Australia's National Soil Conservation Strategy: Land Use Planning vs Free Markets

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Bruce Davidson, *formerly Senior Lecturer in Agricultural Economics at the University of Sydney,* *argues that present policies to combat land degradation are based on questionable assumptions and that the problem is for the most part being solved privately by individual farmers.*

IN October 1987 the Australian Soil Conservation Council of the Department of Primary Industry and Energy published a Draft National Soil Conservation Strategy. This was to form the basis of the policy to be adopted by both government and non-government bodies as a means of controlling and preventing land degradation (Australia, Department of Primary Industry, 1987).

The strategy is based on the assumptions that Australia's agricultural soils are a finite resource that is basic to its production of food and fibre, and that these soils have been degraded by inappropriate methods of management. It considers that further degradation can be controlled only by land planning involving government agencies, land users and the community. The supply of agricultural land is thought to be threatened also by competition from alternative uses, including recreation, housing, mining and other forms of industrial development; the effect of such losses should be minimised by land planners assessing the capability of land for different purposes, so that the diversion of good agricultural land will be minimised.

Although the strategy has been adopted by a number of government authorities concerned with land use and by some conservation organisations, both its assumptions and the methods it recommends to control land degradation are open to question.

The Supply of Agricultural Land

Agricultural land can be defined as land capable of producing plant and animal products for human use. Since it can be created, it is not a finite resource. Some of the world's most productive land, such as the polders of the Netherlands, were reclaimed from the sea. The fertile wheat lands of East Anglia and the plains of Flanders are reclaimed swamps that had no agricultural value before they were drained. Similarly, deserts can be converted to agricultural land by means of irrigation.

Degraded land can be restored to its original fertility. Soil structure can be restored by adding organic matter, and chemical fertility by the use of artificial fertilisers. Acidity can be reduced by the use of lime, and in some cases salinity can be reduced by leaching and drainage. Even badly eroded land where all the top soil has been lost (as in the Welsh hills) can still be used for cropping if it is fertilised and organic matter is added.

The supply of agricultural land, like that of other natural resources, changes with technology. Much of the agricultural land available today would not have been available before the advent of chemical fertilisers. The trace element-deficient soils of Australia are a typical example. The development of plants with short growing seasons increases the area of agricultural land available for human use, as does the immunisation of animals against certain diseases.

In the past century the world's supply of agricultural land, like that of most other natural resources, appears to have increased at a greater rate than the demand for it. This is reflected in the decline in the real price of agricultural land and agricultural commodities in terms of the prices of both capital and labour (Barnett & Morse, 1963: chs 3, 5, 6, 11, 12; Simon & Kahn, 1984:1-47).

The fertility of agricultural land, and hence its supply, in those regions of Australia with a growing season of over five months, which produce 90 per cent of Australia's agricultural commodities, is much higher today than when European settlement first occurred. Between 1820 and 1860 most of Australia's agricultural land in this region was used to produce wool by grazing one sheep to three acres. The improved soil moisture supply following ring-barking, which began on a large scale in the 1860s, increased the carrying capacity to a sheep per acre. Land

clearing, the development of new types of machinery and the construction of railways in the 1870s and 1880s, together with the use of superphosphate and the breeding of new varieties, made it profitable to produce wheat for export in much of the region. The introduction of subterranean clover and barrel medic, top-dressed with superphosphate and trace elements, increased the carrying capacity from one to three sheep per acre. The use of the same plants in rotation with wheat after 1940 increased the levels of soil nitrogen and organic matter and so eliminated the need for bare fallowing in Southern Australia. This in turn reduced wind and water erosion on cropped land, which was further reduced by the effective control of rabbits with myxomatosis and better poisoning methods in the 1950s. The dust storms of Melbourne and the pink snows of the Victorian Alps, which had been common in the 1930s, no longer occurred. It was not until the drought of 1982-83, when the wheat crop was not sown and the land remained worked during the summer as if it had been bare fallowed, that these recurred. The discovery that several million acres of land were deficient in molybdenum, copper, zinc or cobalt and other trace elements in the 1950s made a significant contribution to Australia's supply of agricultural land.

It was this increase in soil fertility and better control of erosion that enabled Australian farmers to

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double the nation's agricultural output (measured in constant money terms) between 1950 and 1985. The increase was more than sufficient to offset any decrease caused by the loss of production due to the degradation of limited areas during the same period.

Transferring Land to Competing Uses

The amount of agricultural land available per capita in Australia is at least three times greater than in the US and nine times greater than in Europe (Davidson, 1969:48-92). This is reflected in the lower price of agricultural land of similar quality in Australia than in Europe and the US. In these circumstances, transfers of land from agriculture are less important than in other countries. In many instances the transfer is highly desirable. There is no shortage of food in Australia, but there is an acute shortage of housing and this is partly due to the delay in transferring land from agriculture to housing.

Similarly, the subdivision of commercial farms into units that are too small to provide an adequate income for a family is prohibited in some States. If such holdings are used for recreational purposes as hobby farms, and the owners' obtained their income from some other source, the income from agricultural activities is irrelevant. The higher prices paid for such farms than the surrounding agricultural land is a reflection of society's demand for more land for recreation. Subdivision into hobby farms can assist small uneconomic commercial farmers to leave agriculture or to relocate to larger holdings. Small farmers with inadequate incomes are more likely to subdivide their holdings and sell them to hobby farmers than are larger farmers with adequate incomes.

In a country such as Australia where surplus agricultural production is a continuing problem, transfers of land to more productive uses, such as housing or recreation, should not be regarded as a form of land degradation.

Community Support

If community support is ill-informed, it can be extremely detrimental. Irrigation projects in Australia were widely supported by the community because it was believed that since Australia had a lower average rainfall than other developed countries, well-watered land was the nation's most limiting factor. As the per capita supply of well-watered land was higher than in other countries the schemes were not viable economically.

The construction of such works continued long after it was known they were detrimental to the economy because the community's mistaken beliefs made them politically attractive. In the long term they proved to be one of the major causes of land degradation.

The Free Market vs Land Planning

If land is held under a form of tenure in which it can be transferred in a free market from one owner to another, and if all benefits and costs arising from its use accrue to the first owner, the optimum use should be achieved without external interference. The free market could fail to achieve optimum use of resources because of a lack of knowledge by the owner of the consequences of his or her actions or of the true cost of resources and products. However, a planning authority would achieve better results in such a situation only if it were better informed than a private owner.

A far more likely cause of sub-optimal use in the

free market occurs where the landowner fails to capture all the benefits he or she creates from land use, or fails to meet all the costs associated with utilising the land. Externalities of this nature can be dealt with either by regulation or by charging the landowner for any external damage caused and by rewarding the owner for all benefits created but not received (Chisholm, 1987).

A satisfactory system of regulation, charges and rewards can be developed only if there is sufficient knowledge of the cause of the external damage or benefit and of the net losses or gains to both the owner of the land and the rest of society in controlling it. Without such knowledge the regulating or taxing and rewarding authorities could cause a greater net loss to society than the original externality that they set out to prevent.

There is no evidence that farmers have, or would, willingly use the land in such a way as to destroy its productivity. The farmer's land is his main, and normally his only, asset. Any form of degradation would lead to a decrease in its value, which farmers protect as carefully as suburban home owners guard the value of their houses.

Land Use Planning

The vast increase in the productivity in Australian soils during the last 100 years occurred under free market conditions where the individual landowner-farmer decided how the land should be utilised.

On the other hand, land planning by government organisations has not been particularly successful in Australia in the past. Spectacular failures include that of state farming by Governor Phillip and his attempt to settle ex-convicts on small holdings. Government planners also attempted to prevent the growth of Australia's first large agricultural industry, wool production, by limiting squatters to an area within 150 miles of Sydney. In 1860, when land was granted to the large numbers of immigrants who had arrived during the gold rushes, farms of 640 acres or fewer were the basis of settlement and these areas were insufficient to support a family with the technology then available. It was only when new cultivating and harvesting machinery had been developed (largely by farmers), and new wheat varieties bred by William Farrer, that wheat could be profitably produced on such farms. Profitable production of butter, mutton and beef was possible only after 1880 when refrigeration enabled butter and meat to be exported. The net returns from the irrigation works that were first established in the 1880s were never great enough to pay for the reservoirs and distributory works constructed by the state. Attempts at state cooperative farm settlements and closer settlement in the 1890s and of ex-servicemen after World War I were all failures. No state project was more thoroughly planned than the Ord River scheme, but it was an economic failure.

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Land degradation has been caused mainly by a lack of knowledge of how to deal with a problem when it arises. Examples are the European rabbit and the infestation of large areas by the prickly pear. In both cases neither the state nor the farmers had a solution for many years. Other major problems arose because incorrect farming methods were recommended by state advisory services; one example is long fallowing, which led to soil erosion in the wheat belt. Ill-conceived state irrigation projects led to salination and high water tables; and land clearing, the major cause of dry land salinity, was insisted upon by state land settlement authorities.

Probably the only instance where land planning is required to prevent land degradation is where the results of a farming practice are detrimental to the land of other farmers or to the environment off the farm. Any form of restriction in land use should be limited to dealing with externalities of this type. In doing so it is essential to measure both the costs and benefits of any planning measure. The prohibition of a farming practice in a particular area to reduce harmful land externalities may lead to a greater reduction in net return than the external damage caused by it.

The recent prohibition of further land clearing in Victoria and South Australia and the widely-acclaimed plan to plant large numbers of trees in order to reduce dry-land salinity, without any assessment of the costs and benefits of both schemes, are excellent examples of how control and land planning should not be used (Brett, 1990). Similarly, the Australian Conservation Foundation and the National Farmers' Federation have produced a plan detailing how $340 million should be spent in reducing land degradation,

but without attempting to quantify the value of the corresponding benefits (Australian Conservation Foundation & the National Farmers' Federation, 1989)

Conclusion

The major cause of land degradation in Australia is a lack of knowledge of how to prevent the problem. Australian farmers have demonstrated that they rapidly adopt techniques that increase soil fertility and, provided farmers are supplied with a profitable method of restoring degraded soil to its former productivity, they will adopt it. The available literature suggests that there are few profitable methods of preventing the problem that are not being practised by farmers (Chisholm & Dumsday, 1987). In these circumstances research must be the first, and possibly for a time the only, strategy.

The limited losses of agricultural land that have occurred in Australia have been more than offset by the increasing fertility of other land. There is no evidence that state planning would be a more effective means of preventing land degradation than the decisions of individual farmers in a free market, and there is a good deal of evidence that state planning in the past has been a major cause of degradation. The most surprising feature of the National Strategy is that the use of agricultural land should be regulated when a great deal of effort is being made to deregulate the use of resources in other sectors of the economy to increase the efficiency of resource usage.

It is probable that land planning should be limited to dealing with externalities and even this will be possible only when much more is known of the nature of the externalities and the costs and benefits associated with controlling them.

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