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# AGRICULTURAL RESOURCE MANAGEMENT

R. G. DUMSDAY
*La Trobe University, Bundoora, Vic. 3083*

**Today the land economists of yore have either gone to their reward or else been transmuted into resource economists who, with a few exceptions, spend their time in airy disputations about externalities, shadow prices and the choice of appropriate discount rates to be applied to future benefits (Campbell 1982, p. 9).**

## *Introduction*

After reading the Group's report and its associated commentaries to date, one might be excused for suggesting that Campbell's complaint should be extended to encompass agricultural economists involved in airy disputations about trade protection and compensatory assistance. I will return to this matter later in the introduction.

In the chapter on agricultural resource management, the Group covered soil conservation, water resources and irrigation, weeds, pests and diseases, land-use, other environmental issues from agricultural sources, quarantine and animal welfare. These apparently disparate issues are all characterised by potentially significant external effects which may not be efficiently handled by traditional markets. For these reasons, most of the issues have a long history of government intervention with mixed results. The issues transcend both commodity and industry concerns, and both production and consumption activities. Their inclusion in a single chapter would seem to be a convenient arrangement.

Substantial contributions on resource issues were contained in about one-third of the submissions to the Group. Most of these contributions were in the areas of soil resources, land-use, water resources and animal welfare, in that order. Issues related to pest management (including environmental impacts of the use of chemicals) and quarantine attracted few submissions.

The intellectual and professional genealogy of agricultural economists specialising in resource economics has been described by Castle et al. (1981). Twenty-seven per cent (or 140 out of 518) of Australian Agricultural Economics Society members list resource economics as one of their (usually three) areas of specialisation (Australian Agricultural Economics Society 1980). In the decade 1973-82, 8 per cent of articles published in this *Journal* were in resource economics areas: an average of 1.2 articles per annum, with no apparent trend. In my view, only one of these (Randall 1981) made a substantial contribution at a level suited to applied policy analysis and advice. In short, while some Australian evidence appears to justify Campbell's chastisement in the opening quotation (made in an international context), a more important observation is that people trying to write Australian policy reports in the resource economics area will probably not obtain much support from work published by this Society.

The Group's failings in Chapter 10 cannot be laid entirely at the feet of

the (Australian) agricultural economics profession. In particular, I have difficulty with the thrust of this chapter as expressed in para. 10.2:

> Generally, the Group's approach to these issues is that where a specific public benefit can be identified public expenditure is justified. Further, the Group considers that these issues are so important as to justify a more positive role by the Commonwealth. The Group considers that, in general, agricultural resource management is an appropriate area for the increased assistance to the sector suggested in Chapter 4. (Chapter 4 is titled 'General Economic Policy Issues'.)

In the opening sentence of this quotation, the Group appears to ignore the content and implications of the 'polluter pays' and 'user pays' principles popularised by the OECD (1975) and others. In many cases, the efficiency effects of public subsidies for production of environmental goods, for example, may be little different from the effects of public taxation of environmental bads. The effects on income distribution may differ markedly between the two approaches, but the effects will not necessarily be inequitable. In other words, increased public expenditure may not be the most equitable, or efficient, way of obtaining benefits from, say, a soil conservation program.

In relation to the second sentence, the relevant question is not whether the issues are 'important' enough to warrant increased Commonwealth involvement. Many important issues can be best handled at state or local government levels. However, due to the presence of interstate or international externalities, or economies of size in organisational or institutional matters, other issues may be more 'appropriately' (efficiently) dealt with by the Commonwealth.

Finally, I would not like to see too much emphasis on 'income compensation' as a rationale for increased assistance to areas such as soil conservation and water resources. Lloyd (1978), Australian Rural Adjustment Unit (1982), Harris (1983) and Jarrett (1983), among others, indicate that issues such as trade protection and compensatory assistance are not yet firmly resolved. However, if there is a consensus, it appears to involve: pessimism that overall levels of protection will be reduced (the 'first-best' option) in the foreseeable future; the view that the efficiency effects of protection are likely to be small in relation to the distributional effects; and that the case for the distributional effects being inequitable to farmers has not yet been demonstrated. In any event, I have sympathy with Lloyd's (1978, p. 290) view that it might be preferable to place '. . . emphasis on improvements in technologies and the productivity of all resources rather than haggling over the allocation of existing resources used with existing technologies in the production of existing commodities'. Economists may have a comparative advantage in such haggling but they are also capable of helping to shape the efficient progress of technological change. As well, 'intervention' does not have to mean 'assistance' and I wonder at the emphasis being given to compensatory assistance issues, both by the Group and by some of those commenting on its report.

### *Soil Conservation*

Soil and water resources are closely related (and are likely to become increasingly so as concerns about water quality intensify) in a large

number of production and consumption activities. They probably should not be separated either in institutional arrangements for their management or in discussion of agricultural policy issues. However, in Australia, unlike the U.S.A., it is common practice to consider soil and water resources separately. The practice has recently been confirmed at the Commonwealth level by a decision to investigate the establishment of an Institute of Freshwater Studies (Department of Resources and Energy 1983, pers. comm.) rather than a previously mooted institute encompassing both soil and water resources.

The recent upsurge of interest in soil conservation in the U.S.A. appears to have been largely in response to the 1972 Clean Water Act which contained important implications for land-use practices (Dumsday 1983). The Australian Agricultural Council (1971) and the Department of Environment, Housing and Community Development (1978), appear to have stimulated increased interest in soil conservation in this country.

The Group touched on the difficulties involved in making rational decisions concerning soil conservation policy. The main difficulties lie in deriving measures of the extent and severity of soil degradation, the relationships between land-use and degradation, and between degradation, productivity and income over time. Economic evaluations of the private and public benefits of soil conservation are sketchy and no regional or national evaluations have been made on the scale seen in the U.S.A. (e.g. Boggess and Heady 1981). Even in that country there is widespread concern that the data base is inadequate and substantial efforts are being made to improve it (United States National Soil Erosion—Soil Productivity Research Planning Committee 1981).

The Group strongly supported increased funding for soil conservation, especially by the Commonwealth Government. They took the view that landholders should be asked to contribute only to the extent that they (directly) benefit from conservation measures. I believe this philosophy is misdirected. It can be argued that in Australia and the U.S.A., voluntary programs involving subsidisation of management practices and engineering works have not been an efficient means of achieving soil conservation. Williams (1979) has suggested that the US programs have had a significantly larger impact on income distribution than on soil conservation! It is time to place more emphasis on coercive measures to control land degradation and its associated pollutants, largely salt and sediment. (The latter is likely to transport other pollutants such as pesticides and fertilisers.) If it is felt that the data base is unable to support coercive programs, why should it be regarded as being adequate to justify public subsidisation of soil conservation works and practices?

The Group suggested (para. 10.22) that, in Victoria and N.S.W., the Soil Conservation Service and Department of Agriculture should be amalgamated. (Neither of the Services made submissions to, or were interviewed by, the Group.) The suggestion has been made before (e.g. by this commentator as part of a submission to the Harris et al. 1974 inquiry) and has some merit: it may lead to more consistency and less duplication in advice given to land owners. However, it is important to note that, in the U.S.A., soil conservation services have been administered by the USDA for some years and there are serious misgivings about the success of the union (see for example, Williams 1979). The main disadvantage is seen to be a conflict between the administration of

production and conservation objectives. The US Environmental Protection Agency is anxious to assume greater control over land-use in that country and may not have long to wait. On balance, soil conservation departments should be primarily responsible for the setting and policing of environmental standards and regulations in rural areas, with agriculture departments taking an increased role in education and extension.

### *Water Resources and Irrigation*

There seems to be a presumption among some experts that because we have already developed the lower cost sites for large-scale irrigation systems in Australia, we are now in a management phase and should not expect to see (economically justifiable) development of new systems. This presumption is based on physical rather than economic grounds and it makes inadequate provision for the possibility that technological change in the construction and operation of irrigation systems may reduce costs to the point where development of new schemes or re-development of old schemes is economically attractive. Even so, while existing irrigation systems still support significant components of highly protected industries, the emphasis on allocation and management issues is probably warranted.

The Group listed evaluation of new capital investment in irrigation works and water-pricing policies as two major water policy issues for the 1980s (para. 10.32). (The Group included discussion of water quality and interstate issues in the water-pricing category.) Agricultural and urban economists have been beating the drum on both these issues for many years and have seen some progress. The BAE and other institutions have played a role in assessing routinely proposals requiring public funding and the water industry seems to be generally conscious of the need for benefit-cost analysis of new projects.

The introduction of more rational pricing systems for resources, such as oil and natural gas, was followed quickly by the gradual introduction of 'user pays' systems in both rural and urban water markets. In N.S.W. we have even seen the recent introduction of a (limited and temporary) water transfer scheme (N.S.W. Water Resources Commission 1983). The Department of Resources and Energy (1983) also placed emphasis on the gradual introduction of pricing policies reflecting the pay-for-use principle. In addition, the Department attaches considerable importance to water quality issues and the need to consider them in conjunction with land-use and soil conservation programs.

The Group provided a good summary of the relationships between water quality (salinity) issues, water-pricing policies and interstate cooperation (paras 10.45 through 10.50). However, it is my view that its recommendations on water-pricing, increased powers for the River Murray Commission, and increased funding by the Commonwealth Government do not go far enough in tackling the problems of the Murray-Darling Basin. This is another case where coercion at the Commonwealth level is warranted in order to improve national welfare. The Commonwealth Attorney General may see this as his next major environmental challenge following his success in the Franklin River dispute.

### *Weeds, Pests and Diseases*

The Group believed that integrated pest control using chemicals has more to offer than biological control of pests. They saw biological controls as being more costly to develop and, perhaps surprisingly, involving more serious conflicts through undesirable external effects. Whatever the reasons, it does appear that biological controls have not lived up to their early promise.

The environmental dangers of chemical controls occupied most of the Group's attention in their section on 'other environmental issues from agricultural sources'. The Group advocated increased roles for Departments of Agriculture in education programs and administration of regulations concerning the use of agricultural chemicals. However, as in the case of soil conservation programs, there are arguments for allocating the extension and regulatory roles to separate institutions. The Group should also have considered taxes on chemicals as a means of reducing the use of those having undesirable environmental effects.

In my view we are probably under-investing in the economic evaluation of pest management programs. Plant pests and diseases are estimated to cause pre-harvest losses of up to 40 per cent of the value of crop production in the U.S.A. and at least 20 per cent in Australia (Johnson and Girdlestone 1983). Relatively little seems to be known about the economic losses caused by animal pests and diseases, or the most efficient means for their control. The externalities involved in the control of many pests means that their evaluation and control should not be left entirely to the private sector.

### *Quarantine*

Quarantine is one area where governments have long intervened in the control of pests and diseases. The Group saw the cost of quarantine services, the importation of animal and plant genetic resources and the importation of live viruses as the major issues relating to agricultural quarantine in the 1980s (para. 10.92).

Quarantine is yet another area where the Group assumed the costs should be met from public funds. They regard current levels of expenditure as reasonable and suggest the levels (para. 10.94) '. . . will always involve a compromise between economic and technical considerations'. However, despite geographic isolation and quarantine, the high incidence of exotic pests and diseases (Harris et al. 1974, para. 5.200) pointed to the existence of potential trade-offs between levels of quarantine expenditure and pest control. Again, it seems that very little is known about the magnitude of these trade-offs.

The Group devoted considerable attention to the issue of importation of live viruses and the establishment of the Australian National Animal Health Laboratory (ANAHL). Veterinary scientists and others have apparently been able to persuade governments to outlay $145m in capital costs plus $8m per annum operating costs on the ANAHL (para. 10.99) in the absence of a thorough evaluation of the likely benefits. The sums involved are substantial in comparison with the $27.1m spent on quarantine in 1980-81 (para. 10.94) and strengthen the argument for additional research into the economics of pest and disease control.

### *Land-Use*

The Group's section on land-use should probably have been cross-referenced with the sections on soil conservation and water resources. All three areas were concerned with conflicts between productive and consumptive use of environmental services and their joint consideration would probably improve prospects for the development of comprehensive and consistent policies.

The Group identified three agricultural land-use issues of importance to policy makers in the 1980s: the preservation of 'prime' agricultural land; restrictions on the way in which farmers may use their land; and foreign ownership. The Group returned to its general philosophy in stating that (para. 10.66) '. . . market forces should be the major influences in determining the use of land'.

I have few complaints about this section. The Group could have considered the implications of aboriginal land rights issues for agricultural industries. It could also have added animal welfare to its list of responsibilities for hobby farmers (para. 10.68). However, the main difficulty for policy makers in the land-use area will lie in convincing people that market forces should be mostly relied on to allocate land between competing uses. The agricultural economics profession has a responsibility to continue to contribute independent views to what will often become emotion-charged debates about foreign ownership, preservation of agricultural land and the property rights of landholders.

### *Animal Welfare*

The Group presented a terse but well-balanced summary of community concerns on animal welfare issues. They pointed to the trade-offs between animal welfare and higher food prices but, like many people, probably over-estimated the impact that welfare controls (or pollution controls for that matter) will have on prices. In the medium term, technological change in animal management systems should reduce the initial price effects of such controls.

The Group supported the development of codes of practice for animal welfare but suggested that they be voluntary. Voluntary systems are not likely to succeed in meeting community standards for sustained periods of time and we can expect to see them becoming mandatory.

### *Concluding Comments*

The chapter on agricultural resource management should have included a section on human nutrition. There were very few submissions to the Group on this subject but it is an area that will assume increasing importance in agricultural policy issues. The externalities involved in human nutrition are probably more imagined than real but the belief in their existence has lead to a spate of new regulations which affect producers and consumers alike. For those who imagine it to be a dry subject, I recommend Cosman's (1983) article (and the clear chicken soup p. 4).

Despite a subdued national economy, resource and environmental issues are very much alive in Australia. In addition to the Balderstone Report, the reports of more recent national (e.g. Department of Home Affairs and Environment 1983) and state (e.g. Victorian Ministry for

Conservation 1983) inquiries contain important implications for the likely future directions of agricultural policy.

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