of Agriculture

acknowledge that they are now deliberately targeting 'top' (i.e. large and productive) farmers, and private-sector providers are also most likely to serve this group. The user-pays approach implicitly reinforces this segmentation strategy, biasing extension towards individuals and industries better able to pay (Vanclay and Lawrence 1995). This tendency has been observed in New Zealand following the commercialisation and then privatisation of public sector extension services (Walker 1995). For some situations (e.g. *Topcrop*<sup>®</sup> groups) it might be acceptable to acknowledge that those most likely to be participating are the '20 per cent of farmers responsible for 80 per cent of the production', and even target these farmers deliberately. In other cases, higher participation rates are required for extension objectives to be achieved, notably Landcare and industry protection initiatives (e.g. noxious weeds, farm safety).

Second, there are issues related to the ability of groups to address issues effectively. This is limited by the knowledge, perceptions, capacities and financial positions of members of the group. The group-extension approach relies, to varying degrees depending on the nature of the group, upon farmer awareness of their own problems. Vanclay and Lawrence point out that:

Reliance on farmers' local knowledge to solve problems that are new to their experience, such as environmental problems, is unlikely to be successful. The insidious nature of such problems means that farmers may still not recognise them — even after extensive damage might have occurred. While it is possible that many traditional problems may be solved with new extension methods, new problems, particularly environmental problems, may be best dealt with through a combination of new and traditional extension. The cost implications of this may not appeal to state governments which are in the process of dismantling the older forms of extension. (1995, pp. 125–6)

It is our view that, in Australia, excessive reliance *is* being placed on farmers' local knowledge via group-based extension to solve environmental problems which lie beyond the farmers' experience and, probably, their technical knowledge.

The Landcare group approach has proved successful in creating awareness and creating a good deal of acceptance of the 'landcare ethic'. It enables information and resources to be shared. The organisation of farmers into catchment groups to tackle conservation/environmental issues does potentially address some of the problems associated with externalities. In particular, it may reduce transaction costs involved in negotiating a Pareto improvement. It also recognises local knowledge, and enables producers to set their own priorities and strategies. However, it seems that governments and funding bodies still believe that extension through Landcare groups will be

sufficient to achieve widespread adoption of conservation practices. It seems clear from the adoption literature that unless the practices are actually in the farmers' own best interests, then this belief is misguided. For some large environmental problems, such as dryland salinity in the Western Australian wheatbelt, we believe that some of the technical solutions being promoted to farmers are not in their financial interest, even in the long run (Pannell 1999). This means that the extension program will be ineffective and, indeed, that extension is the wrong tool for the policy problem, at least at this time.

#### **4.2 Extension focusing on human resource development**

Experience in developing countries indicates that many benefits can arise from human capital development, especially with regard to group/program sustainability. However, the use of RDC funds for programs of this nature in Australia is open to question, particularly from the point of view of whether it is an appropriate role of government. Cary (1993), for example, argues that it is difficult to argue for government support for agricultural adult education when other forms of technical adult education attract a charge. Indeed, the current emphasis on farmer 'education' appears to be occurring with minimal liaison with education institutions, and little attention is given to the contribution that should be made through Technical and Further Education (TAFE) and higher education sectors. Furthermore, agricultural information centres seemingly blossom as though there is no regional library service in rural Australia. Farm counsellors are appointed outside the mainstream financial and personal counselling structures. All these points suggest that, even if further investment in human resource development is required, it is not being achieved at least cost. Gleeson (1997) suggests that these points are symptoms of a system that too often fails to identify desirable outcomes, who is responsible and which tools should be used to achieve those outcomes.

Those involved with programs such as the Meat Research Corporation's 'Working in Groups' project speak highly of their value. And indeed some reviewers of programs that emphasise technology transfer stress the value of the human resource development that occurred as part of the program (e.g. Coutts 1996). However, the general difficulties of evaluating extension are compounded for extension that focuses on the development of human resources. Typically, evaluation involves statements about changes in beliefs and attitudes as a result of participation in the program, rather than quantitative measures of changed practices. While we accept that such changes in beliefs and attitudes may be seen by some as valuable in and of themselves, they do not amount to changed management practices.

### **4.3 Increasing emphasis on nationally-based programs**

Above we described how a shift in control of and responsibility for extension activities is evident, with RDCs and other nationally funded programs having an increased role as coordinators and 'wholesalers' of information marketing activities. Watson (1996b) is concerned that this trend will lead to public funds being invested in ways that are less defensible from a 'role of government' perspective. On the other hand, national coordination is being touted by RDCs as a way of controlling extension linked to funded research, reducing duplication (and thus costs) and overcoming perceived difficulties caused by changes in state agencies that reflect differing political realities in each state.

This would seem desirable from a cost perspective, but there is a high potential for conflict between farmers, RDCs, public sector agencies and private sector stakeholders over how groups are to be used. There is some conceptual difficulty in coming to terms with an extension philosophy that purports to be 'farmer-driven', but only within the confines of imposed 'top-down' goals. This could eventually prove a problem for funders as groups opt out in order to control their own direction. We know of cases where this has already occurred and others where the conflicting interests of stakeholders in groups appear precariously balanced.

### **4.4 Organisational changes within public sector agencies**

Interdependence between extension and research is widely recognised. Evenson (1986) concluded that where there are poor links between research and extension programs, the results of research are not turned into productivity gains by extension services. Some Australian State Departments now seem to be deliberately weakening these links. Tasmania has separate institutions for research and extension, and in South Australia, the research institution, South Australian Research and Development Institute, has only recently been rejoined with Primary Industries and Resources South Australia.

Even in other states, the policy of reduced one-to-one extension, coupled with constraints on researchers imposed by the Funder-Purchaser-Provider system and other new institutional arrangements, seems certain to reduce the direct contact between farmers and public sector researchers. Although these policies are ostensibly consistent with an efficient role of government, that efficiency is threatened if the changes do not sufficiently recognise the jointness and inter-dependence of research and extension. Furthermore, the experience with Funder-Purchaser-Provider has been that it is a system fraught with very substantial transaction costs.



#### **4.5 Increase in the numbers of extension service providers**

The fact that private-sector extension providers have stepped in to fill many of the gaps created by public-sector withdrawal from certain areas (e.g. one-to-one advice on crop agronomy) indicates that withdrawal has been consistent with the efficient role of government criterion. However, the sheer number of alternative providers offering services provides a challenge to farmers and other clients wishing to use or even be aware of available options, and raises issues of information coordination and information availability. Information will be more fragmented as research is carried out by more organisations and intellectual property rights are sought. This presents two challenges. First, it is difficult to prevent information fragmentation and research duplication in this research environment. Second, many farmers are complaining of an 'information explosion' where information providers over-supply their information products in a market where there is no quality control. The need for data collection and coordination will become increasingly important and, in recognition of this, RDCs are examining the issue of national coordination of information collection and dissemination.

Lindner (1993) identified the relatively low level of free exchange of scientific information between private sector organisations having the potential to reduce the efficiency of private sector research, compared with research conducted by the public sector. The exchange of information between private and public sectors is now being affected by the rapidly growing emphasis on protection of intellectual property rights.

#### **4.6 Privatisation/commercialisation of extension services**

The policy shift towards encouragement of private-sector extension provision partly reflects a quest for increased efficiency, consistent with the 'role of government' criterion. Use of a public good/private good 'decision rule' is influencing the change in emphasis of publicly funded extension away from production-oriented extension towards conservation/environmental-oriented extension, notably through the increased availability of public funds for Landcare extension.

While this change has a defensible basis, we have a number of concerns that will become important if it is taken too far. First, the increased Landcare focus means that government is investing in areas where short- or medium-term economic returns are likely to be less than if they had invested directly in technology transfer for productivity-raising innovations (Cary 1998). It could mean that public-sector extension is left mainly providing services in areas where there are special difficulties. It is much more difficult

to achieve success in sustainability-oriented extension than productivity-oriented extension (Pannell 1999) and, furthermore, the lack of quantifiable results from sustainability-oriented extension is difficult to accommodate within the accountability models being implemented by public sector agencies.

Exacerbating this problem, the push of extension towards commercialisation appears to be a threat to the extension capacity of government agencies, as experienced and skilled extension agents are lost to the private sector at an unprecedented rate. In the long run it may come to be a concern that this loss of extension capacity reduces government's ability to influence desired outcomes which are not of a commercial nature. This has already happened in New Zealand where the government has realised that commercialisation has greatly reduced its influence over social change (Walker 1995). Since 1991 the government has required policy departments to undertake 'facilitation programs' in support of key government objectives such as economic growth, improved management of the environment, and social cohesion.

Interestingly, a number of the private-sector extension providers that have entered the market in the last decade provide their extension services to farmers for no fee (although costs of these services can be recouped through product pricing). The aim of these agribusiness firms is to engender loyalty among their farmer clients, and to encourage the purchase of farming inputs. The contrast between this 'free' provision by the private sector and the move in public agencies to introduce fees for some extension services is striking. It begs the question whether public agencies might be better to retain free provision of private-good information in order to better 'sell' their public-good and regulatory objectives.

#### **4.7 Electronic delivery of information**

A number of recent reviews explore and document the practical limitations of the Internet as a significant information tool for rural Australia (Buckeridge 1996; Easdown 1996; Groves 1996). Existing rural telecommunications infrastructure is recognised as limiting the ability of rural Australia to use online services effectively. For example, the National Farmers' Federation (NFF) *Farmwide OnLine* pilot project<sup>4</sup> has been valuable as an evaluation of current service provision and its ease of use. Only 58 per cent

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<sup>4</sup> *Farmwide* (a company wholly owned by the State member organisations of the National Farmers' Federation) received funding in 1996 from the Commonwealth Department of Housing and Regional Development to conduct a 12-month pilot project to trial the use of online services to rural inhabitants.

of the participants in the pilot trial were able to connect to electronic information services at speeds over 14,400 bps (R. Simpson 1997, personal communication).

It appears certain that electronic information services will be used for conveying some types of extension information to farmers. In particular, although there is still little marketing information on the Web, it seems an appropriate medium for this type of information that needs to be regularly updated. For other types of information, such as farm-specific agronomic or animal management advice, it appears to be less useful. We also note that many Australian farmers live with longer periods of solitude than most of us in non-farming occupations. If only for this reason, they are likely to resist technologies which reduce the level of human contact, as they appear to have done previously for other 'high-tech' approaches to extension.

## 5. Conclusion

Many changes in Australian agricultural extension policy do seem consistent, or at least potentially consistent, with an efficient role of government. The withdrawal of government extension services judged to be predominantly private goods has revealed that the private sector was indeed being crowded out of these markets. In principle, at least, public-sector resources should now be freed up to focus on areas where the market is more likely to fail.

The emphasis on group-based approaches in modern extension practice in Australia is broadly a positive development. It enhances the potential for farmers to learn about the potential relevance of changed farming systems or new innovations. It also allows farmers to work through the practical adaptation problems that are often associated with new systems and innovations with support from their peers and relevant experts.

Nevertheless, we contend that there is now an over-reliance on group-based extension. The disadvantages of group-based extension, particularly non-participation, make it inappropriate if over-relied on in areas where widespread involvement is required for extension objectives to be achieved, notably Landcare and industry protection initiatives. The effectiveness of group-based extension could be threatened by the existence of many groups, with too few that are genuinely worthwhile.

We are concerned that a number of factors are contributing to a weakening of productive two-way links between research and extension. These factors include separate institutional structures for agricultural research and extension, organisational changes within state agencies which are reducing contact between researchers and producers, and inadequate processes for feedback from private-sector extension to public-sector research.

There have been big changes in the type of extension conducted, consistent with the move towards government provision of public goods. A negative aspect of this is that privatisation of delivery may result in the public sector suffering loss of farmer respect and loss of good extension staff, so that achievement of public-good outcomes is made more difficult. Rather than splitting services between the sectors on the basis of public/private goods, it could be healthier for both sectors to be involved in delivering both public and private goods.

The current focus on the electronic delivery of information to rural Australia may be somewhat misguided, especially if it means that less information is available via conventional means. There are serious deficiencies in the telecommunications infrastructure currently available to much of rural Australia, and the nature of farming as a lifestyle means that farmers value information channels that also provide social contact.

We consider that it is, at best, extremely uncertain how effective extension activities emphasising human capital development will be in achieving measurable changes in practice. There are also questions about the appropriateness of delivering such activities through agriculture agencies independent of other agencies providing services of this type.

We are dismayed that government and funding bodies appear to believe that extension through Landcare groups will be sufficient to achieve widespread adoption of conservation practices. In particular we are concerned that there is a belief that farmers can solve difficult and complex land degradation problems themselves through group-based processes, even when it is apparent that the solution requires development of new technologies that are probably complex and possibly require support from off-farm sectors.

## References

- Arnaiz, M.E.O. 1995, *Farmers' Organisations in the Technology Change Process: An Annotated Bibliography*, Network Paper 53, Overseas Development Institute, Regent's Park, London.
- Ashby, J.A. and Sparling, L. 1994, *Institutionalising Participatory Client-Driven Research and Technology Development in Agriculture*, Network Paper 49, Overseas Development Institute, Regent's Park, London.
- Bebbington, A.J., Merrill-Sands, D. and Farrington, J. 1994, *Farmer and Community Organisations in Agricultural Research and Extension: Functions, Impacts and Questions*, Network Paper 47, Overseas Development Institute, Regent's Park, London.
- Blacket, D.S. 1996, 'When adoption theory fails', in Asghar, M. (ed), *Proceedings of the 8th Australian Agronomy Conference 1996, Toowoomba, Queensland, 30 January–2 February 1996*, Australian Society of Agronomy, Carlton, Victoria, pp. 104–7.
- Buckeridge, R. 1996, *Rural Australia Online*, Rural Industries Research and Development Corporation, Barton, ACT.

- Carney, D. 1995, 'The changing public role in services to agriculture: a framework for analysis', *Food Policy*, vol. 20, pp. 521–8.
- Cary, J.W. 1993, 'Changing foundations for government support of agricultural extension in economically developed countries', *Sociologia Ruralis*, vol. 23, pp. 336–47.
- Cary, J.W. 1998, 'Issues in public and private technology transfer: the cases of Australia and New Zealand', in Wolf, S.A. (ed), *Privatization of Information and Agricultural Industrialization*, CRC Press, Boca Raton, FL.
- Cary, J.W. and Wilkinson, R.L. 1997, 'Perceived profitability and farmers' conservation behaviour', *Journal of Agricultural Economics*, vol. 48, pp. 13–21.
- Chamala, S. and Keith, K. (eds) 1995, *Participative Approaches for Landcare*, Australian Academic Press, Brisbane.
- Coutts, J.A. 1996, 'Extension education: lessons from the field', in Australasia Pacific Extension Network Conference Proceedings, *Beyond Technology Transfer*, University of Melbourne, 5–6 December 1996, pp. 11–17.
- Coutts, J.A. 1997, 'Changes in extension — an Australian perspective: the coming of age of extension', in *Proceedings of the 2nd Australasia Pacific Extension Conference Vol II, Albury, NSW, 18–21 Nov 1997*, pp. 22–32.
- Dancey, R.J. 1993, 'The evolution of agricultural extension in England and Wales: some reflections', *Journal of Agricultural Economics*, vol. 44, pp. 375–93.
- Easdown, W. 1996, *The Role of the Internet in Rural Communities: Research and Development Opportunities for the Rural Extension Centre*, University of Queensland, Gatton.
- Evenson, R.E. 1986, 'The economics of extension', in Jones, G.E. (ed), *Investing in Rural Extension: Strategies and Goals*, Elsevier, London.
- Feder, G., Just, R. and Zilberman, D. 1985, 'Adoption of agricultural innovations in developing countries: a survey', *Economic Development and Cultural Change*, vol. 33, pp. 255–98.
- Feder, G., Lau, L.J. and Slade, R.H. 1987, 'Does agricultural extension pay? The training and visit system in northwest India', *American Journal of Agricultural Economics*, vol. 69, pp. 677–86.
- Feder, G. and Umali, D.L. 1993, 'The adoption of agricultural innovations: a review', *Technological Forecasting and Social Change*, vol. 43, pp. 215–39.
- Gleeson, T. 1997, 'The role of public sector extension', unpublished paper presented to an RIRDC-sponsored workshop, The New Environment for Agricultural Extension in Australia, Australian National University, Canberra, 17–18 September.
- Groves, J. 1996, *Policy Issues in Putting Rural Australia OnLine*, Rural Industries Research and Development Corporation, Barton, ACT.
- Huffman, W.E. 1978, 'Assessing returns to agricultural extension', *American Journal of Agricultural Economics*, vol. 60, pp. 969–75.
- Johnson, R.W.M., Schroder, W.R. and Taylor, N.W. 1989, 'Deregulation and the New Zealand agricultural sector: a review', *Review of Marketing and Agricultural Economics*, vol. 57, pp. 47–74.
- Kerby, J., McClure, L., Westley, A. and Young, M. 1996, *Valuing Women as Customers*, Technical Report 248, Primary Industries South Australia, Adelaide.
- Knowles, M. 1984, *The Adult Learner: A Neglected Species*, Gulf Publishing Company, Houston, TX.
- Lindner, R.K. 1987, 'Adoption and diffusion of technology: an overview', in Champ, B.R., Highley, E. and Remenyi, J.V. (eds), *Technological Change in Postharvest Handling and Transportation of Grains in the Humid Tropics*, ACIAR, Canberra, Proc. No. 19, pp. 144–51.

- Lindner, R.K. 1993, 'Privatising the production of knowledge: promise and pitfalls for agricultural extension', *Australian Journal of Agricultural Economics*, vol. 37, pp. 205–25.
- Marsh, S.P. and Maling, I. 1997, 'The benefits of building working partnerships between farmers and researchers: the case of the Cooperative Research Centre for Legumes in Mediterranean Agriculture and the Birchip Cropping Demonstration Sites', in *Proceedings of the 2nd Australasia Pacific Extension Conference Vol I, Albury, NSW, 18–21 Nov 1997*, Conference Design Pty. Ltd, Sandy Bay, Tasmania, pp. 719–26.
- Marsh, S.P. and Pannell, D.J. 1998, 'The changing relationship between private- and public-sector agricultural extension in Australia', *Rural Society*, vol. 8, pp. 133–51.
- Marsh, S.P., Pannell, D.J. and Lindner, R.K. 1996, *Agricultural Extension and the Rate of Adoption of Innovations: A Case Study of the Adoption and Diffusion of Lupins in Western Australia*, Final report for RIRDC Project UWA-11A, University of Western Australia, Nedlands, Western Australia.
- Marsh, S.P., Pannell, D.J. and Lindner, R.K. 2000, 'The impact of agricultural extension on adoption and diffusion of lupins as a new crop in Western Australia', *Australian Journal of Experimental Agriculture*, vol. 40, pp. 571–83.
- Mauldon, R.G. and Schapper, H.P. 1970, 'Random numbers for farmers', *Journal of the Australian Institute of Agricultural Science*, vol. 36, pp. 279–84.
- Mues, C., Chapman, L. and Van Hilst, R. 1998, *Landcare — Promoting Improved Land Management Practices on Australian Farms*, Australian Bureau of Agricultural and Resource Economics Research Report 98.4, Canberra, September 1998.
- Nothrop, L. 1996, 'The national Property Management Planning campaign and accreditation of facilitators', paper delivered to the AAAC 1996 Annual Conference Consulting Opportunities in the New Extension Environment, Canberra, August.
- Pannell, D.J. 1999, 'Social and economic challenges in the development of complex farming systems', *Agroforestry Systems*, vol. 45, pp. 393–409.
- Prinsley, R., Dore, J., Marks, N., McGuckian, N. and Thompson, P. 1994, *The Role of the Private Sector in Extension: A Report to the Research and Development Corporations*, RIRDC Occasional Paper No. 94/3, Rural Industries Research and Development Corporation, Canberra.
- Queensland Department of Primary Industries 1990, *QDPI Extension Policy Review*, Queensland Government, Brisbane.
- Rivera, W.M. 1996, 'Agricultural extension in transition worldwide: structural, financial and managerial strategies for improving agricultural extension', *Public Administration and Development*, vol. 16, pp. 151–61.
- Rivera, W.M. and Gustafson, D.J. (eds) 1991, *Agricultural Extension: Worldwide Institutional Evolution and Forces for Change*, Amsterdam, Elsevier.
- Rogers, E.M. 1995, *Diffusion of Innovations*, The Free Press, New York.
- Röling, N.G. 1988, *Extension Science, Information Systems in Agricultural Development*, Cambridge University Press, Cambridge.
- Sheldrake, R. 1996, 'Opportunities for private consulting in research and extension in NSW', paper presented at the AAAC 1996 Annual Conference Consulting Opportunities in the New Extension Environment, Canberra, August.
- Simpson, I. 1993, 'Rural extension: a change in emphasis', in proceedings of the workshop, *Defining/ Redefining Extension Practice*, Orange, New South Wales.
- Sinden, J.A. and King, D.A. 1990, 'Adoption of soil conservation measures in Manilla Shire, New South Wales', *Review of Marketing and Agricultural Economics*, vol. 58, pp. 179–92.

- Vanclay, F. and Lawrence, G. 1995, *The Environmental Imperative: Eco-Social Concerns for Australian Agriculture*, Central Queensland University Press, Rockhampton, Queensland.
- Walker, A.B. 1995, 'Some New Zealand observations on the two-way street of public and private extension', paper presented at the Dairy Horizons Conference, Melbourne, November.
- Watson, A.S. 1996a, *The Economics of Charging for Research*, Dairy Research and Development Corporation, Glen Iris, Victoria.
- Watson, A.S. 1996b, 'The price of research: understanding the economics of charging for research', in *Conference Proceedings, Contributed Papers, Global Agricultural Science Policy for the Twenty-First Century, 16–28 August 1996*, Melbourne.
- Whelan, S.P., MacAulay, T.G., Munro, R.G., Godden, D.P. and Batterham, R.L. 1996, *Alternative Funding Strategies for Rural Research and Development*, Research Report No. 14, Department of Agricultural Economics, University of Sydney, Sydney.
- Woods, E., Moll, G., Coutts, J., Clark, R. and Ivin, C. 1993, *Information Exchange: A Report Commissioned by Australia's Rural Research and Development Corporations*, Land and Water Resources Research and Development Corporation, Canberra.