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AGRICULTURAL POLICY REFORM AND PUBLIC GOODS

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Introduction and overview

This paper discusses the relationship between agricultural policies, the incomes of farmers and the supply of public goods. It falls into seven sections:

I. Concepts and main themes
II. The range of public goods in agriculture
III. The market for public goods
IV. Measuring public goods and costs
V. Policy instruments
VI. The implications of proposed changes in agricultural policies
VII. Income support and the provision of public goods

I. Concepts and main themes

"Public goods" are those which cannot be withheld from one individual without withholding them from all. They include benefits such as street lighting, the eradication of malaria or smallpox in a region or flood prevention works. Agriculture "produces" several such public goods and can also be responsible for some "public bads". Benefits include, for example, valued landscapes, access to the countryside for visitors and ramblers, architecturally attractive farm buildings and habitats for wild plants and animals. In some situations there may be debit items such as, unpleasant smells, obstruction to traditional footpaths or losses of natural habitats. Many of these public goods and bads are "externalities" (1) they arise "incidentally" in the process of farming and do not figure in the profit and loss account of the farmer. Nevertheless they represent real losses or benefits to society as a whole. The concept of "public goods" may also incorporate social benefits and costs which arise through the impact of the decisions of firms on the viability of communities, the survival of traditional cultures and the employment of people not directly paid by the firm concerned. When changes occur in farming methods, whether these arise from market, policy or technical developments, such externalities are likely to change. Because there exist no "property rights" in the provision of public goods, whether these stem from externalities or from other sources, there is not market based incentive to continue the production of "goods" or limit the production of "bads".

The economic importance of agricultural activity has generally been assessed in terms of its contribution to food supply. Values of output are determined by the price people pay for food, the cost of resources measured by farmers’ expenses on inputs. Such a valuation, even where not distorted by "market" or "political" imperfections, is incomplete. Agriculture contributes
to the supply of public goods. If the resources applied to food production are reduced the availability of some "public goods" will change. Such changes may have positive or negative values but they need to be considered when policies are being altered.

Recent developments in OECD agriculture have enhanced the relative importance of public goods. Because food production has increased faster than consumption in OECD countries, the value of marginal increases in food production on world markets is very small and may even be negative. Production inevitably affects the environment. Increasingly the impact of some modern farming techniques, the use of chemicals such as pesticides and fertilizer and the drainage of wet lands is perceived as having a very high environmental cost. Second, modern farming requires fewer workers on the land. The reduction of the farm labour force, as a consequence of technological developments, can damage rural communities. Not only may there be fewer farmers and farm workers but also less employment for those who provide services for the rural population. Both changes in the physical environment and the decline of rural communities affect not only the current population but also future generations.

Awareness of the importance of rural public goods does not stem exclusively from changes within agriculture. Modern economies make heavy demands on the environment and may result in irreversible and adverse changes in the natural resource base. All industries including agriculture are involved in issues such as global warming. Rising affluence in the richer parts of the world has increased the opportunities which people have to enjoy the countryside as a place for recreation, residence and leisure. This represents an extra demand on rural resources competing with traditional requirements for both "marketable" and "public" goods.

Markets do not measure directly the value of public goods but changes in agricultural markets imply that there will be a change in their supply. Policy makers, therefore, may in future have to make explicit provision to promote benefits and restrain costs which hitherto have been accepted as part of the "by-products" of food production. To do so it is necessary that such public goods should be identified and given an appropriate weight. In principle, once this is achieved the task of policy makers will be to provide the appropriate incentives or penalties to ensure that farmers, and others who control agricultural resources, use them in a way which reflects both their market value and their public good costs and benefits. The goal is to make the choices facing farmers, and others, reflect the full social costs and benefits involved. If this could be done the resulting distribution of resources would represent the highest attainable level of real income for society given its available resources and technology.

In practice, there exists no agreed method by which we may assess or measure such public goods nor do we know adequately how to design policies which give just the right incentives to farmers to encourage an appropriate level of provision. Government intervention which tries to cope with perceived public goods, may distort the allocation of resources in ways which make society poorer in both market and public good values.

This can be particularly important in an international context. Benefits secured, or costs forgone, in one country may imply bigger losses
elsewhere in the world. Agricultural legislation which is claimed to safeguard a public good within one country may involve a new non-tariff barrier which distorts world markets. "Public good" costs may be forced on other countries. For example, acid rain or nuclear fall-out readily crosses frontiers. Markets may also translocate environmentally damaging activities from one part of the world to another. For example where a public good argument is used to justify cuts in production in developed countries it may become profitable to intensify production in poorer countries in order both to feed their own population and to generate exports. In effect the relative competitiveness of countries will be affected by their decision to account for, or to neglect, public goods in setting prices. The explicit recognition of the importance of public goods is thus a proper issue for international debate and agreement. In some areas, such for example as the use of the oceans or global warming, effective action may depend entirely on international co-operation. Without it the best intents of even large countries may yield no worthwhile result. It is not satisfactory to achieve "market-oriented international trade" for goods and services if the gains are undermined by reduced real benefits when the totality of costs and returns, including those relating to public goods are taken into account (2).

Even if correctly conceived, policies involve costs. Some costs stem from the need to administer arrangements which may be complex and regionally dispersed. Some fall on other countries who find their exports reduced or their imports made more expensive. Such policies redistribute income within the countries which implement them. Part of this redistribution may be via the budget, where "public good" policies will have to compete with other calls on public expenditure. Part of it is likely to be less visible. For example, where farmers or other members of the rural community may have to accept reduced opportunities to earn higher incomes because of restrictions on new technology.

Agricultural policies have always had multiple objectives. One of their most important has been to provide a more satisfactory flow of incomes to people engaged in farming than would result in the absence of government intervention. For a variety of reasons such policies have had at best limited success. Most of the income transferred has tended to go to the larger farmers. Much of the benefit has been capitalised in land costs, making the lot of the new entrant even more difficult. Attempts to target support to specific groups or designated regions have sometimes had the effect of impeding the economic development of those it was intended to benefit. Recipients only benefit as long as they continue to farm despite the underlying need to find some other income source. The recognition of rural public goods as a benefit for which society may now have to make explicit payments, creates new options for income flows which might meet the needs of such small, remote farmers, whilst encouraging them to use their resources in directions which correspond with the real economic interest of society. This will increase the complexity of policies and need specific instruments to target payments satisfactorily. Payments made under such policies are not "hand-outs" based on the need of the recipient but revenues for services provided. Society wants these outputs and has to find an effective method of rewarding those who produce them.

Not all farmers who are in need may be able to provide such services. In the long term structural adjustment is required to ensure that such farmers or their successors have improved income earning opportunities. In the
meantime, minimum income support may represent the only way to prevent such farmers suffering hardship.

II The range and determinants of public goods in agriculture

Changes taking place in farming affect a wide range of differing public goods. Their impact may be positive or negative. The public goods to be considered include, for example:

Positive public goods

-- the sustainability of the farming system;
-- the maintenance of traditional landscapes;
-- wildlife habitats -- for both plants and animals;
-- the contribution which farming makes to sharing the overhead cost of providing a rural infrastructure of roads, houses and social facilities;
-- the sustaining of rural communities and cultures:

Negative public goods

-- the decline of communities as the demand for labour in farming falls;
-- the exhaustion of non-renewable resources of phosphate and potash which will reduce the potential productivity of farming in the future;
-- the loss of biodiversity as a result of the use of a limited range of profitable plants and animals;
-- the pollution of water courses, ground water and the air as a result of the use of fertilizers, pesticides or the burning of straw;
-- soil erosion or degradation as a result of unsustainable farming methods;
-- the clearance of forest with implications for the release of CO2, the major greenhouse gas, into the atmosphere
-- congestion caused by slow moving farm vehicles or the driving of herds of animals along public roads.

A list of this type cannot cover the wide range of public goods which are valued by people in the various countries of the world. Important problems thus arise in relation to the interpersonal valuation of public goods.
Different circumstances give rise to different valuations of particular types of public good. Such values are real and it would be oppressive to impose other evaluations on those affected. As the list above suggests, some of these public goods are enjoyed -- or suffered by citizens of other countries than those who create them. This raises important questions about how those who wish to secure some public good, generated in another country, can do so in the absence of a market for the product concerned. For example, people in rich countries who wish to preserve the tropical rainforest may need to find some means of compensating resident farmers who believe that by clearing the land for food production they will raise their own incomes. A similar and even more intractable problem stems from the fact that some public goods benefit future rather than present generations. Such people have no vote or voice, although their welfare may concern many members of the current generation. The fact that many public goods are "delivered" over an extended time period raises difficult questions in relation to risk and uncertainty. For example, it might be unjustified to reduce the rate of economic growth now in order to save energy, if new technology were to make energy very cheap for future generations.

These considerations suggest that there is likely to be a plurality of valuations about the same specific public good. Some of the attempts made to measure such values are discussed below. However, at this stage it is worth noting some of the more general criteria which appear to influence public attitudes to the use of rural resources. These include:

-- The extent to which the population is assured about the supply of food: if this is in doubt then, despite their relevance to agricultural production in the long term, many environmental issues may seem of less importance.

-- The resource endowment of the country concerned, the density of population, the availability of capital and the type and quality of land. Countries, such as the Netherlands, where population densities are very high must take a different view of the importance of land for recreation and amenity than more sparsely populated areas such as the prairie provinces of Canada. Countries with large desert areas or very short growing seasons may need to be more protective of their better land than those more richly endowed.

-- The intensity of farming: farming methods which result on heavy applications of fertilizer or use intensive systems of livestock production have a different impact on the environment than traditional agriculture. Farming systems which result in the eutrophication of water courses or use methods which appear inconsistent with animal welfare impose a public good cost.

-- The pattern of land ownership and use: where land has been regarded as a factor of production and has been allowed to change hands at whatever price it can realise in order to achieve lower production costs, the reduction in the number of people in the industry and the enlargement of farms may cause no concern. In contrast, where farms have been handed down within families as a "trust" held by one generation for its successor, the impact of the same sort of changes is seen to be extremely negative. In much of Europe and Japan, for
example, policy makers have proclaimed their determination to preserve the "family farm". In some countries there may be legal or quasi legal obstacles as well as taxation and inheritance arrangements which affect farm enlargement or amalgamation.

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**The level of economic development:** Where economic growth creates new jobs and higher expectations among younger people the process of "releasing labour from farming" may be welcomed. Where economies stagnate, "forcing people off the land" may be seen as a public disbenefit, adding to the problems of urban as well as rural regions. In higher income countries greater opportunities for leisure will add to the public good values of landscape, a diverse habitat for wildlife and access for visitors.

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**The degree of knowledge and awareness:** Where education facilitates job mobility and research provides a continuing flow of new ideas relevant to the improvement of industry, there is generally a greater willingness to adapt to new industrial opportunities. There may also be greater awareness of the need for vigilance in order to ensure that innovations do not have unforeseen damaging consequences. Much of the contemporary concern about the environmental impact of farming originates in the more developed and educated regions of the world.

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### III The "market" for public goods

In a strict sense there can be no market for public goods in which individuals exercise their choices by spending their money. They have been enjoyed or suffered as "by-products" of farming. There is, however, a political "market" where the value of these by-products has been one of the arguments for public spending on agriculture. Much of the desire to protect agriculture in Europe and Japan has stemmed from a belief that the benefits society as a whole enjoys from keeping established systems of land use and ownership intact justifies the types and degrees of intervention their governments provide.

Today the situation is radically different. Environmental interests claim that farming, as it is now practised, far from protecting the environment is destroying it. The use of agricultural chemicals, the drainage of wet areas of farm land and the spread of intensive systems of livestock production, with their consequences in terms of the disposal of effluent, have led to the elimination of many traditional species. Much of this loss results from the disappearance of traditional agricultural habitats. Some of it is the consequence of poisoning wild plants and animals. In some instance the escape of nitrogen into water courses has led to eutrophication, creating lifeless streams where once fish, birds and plants thrived. Although critics often focus on large farms as the cause of these problems, there is no evidence to suggest that small farms are any less likely to cause environmental damage. Indeed, the need to create a bigger business on a small areas may press small scale farmers into even more intensive methods.
The political "market" has changed for food production as well. In May 1987 the OECD Ministers agreed that a concerted reform of agricultural policies must be implemented in a balanced manner. This would be based on the principle that "The long-term objective is to allow market signals to influence by way of a progressive and concerted reduction of agricultural support, as well as by all other appropriate means, the orientation of agricultural production; this will bring about a better allocation of resources which will benefit consumers and the economy in general." (3) The implications of the Uruguay round are also relevant (4). The outcome is as yet unknown but it seems likely that farmers will have to cope with reduced levels of assistance and protection for most food products.

The traditional argument that a "healthy" agriculture would ensure a good environment, implies that a reduction in support would reduce the supply of farm goods and thus have a negative impact on the supply of public goods in those countries which most generously support their agricultural sectors. In fact the impact of a reduction of farm support on environmental public goods is not clear. As assistance to farmers is reduced some may be under even stronger pressure in the short-run to intensify in order to achieve the lowest possible costs in producing saleable food. In contrast others may choose to seek additional income outside farming allowing the farm business to become much less intensive. Some land may even be allowed to go derelict -- a situation which at least some ecologists would regard as an improvement (5). In each case there will be a change in the supply of public goods.

If public goods can no longer be secured as by-products of food production society may have to face the need to pay for them explicitly and through the public purse or to pursue them by regulation. Owners of resources who provide these goods must receive an income sufficient to retain them in appropriate uses. Payments, although they have not figured in the past receipts of farmers may now have to be made for the production of some public goods. In effect an explicit, if political, market for public goods will have to exist if these are to continue to be supplied. Even in the absence of changes on the supply side such a market may now be needed because of developments relating to demand. By disentangling the environmental goals from the process of food production the opportunity is created to supply public goods, as well as food, at least real cost. Even where regulations are used the farmer must still receive a sufficient return if the public good is to continue to be available. Highly visible public expenditure costs may, however, not appear to be the the least cost way of ensuring the desired supply of public goods. There will then be a need for considerable public education if the supply of both market and public goods is to be optimised.

The demand for public goods is often expressed by voluntary agencies, such as, for example, Greenpeace. It may also be demonstrated where, for example, those downstream of a source of pollution, decide to pay a polluter to take remedial action. Where the consequences of pollution are felt outside the remit of the government of the territory within which the polluter is situated, the "victim pays" may be the only practicable approach. In most cases, if action is to be taken the need has to be expressed through the political process. Governments, once persuaded that some particular benefit or cost needs to be considered have both positive and negative policy tools at their disposal. They may identify some land use or rural facility which they wish to foster but for which their exists no, or an inadequate, market demand. They
can offer payments to the farmer to use his land in this way. One recent model of this type is the designation of Environmentally Sensitive Areas in the UK. Here, farmers, in return for managing their land in an approved manner receive payments to compensate them for the loss in income which results from not being able to employ technologies which produce more food. Payments have to be sufficient to encourage farmers to work in this way. If the returns from commercial food production fall this may help to bring about a shift towards the production of public goods by reducing the inducements needed.

A contrasting approach is to identify some particular feature of farming activity as creating a public good "disbenefit" or cost. Essentially this labels the process as polluting and makes possible the application of the principle, "the polluter pays". Such an approach can also relate decisions about commercial markets to public goods markets. If the profits from carrying on the polluting activity exceed the cost of paying a "fine" based on the costs of removing the consequences of pollution, the process will continue. In circumstances in which there is no means to remove the pollution the choice may be between prohibition, which effectively values the "public good" as infinite, or paying the polluter to discontinue his activity. In this case the market is between the "victim" represented by the public sector or other affected groups and the polluter who is assumed to have a price at which the compensation offered will exceed his estimation of the advantages he derives from the continuation of the offending activity.

Prohibition may generate a "black market". The costs of enforcement are often substantial. If as the trade in drugs demonstrates, the reward is high enough, some entrepreneurs will be willing to break the law. In such clashes between private values and public goods the shape of the demand curve for the private goods is critical, if this should be highly inelastic, then neither taxes nor prohibition nor fines are unlikely to work very effectively. For those who seek environmental goods this emphasizes the importance of continued abundance in the food market. If a food shortage developed the imperatives of the private food market would make the retention of public goods which conflicted with greater food production extremely difficult.

So far we have accepted the notion that the political process can give rise to an appropriate demand for public goods. This avoids one of the most difficult issues. Knowledge in the public goods market is far from perfect. Governments derive some indications of public good values from their own monitoring processes relating, for example, to public health, to land use, to water quality and the population of rural areas. The public debate is strongly influenced by the skills of pressure groups who have particular public good concerns. In the United Kingdom, for example, there are powerful lobbies for animal welfare, for birds, for ramblers and for countryside preservation. Such pressure groups do not have common interests and one difficult task for the policy maker is to weight appropriately the significance to attach to each. Even more difficult are the interests of those who have no pressure group but who may be affected by decisions to buy a particular package of public goods. For example, a de-intensification of farming methods will not only affect farm incomes, it will also reduce incomes in rural transport, rural education and rural shops. Even more at risk are those for whom the effect of any specific public good decision may be very small, so that they do not protest, but for whom the combined effect of several such decisions may seriously damage the competitiveness of their industry, reduce the number of jobs in other sectors.
of the economy or slow the rate of economic growth. Governments, and
ternational agencies have a responsibility to take a holistic view of such
matters but the techniques to do so are very inadequate and the pressure from
articulate pressure groups difficult to resist.

The market in public goods has some of the characteristics of any other
market. Like private goods markets, if there is a shortage pressures will
emerge to increase production. As with conventional markets, at the point when
the decision to expand the supply is taken, it will not be known how large the
market is. One crucial difference is, however, that in the private market the
user of the good has to pay the cost of its production or supplies will cease.
In the public goods market the price to the user is effectively free.
Shortages will then appear to exist until the market is saturated at a zero
price. Since the supply of public goods to this market involves positive
costs, this means that unless the government is prepared to live with a
situation in which it is continually being accused of deliberate undersupply,
on the basis of usage and manifestations of public interest,) too many
resources will be committed in this direction. Rising budget costs are one way
in which some sense of priorities may be introduced to this debate but not all
"public goods" policies involve separately identifiable budget costs and some
push the actual cost of providing the "good" onto other private accounts. For
example, bans on the use of growth hormones in meat give rise to very little
identifiable public expenditure, they do, however, reduce consumer choice and
impair the ability of the farmers affected to compete in world markets. This
difference between the working of private goods markets and public goods
markets it especially important when no agreed system of measuring such public
benefits exists.

Like other markets the provision of public goods confers benefits and
imposes costs on particular individuals. Some of the recipients of benefit may
be easily identified. Where a footpath has been opened up those who gain are
those who walk. Even here, there may be some benefit to non-walkers who find
the places in which they operate less congested because of the absence of the
walkers. Greater difficulty exists where public goods are of a more diffuse
character. For example, the expenditure of public money to safeguard a
traditional landscape may be regarded as a public good. Who receives this?
Those who travel to the region specifically to see it clearly do. Those for
whom the landscape is a backcloth to some commercial activity, such as a tourist
business may benefit, if more people visit the area. Those who travel through
the area simply to get to somewhere else will probably evaluate it in terms of
the shortness of the time they have to spend in sight of the improved
landscape, but this no more means they dislike it than that they benefit from
it. Farmers, who might be thought, as continuing residents to gain most may
have very ambivalent views. The attraction of more tourists is not universally
welcomed. In the light of some of the discussion which follows in this paper
this question of the distribution of benefits cannot be safely ignored.
It raises in an acute form the issue of identifying and measuring costs and
benefits among very different groups of people.
A considerable amount of work has been done, especially in the United States, on the measurement of externalities, many of which fit into the character of the public goods which are the theme of this paper. A number of approaches have been tried. None of them are without difficulty.

One route is to evaluate how much people are prepared to pay to travel to see a particular site. The implication is that the further they are prepared to travel the more they value the objects seen at that site. There are some obvious problems. For some people the process of travel is itself a "good", if they enjoy driving they may prefer distant to local sites as giving them more opportunity to indulge this taste. For others travel may be burdensome and the shorter the time spent in the process the more they will enjoy their lives. Again, people may visit a particular location not to see that site but because it is on a journey to some other more distant target. If they stop in the area it could well be because it has amenities for eating and sleeping rather than anything to do with the landscape itself. Evidence of this type is inevitably set in the context of a particular time and place, there is no reason to suppose that public evaluation of such sites will not change. Indeed the evidence from the tourist business is that particular places enjoy periods of being "fashionable" and "unfashionable". Where, as may often be the case with public good investments, the changes intended are likely to last for many years, such ephemeral evidence may be of little interest.

Another technique is to seek to determine how much compensation, positive or negative, people would need in order to enjoy the same level of utility as existed before a planned change in their environment took place. This "contingent" method has the merit of incorporating both those who gain and those who lose in a single measurement system. There are however, some severe problems. First, it is difficult to be sure that people respond to a hypothetical question in the same way that they would to an actual situation. Second, this approach almost certainly over-simplifies the circumstances which would face a consumer if the public good were to be offered to him. Third, in order to express a view the consumer has to have information about what is actually proposed. The way in which such information is provided may influence the level of compensation required. Fourth, the full range of considerations which may condition a particular consumers evaluation will not be known to the questioner so that it may be impossible to "ask the right questions". Attempts to use this approach are time consuming and costly. They may even seem, to those affected, impertinent. Methods of this sort may most readily be used where a clearly defined change in the supply of public goods affects a readily specified group of people. They are much less easy to apply when the effects of a change are very widely disseminated. Many agricultural public goods are of this character. They impose considerable costs on a small part of the community who provide them. They may lead to small gains or costs for millions of people who receive them. These might, if there were a suitable system of aggregation, be judged to outweigh even large individual benefits or losses associated with their provision. In principle, in such a situation, compensation should be paid so as to place losers in no worse a situation than before the change took effect. In practice such compensation is very difficult to calculate and where the shifts in benefit or cost to the individual are small the costs of administration may well rule it out. Hard questions about
fairness and equity thus remain unresolved even when such contingency valuations are made.

An approach which may be especially applicable in the agricultural sector is to examine changes in land values as indicating the extent to which some environmental feature is preferred. In principle, if a particular environmental change is regarded as an improvement, people will be willing to pay more to enjoy it. Such additional values may affect not only the land itself but also other sites from which the "improved" land can be seen. A major problem with this approach is its implicit "ceteris paribus" assumption. Land values reflect a multitude of considerations including the environmental amenity of the land. People may be willing to pay more for a piece of land because of a change in planning legislation which makes it possible to change it from agricultural to residential use. The price paid will reflect changes in the local economy which may have nothing to do with the environmental question which is being explored. Because these other values are changing, in ways which cannot be independently measured the attribution of any change in land values to specific environmental "improvements" is likely to mislead.

A feature common to all attempts to evaluate public goods is the extent to which their recognition is related to the state of education of the population. An example helps to highlight the issue. In the absence of knowledge about the value of bio-diversity, agricultural practices which eliminate insects which bite humans, weeds which reduce yields and areas of scrub land may all be regarded as environmentally beneficial. Given more understanding of the importance of bio-diversity all these practices may, on the contrary, be regarded as environmentally degrading. A given system which uses these agricultural practices may be said to lose utility because of an improvement in the level of education. In a private goods market such a change would be made effective by an autonomous reduction in demand for the product. Changes in tobacco consumption following evidence of the link between smoking and cancer, provide an example. In the market for public goods adjustments are unlikely to be as smooth. Given continuing improvements in knowledge there should be a progressive adjustment of policies, including from time to time reversals in their direction. In practice the response to greater understanding is likely to encounter severe political obstacles. Any existing array of policies creates a set of clients who depend upon their continuation. Agricultural policies in all developed countries provide examples of this situation. New policies are likely to be politically acceptable only when they acquire sufficient momentum in terms of public opinion to overcome these entrenched interests. This makes frequent changes in direction improbable even when knowledge itself is progressing rapidly. The political risks discourage any alteration in existing procedures until the case for change becomes overwhelming. Thus the process of incorporating public good dimensions into policy thinking is likely to be erratic, sometimes even self-contradictory and generally to lag behind the understanding of those who are most informed about the issues under consideration.

A feature of the measurement of public goods in an agricultural context is the frequency with which the costs and benefits of any particular course of action are separate. A farmer who uses nitrogen to enhance his wheat yields benefits from extra sales and is conscious only of the cost of the fertilizer and its distribution. Costs may be incurred by water authorities some years hence because of the need to reduce the nitrogen content of ground water
required for drinking, part of which has resulted from this application of nitrogen. It is in practice impossible to determine just how much this particular farmer’s actions have contributed to this. In one season, when most of the fertilizer is used by the crop the effect may be trivial. In another, when it gets washed into aquifers before the crop has a chance to use it, the impact may be considerable. This difficulty in attributing responsibility often impedes for the incorporation in agricultural policy of a satisfactory "polluter pays" policy.

V  Policy instruments -- regulation (vs) price/tax incentives and direct income payments

Policy instruments have to steer decisions in directions which modify the operation of the market. The tools available consist of market price support, regulations, the provision of information or the imposition of a rule that "the polluter must pay". Policies may use both "sticks and carrots"; incentives or disincentives separately or in combination. The selection of instruments depends upon their cost effectiveness and their acceptability in terms of cultural attitudes. The successful production of "public goods" will probably require the use of some or all of the available instruments.

Some incentives are of general application. The provision of information and advice, the funding by public authorities of research and development and publicity concerning the importance of public goods may all influence farmers’ actions. It is noticeable for example that both farmers’ representatives and individual farmers are now much more sensitive to the need to farm in an environmentally friendly fashion than was the case some years ago (7). The changing economic environment means that the content of advice and the direction of research need to shift from a purely production oriented approach which has characterised much past public research and development and extension.

A decline in the overall profitability of farming affects the supply of all types of public goods. In some places farms may be deserted and buildings left empty. In others, houses which once accommodated farm workers may be sold to commuters from neighbouring towns. Such human movements change the character of rural communities. Public good impacts are affected by the balance of incentives given to different enterprises as well as by overall profitability. A shift between the profitability of arable and livestock farming has important environmental consequences. A boom in cereal production encourages the expansion of field size, the elimination of competing weeds and the developments of monocultures where mixed farming may formerly have predominated. If cereals become less profitable this may be expected to lead to less intensive land uses and to systems which encourage a more varied habitat for wildlife (8). Changes in the physical environment as a result of reduced assistance seem likely overall to be beneficial. The expansion of intensive production, as a result of past levels of assistance, into areas which may be marginal has sometimes resulted in soil erosion in areas such as steep slopes or in salination of land which has been irrigated. In New Zealand, where farm support has been drastically cut, long term improvements
have taken place in soil conservation and condition, in water quality, in wildlife and the protection of threatened species (9).

The provision of particular public goods may be encouraged by payments linked to specific actions by farmers. In effect this makes the apparent financial return from farming practices correspond more accurately with its social value. Several of examples exist. In the United States under the conservation provisions of the 1985 Food Security Act, the receipt of subsidies was made to depend upon "cross compliance" with environmental requirements relating to "sodbusting" and "swampbusting", the ploughing up of new land and the drainage of wet lands. One problem of cross compliance systems is that if the basic support for the product is reduced, the incentive to continue the environmentally desirable practice may also decline. Several countries, notably Sweden and Norway, offer grants to upgrade manure storage. In Portugal grants are provided to encourage farmers to afforest land which is subject to soil erosion or to put it down to permanent grass. In the United Kingdom some farmland has been designated as being within "Environmentally Sensitive Areas", (ESAs). In these places farmers receive compensation for farming in ways which preserve the environment, even though they do not represent the most profitable use of that land to produce food. Many countries have schemes to encourage the planting of trees. In Canada, the Permanent Cover Program is designed to encourage farmers to take marginal or highly erosion-prone land out of annual crop production by seeding it to permanent cover, such as forage or trees. In planting new forests attention is increasingly paid to the public good, in contrast to the commercial, aspects of the development. The provision of places for people to picnic, the preservation of wildlife and the planting of varied species so as to enhance the visual impact of the growing forest are all encouraged by state support. Such policies often face a conflict between social and physical environmental goals. Measures which, in order to reduce pollution, cut output are likely to reduce the income of farmers. As a result their ability to provide employment, or even to continue as farmers may be weakened. This contradicts those social goals which seek to retain an existing, traditional pattern of farming. In much of Europe and Japan such social goals are of prime importance. The contradiction may be resolved, in part, by the provision of income supports to compensate for the higher costs. Such payments are likely to increase the apparent dependency of farmers on support. Farmers, and their leaders, have resisted this, preferring to derive their income from selling products. In reality, where such payments ensure the supply of public goods which are demanded, they are just as much for production as receipts for food, fish or fuel.

Persuasion may be reinforced by penalties which raise the cost to the farmer of a practice or input which causes a loss of public goods. One approach is to place a tax on an offending input so as to discourage its use. Such taxes are of general effect and they allow the input to be used where it is of most economic benefit. Taxes on nitrogen demonstrate some of the problems. The demand curve for nitrogen is relatively inelastic. As a result the effect of a tax may be to reduce income and raise government revenues rather than to greatly limit nitrogen application. Restrictions on straw burning are commonly applied, but here, the damage to the public will vary greatly between fields close to roads or towns and those which are remote. Thus public goods costs may be higher in some areas than others and at some times than others. A uniform regulation does not provide precisely the balance between the public good requirements and market forces which may be needed. The
administrative costs of discrimination may be considerable but without it the
economic costs of avoiding pollution may be exaggerated.

Another approach, which uses market pressures to limit a damaging
practice or input is to require the farmer to buy permits, which allow only a
specific rate of use of the input or pursuit of the practice regarded as
environmentally damaging (10). These permits are then sold to the highest
bidder. This ensures both that the aggregate level of pollution is reduced and
that those to whom the input is of greatest value, in terms of its contribution
to production, can make use of it. Taxes and licences to "pollute" seek to
safeguard public goods before damage is done. Sometimes action is urgent and
crucial, as for example when a species is threatened with imminent extinction.
An alternative device is to enforce the "polluter pays" principle. By exacting
a penalty sufficient to pay for remediying the damage caused, the polluter is
faced with the need to assess whether his gains from the offending action
outweigh the cost to society it involves. Where a particular source of
pollution can be identified and where the costs of restoring the situation can
be quantified, this principle can be operated. There are, however, many
situations in agriculture where it is inapplicable. The specific source of
pollution, for example pesticides which cause wild birds to become infertile,
may be impossible to discover. Even if it can be found the determination of a
charge which properly represents the cost of removing the pollutant may be
extremely arbitrary. For instance restoration of the population of birds may
depend more on the next winter’s weather than on the actions which may be taken
to encourage them to replace their lost numbers. If a "polluter pays" approach
is adopted in such a situation, the effect may be to fine the wrong person or
to impose a fine which is too small or too large.

Regulations are widely used to safeguard public goods. They apply
widely to the use of chemicals. Before such chemicals can be used they are, in
most countries, subjected to legal requirements to discover their effect on
human health, on the environment. Although in Australia, the period of
registration can, in two states, be as short as one year (11), it may take as
long as ten years in some OECD member countries. This adds significantly to
the cost of launching agrochemical products. New building developments are
usually controlled by planning regulations. Farming practices which are judged
to be cruel to livestock are commonly prohibited. For example, EC rules impose
a minimum size of battery cages for hens. Regulations can supplement taxes,
subsidies or the enforcement of the polluter pays. Limits on legal rates of
water extraction for irrigation, for example, can be supplemented by subsidies
to build more water storage reservoirs.

The potential of regulation is considerable but it is not without its
limitations. Regulations have to be enforced if they are to be effective. If
the impact on profits of obeying the regulation is considerable a black market
may emerge. Enforcement is costly and if it fails the credibility of the
policy may be destroyed. Regulation requires legislation. This is often slow
and cumbersome and usually difficult to change. In an industry in which
technology changes frequently, lowering production cost to the potential
benefit of consumers, such rigidities may have growing, hidden economic
costs.

In considering the appropriate instruments to use to produce the right
"output" of public goods the policy maker needs to ensure that, so far as
possible, those who benefit are those who pay. In effect this uses policy to create a situation in which the user of the resource receives incentives which would correspond to "property rights" in the provision of socially desired outputs. Given the nature of many rural public goods, such as the maintenance of a diverse wildlife or an attractive landscape, it may be very difficult to identify who benefits and therefore who should pay. If general tax revenue is used it may seem inappropriate that relatively poor town dwellers, who may not see the countryside, should be forced to preserve a pleasing landscape enjoyed by richer and more mobile people. Even within the rural community it is unclear that farmers and farmworkers should face higher costs or lower incomes for the maintenance of facilities which are primarily prized by relatively rich people who have come to live in the country but earn their incomes elsewhere. Some public good provision may yield tangible results in the form of higher capital values. However, although this benefits existing property owners, young people may find it even harder to remain in the villages in which they were born. Such difficulties make it tempting for pressure groups to seek to obscure the true cost of production of a public good or the destination of its benefits. This may be a politically convenient approach but it can lead to a systematic and considerable misallocation of resources.

Policies involve costs. An important element in the selection of policy instruments is where these costs are incurred and how much they are. Policies which prevent farmers' using new technologies will, in a competitive market result in lost income for those farmers who are forced to accept higher costs. Policies which prevent the application of new techniques but shield farmers by imposing restrictions on competition from imports pass on these costs to the consumer. Policies which involve the same restrictions but compensate the farmers from public funds pass on the cost to the taxpayer. The choice of instrument may well be determined by the acceptability of placing the cost of the policy on one or other of these sectors of the population.

Costs may be divided into resource costs and transfer payments. It is the transfer payments which often dominate the political debate. Contentious issues include the ability of the budget to fund a policy, the resistance of consumers to higher prices and the extent to which the farm lobby is able to mobilise opinion in defence of farm incomes. Policy makers, however, should not lose sight of the resource costs of their proposals. OECD "Monitoring Reports" use a definition which includes a broader concept of costs in its assessments of PSEs. Thus there is a need to account for resources used in the administration of proposals intended to regulate the supply of public goods as well as any resulting increase in the volume of resources needed to produce food. Such calculations are complex and therefore may be overlooked in the heat of political debate.

Some public goods costs can be passed on to other countries. Much of the recent debate about the need to provide support for farmers that is not linked to production or factors of production, and can be more economical through better targeting, stems from the international repercussions of domestic policies. Policies designed to ensure that the appropriate supply of public goods is available can also affect world trade and the global use of resources. A policy which reduces production in a rich part of the world, in order to increase the supply of a public good situated there, may lead to increased imports and greater environmental damage where people are poorer. For example, restrictions on the use of fertilizer in a high income country may
encourage poorer indebted countries, who need foreign exchange, to plant more of the crops affected, using even more agrochemicals. In effect the environmental cost is being exported. Such arguments have much in common with fears expressed by trades unions that free trade will mean that workers in poor countries will be exploited, whilst those in competing industries in the richer countries are forced out of a job. Comparative advantage suggests different resource endowments make it rational for countries to use resources differently, in relation to environmental as well as other goods. However, given the international dimensions of some of the public goods which it is hoped to protect, this view is unlikely to commend itself to ecologists.

A particular danger of policies designed to provide public goods is that they may be "hijacked" as a covert means of providing protection for farming activities which are non-competitive. Such policies may add to the list of non-tariff barriers which already impede the efficient use of global resources to produce food. Given the difficulty of measuring the costs and benefits associated with the provision of public goods, the reality that these will vary among, and even within, countries, it may not be easy to demonstrate that a particular policy, which keeps in existence productive activity which would otherwise be eliminated, is not justified on public goods grounds. Such policies need to be open to international scrutiny and a "code of practice" may be required against which they might be assessed. One distinction which might helpfully be drawn is between those policies which are explicitly paid for by governments and those for which support is provided through regulation or some manipulation of market prices. For example, in hilly or mountainous areas public goods arguments might suggest that an appropriate level of grazing took place in order to ensure that erosion or the invasion of braken was prevented. This could justify direct payments to some cattle or sheep farmers determined by technical requirements so far as stocking densities were concerned. It would not justify raising the price of the product to the consumer. Direct budget based payments are open to scrutiny by the taxpayers of the country concerned as well as being visible in terms of international debate about their potentially "trade distorting" implications.

VI Implication for agriculture of proposed changes in policy

The 1987 OECD Ministerial Communiqué recognised that a fundamental change in the direction of agricultural policy was now needed. Two factors in particular were responsible for this view; first, the failure of existing arrangements to raise farm incomes in a cost effective manner, while at the same time causing international trade problems, and second, the need to seize the opportunity to ensure that payments to farmers met a number of objectives.

Much of the present support to farmers "leaks" from the farming community in the form of purchases made from other sectors, rising prices for land (although this benefits existing owner operators) and possibly increased payments for borrowed funds. This stems from the fact that income transfers are often made through increasing the price of the products the farmer sells or by subsidizing the cost of inputs. To benefit the farmer has to use the inputs so part of the gain accrues to the suppliers of inputs and the owner of the land. The extent of a farmer's gain depends on how much he produces, so larger
farmers gain most. Estimates suggest that the ratio of farmer receipts to total cost to the rest of the economy in the EC is of the order of 1:1.4. (12) Thus without imposing added hardship on farmers it should be possible to effect considerable savings in the cost of agricultural support by the use of more efficient policy instruments.

Payments to farmers which were used to buy public goods which would not be available in a competitive market based solely on the production of food can also raise farm incomes. Such payments are not income "support". More properly they are factor incomes paid via the state because private markets do not exist for these goods and services. The payments concerned are not subsidies but incomes earned like those of the army or the police force who are also paid by the State. Payments of this type, for the provision of public goods, should be open to all who can deliver them, not just to farmers. In practice, since most of the relevant public goods are "land-related" it is highly probable that the overwhelming majority of recipients will be farmers.

The need to devise more efficient policies, both in terms of "targeting" and in relation to the supply of public goods has led ministers to decide that the level of support for food production will have to fall and the industry be exposed more openly to competition in the market. In this way artificial incentives which "trap" resources in food production would be removed. This changed approach would affect both the market for goods and the market for factors of production, where agriculture would have to compete with other sectors for its labour and for the capital it employed. A shift in this direction by OECD countries, if it were fully carried through, would lead to a more efficient agricultural sector, in terms of market values, throughout the world. Since both output and input prices would be free to move, only that production which could pay the market price for the resources it used would continue. Trade would increase and prices to consumers in most of the industrialised world fall. The potential economic benefits are very large. The PSE for all OECD countries for which estimates are available amounted to US$141 billion in 1989. This is equivalent to a subsidy per OECD farmer of US$11 000 (13).

A reduction in support would benefit farmers in those countries where production costs are low and who are capable of producing on a competitive basis. Such farmers have been forced to retrench in the face of the support payments made to high cost producers elsewhere and might now expect to expand their businesses profitably. Consumers and taxpayers, too, would gain. Lower food prices are especially important for low income households whilst relief to taxpayers is universally welcomed.

The implications for farmers in those countries which are most highly protected is less reassuring. Following a reduction in support we could expect that farmers whose reduced revenues did not cover even their variable costs would cease production. Especially at risk would be recent recruits to the industry for whom the margin over variable costs became insufficient to cover the costs of borrowings associated with getting started. After an initial shakeout a longer period adjustment seems likely as farmers decide not to renew fixed capital or to continue tenancies which expire and to seek alternative sources of income. If the withdrawal of support is abrupt more farmers will be forced to drop out of production immediately. If a more gradual approach is adopted the pace of change is likely to be influenced by farmers’ retirements.
Where a farmer has no successors who can fully cover all the costs involved in continued production, land is likely to be absorbed into adjacent businesses or to be utilised on a part time basis, rather than continued as a separate, full time, farm enterprise. Since, markets are overloaded product prices will need to fall until, eventually, many farms cease to be independent businesses. Whether rapidly or slowly a change must take place in the distribution of farm assets, with farm land passing to operators capable of making a profit at lower prices and the agricultural sector being substantially restructured.

In many parts of OECD part time farming plays a major and growing part in rural employment. In effect this supplements income from farming with returns from other activities in the economy. One implication is that any reduction in revenues as a result of reduced levels of support will have a smaller proportionate effect on family incomes than it will for full time farmers. The implications for the natural environment will depend on the particular pattern of farming which results. In so far as this is less intensive it may well represent an improvement in terms of ecological variety and value. Part time farming can help to keep in the countryside those whose roots lie there and whose skills are needed if farming is to continue.

There are many possible part-time activities compatible with farming. In some instances they may involve little more than a few hours work for a neighbouring farmer. In others a farmer may set up his own ancillary business, for example, in tourism or contracting. Some part-time farms will be residential, accommodation first and farms second. Especially where a small farm has an attractive house, the value of the farm may depend little on its output from farming and much on sources of income earned elsewhere. Market forces alone seem likely to push many farms in this direction, especially where they are in close proximity to alternative urban earning opportunities. Policies may seek to encourage part time farming by supporting other non-farm activities in the countryside. In effect some of these policies may create an explicit "market" for "public goods". In this sense they are "corrective", helping to ensure that resources are distributed more satisfactorily. Should they simply support non-farming activities which have no "public good" rationale, there is a risk that distortion in the agricultural market may simply be replaced by distortions in the markets for other goods.

Although the reduction of support has clear merits in relation to market criteria, it takes no account of externalities. There may be some gains. A less intensive system of farming, which seems likely to result in some places is generally seen as environmentally favourable. However, if the present net contribution of agriculture to the supply of public goods is believed to be positive, it can be argued that a reduction of government support for agricultural production might not lead to a better allocation of resources between sectors. To correct this policies designed to provide incentives to produce positive public goods may be needed. There are practical difficulties in devising any policies which have no impact on the production of traded goods. A policy which sustains traditional pastoral production in mountainous areas in order to avoid avalanches or soil erosion, will add to the volume of milk and meat on the market. If the product market is allowed to find its equilibrium, this extra production will mean lower prices for other producers.

This difficulty may be eased conceptually, if not politically, if this part of food production is regarded as a by-product of protecting the
environment. Like other by-products it has to be sold for what it can fetch. Provided the total return, including that from public goods as well as from the market is sufficient to fully cover the cost of the resources used this cannot be regarded as a "distortion". In practice it may be difficult to distinguish in any objective manner inducements which relate to environmental goals from those which are simply covert subsidies to food production.

The previous paragraphs have argued that the reform of agricultural policy implicit in the OECD Ministerial Communiqué, and in the undertakings given when the GATT Uruguay round began must lead to a change in the amount of resources used in agriculture and in the way they are used. By providing for public goods to be properly remunerated a better allocation of rural resources can be secured. Several specific changes relevant to the supply of public goods can be inferred:-

The deintensification of farming

Reduced support is expected to reverse the tendency to intensify farming which has resulted from the past level of price support and the removal of market risks which has been characteristic of agricultural policies in many developed countries. This in itself is likely to lead to an improvement in the physical environment. The New Zealand experience suggests an overall improvement although it notes that the removal of support may not in itself be sufficient to ensure the continuation of some valued environmental public goods and may lead to the neglect of some areas of land left fallow.

The impact on the social environment is much less likely to be favourable. Depopulation, ageing of residual populations, the withdrawal of services which have become unrenumerative and the growing dependency of many in the population on social security represent a loss to society as a whole. In time this may be overcome as new businesses come in to use available resources and as people move to new locations. However, in the short run there may be a need for policies that help to maintain the rural population and while it adjusts to its changed circumstances. The migration of employment and population from the cities may reduce the attractiveness of life there for those who remain. However, the dimensions of this shift are likely to be modest in comparison with other macro-economic factors which will influence the level of demand for labour in urban locations.

The pace and extent of change

The pace of change is important in the context of the provision of public goods. If change occurs gradually the opportunity will exist to identify, almost by trial and error, those public goods which are most valued. The political process will ensure, in countries where freedom of speech exists, that there is a keen awareness of losses. It may be less equipped to identify any public good gains which flow from a reduction in food production. Such benefits may need articulation by the industry if they are to be recognised and rewarded.

If change occurs suddenly then governments will have to decide very rapidly what public goods they wish to retain and what measures will achieve
these ends. Given the measurement difficulties indicated above and the
problems of choosing and using appropriate policy instruments, this is unlikely
to be a very exact process. Where the creation or retention of public goods
appears to require substantial public expenditure there is likely to be a great
reluctance to move ahead of public opinion. The outcome might well be a
smaller provision of public goods than is justified.

The dynamics of the market

One of the important targets of agricultural policy reform is to make
the industry more responsive to the market. This implies a continuing process
of change in the volume of resources and the way in which they are to be used
in farming. There are likely to be considerable public goods implications.

Changes in the mix of resources may be needed either because of the
introduction of new technology or because of shifts in consumer demand. A good
market system must be responsive to either. New technology has tended, in
recent years, to require farms to be larger and to employ fewer people. There
is little reason to expect this process to change in the near future in Western
Europe or in Japan. To retain those public goods which are associated with
current, more labour intensive forms of production, will require policies which
explicitly identify and reward them. The costs of such policies seem likely to
rise as technology offers yet more ways of producing food at low cost.

Improved market access

Improved market access as a consequence of market reform, is not without
importance for the provision of public goods. Freer trade would mean that the
price available for domestically produced goods would approach that at which
similar imports can be made available. However, domestic products are
associated with a supply of public goods which do not necessarily accrue with
imports. Their value to society is therefore greater than the price of
competitive imports. If the sourcing of supplies is to reflect the social as
distinct from the market value of output, then home producers will require
additional rewards other than those which come from the price of the food they
sell. Such rewards raise a number of difficulties. First, there is the
problem of their evaluation. We do not have an agreed objective measure for
public goods. Second, there is the need to find funds from the public purse if
such public goods are to be rewarded in the context of a market which is open
to suppliers from all parts of the world. The budgetary element is visible,
competes with other public spending objectives and requires judgements which
have a high political visibility. Third, even if the intellectual case for the
separate reward of public goods is accepted, there is a danger that the
implementation of such practices may give rise to the imposition of barriers to
trade which it are indistinguishable from those used by some traditional forms
of agricultural protection. In effect the goal of improved market access,
which is one of the central features of the call for reform, will have been
undermined (14).
Implications of reform for land use

Agriculture is the dominant land use in most parts of OECD. Land use has implications for the supply of such public goods as clean water, open recreational space and the appearance of the landscape. Changes in agriculture are thus of especial importance for this group of public goods.

The expectation that less land will be needed in farming stems not only from changes in policy but also because of anticipated increases in productivity. Some land may be allowed to revert to wilderness but in regions as densely populated as Europe or Japan this is unlikely to account for large areas. Some land may be absorbed by forestry, the other major land using rural industry. Agro-forestry, where trees and farming coexist, may create landscapes and habitats of exceptional public good value. In some locations deciduous, broad leaf trees may have high amenity values which justify planting even where returns from the market alone would not make this a commercial venture. Recent proposals for "Community Forests" in the United Kingdom take account of the social value of some types of afforestation in a relatively densely populated country. Such developments may absorb some land currently used for agriculture. More typically, however, land seems likely to be farmed less intensively. A reduction in the use of other inputs, capital and labour, will tend to depress yields and so require larger land areas per unit of output. Such a tendency might, in the long term, be expected to lead to increases in the average area of farms. However, the land market is determined by many other factors than its profitability in farming, e.g. planning regulations, the way in which taxes on capital are administered, interest rates and expectations about inflation. As a result any tendency for farm sizes to increase, may be modified by other forces at work in the land market.

The public good implications of any increase in farm size need consideration. Larger, more extensive farms will use less chemical inputs per unit of land (15). This may be regarded as likely to improve the quality of the environment both by allowing more wildlife, plant and animal, to survive and because the pollution of water courses and ground water is likely to be reduced. However, if farm enlargement leads to the existence of derelict farm buildings, the neglect of farm boundaries and the failure to maintain ditches, the appearance and usefulness of the countryside may suffer.

Implications for the rural population

Reform which leads to the downward pressure on agricultural profitability will mean that fewer people can find incomes in agriculture. The largest number of people affected are in those regions in which farming still represents a substantial share of full time employment, in the south of the European Community, for example. For these areas the possibility of finding alternative job opportunities in the same location in a short period of time are very limited. Agricultural depression may mean rural depression and the accelerated outmigration of the younger and more enterprising members of the community. Such population movements may well play an important part in the long run process of making best use of the resources currently engaged in farming but they do have some heavy costs in terms of public goods.
Rural depopulation, originating in the decline of agriculture, has cultural costs. Many of the distinctive cultures within nation states are rural in their location. Language, customs and traditions may be lost as the need to adjust to a predominantly urban civilisation forces change in the training and occupations of those born in the countryside.

It is too gloomy to see these changes as all negative. The decline of farming may create opportunities for existing country dwellers to develop new skills and for people from other environments to come into the rural areas. Such changes may enliven the traditional village, extend the range of its cultural life and awaken young people to opportunities of which they might have remained unaware had farming continued to employ them. The changes which are taking place represent the birth of new rural societies rather than just the death of one which depended exclusively on farming. Moreover, where reform leads to greater agricultural profitability, in New Zealand, for example, this may result in more employment opportunities in the sector.

The implications of agricultural reform for the supply of public goods
-- a summary

This discussion implies that the impact of agricultural reform on the supply of public goods will depend on the pace at which change takes place, the way in which markets subsequently evolve, the speed with which land shifts to new uses and new structures and the flexibility with which rural communities are able to respond. In each case there are likely to be pluses and minuses so far as public goods are concerned. Rapid change is likely to lead to greater savings in the market economy but presents great difficulties in identification and retention of public goods. The need to allow for later shifts in the market means that the balance between market values and public good values is continually changing. As a result "public goods" policy too will need progressive adaptation. Movements in land use are likely to conflict with traditional concepts of the small family farm but the retention of many small part-time farms may help to offset this. In general the more extensive use of agricultural land seems likely to be a positive feature in terms of public good values. The most acute social public good losses are likely to be in remote rural regions which rely heavily on farming for employment. Even here in the longer run the development of new patterns of community may prove the most satisfactory way of adjusting to the need to reform agriculture and the desire to retain in these regions viable rural communities, although the maintenance of landscapes and natural resources may be dependent on the continuation of some kinds of agricultural activities.

VII Income support and the provision of public goods

One way of reconciling the goals of a more efficient agriculture, improved world markets, an appropriate recognition of public goods and the maintenance of farm incomes, would be direct payments to farmers. "Pure direct income support measures may be defined to include all explicit (monetary) transfers provided by public budgetary funds to all or a specific group of agricultural households, not based on past, present or future production or
factors of production and with no conditions or stipulation concerning the use of the transfers" (16). If the scope for improvement in the transfer efficiency of agricultural policy were exploited, farmers net incomes could remain unchanged, despite reduced profits from farming and without an increase in the cost to taxpayers or consumers. In principle, since agricultural policy reform must lead to an increase in global economic welfare, society would be able to afford such payments. The gains from a competitive agriculture (lower food prices and more efficient overall resource use) together with the improved supply of public goods would more than compensate for the costs of compensating farmers and ensuring an appropriate array of public goods. In practice the implementation of direct income policies would be likely to involve some difficult decisions concerning equity.

A first requirement is to establish a basis for payment. Several potential public goods grounds for income support can be considered.

a) Farmers may be paid directly for continuing to produce a public good. This is likely to involve specification of an approved farming practice and administrative machinery to ensure that it is carried out. Such schemes should in principle be open to all potential suppliers, whether existing farmers or not. They do not amount to a transfer payment but a reward for providing a service, equivalent in conceptual terms to the salaries of policemen or civil servants. In this sense it may be wrong to call them "income support" at all.

b) Payments may be made to ensure that there is a supply of some new public good which society now wishes to enjoy. For example, the construction and maintenance by farmers of new rights of way and facilities on farms for walkers who wish to visit the countryside.

c) Some of the aids paid to facilitate structural adjustment may have a public goods aspect. Farmers would receive income to cushion them whilst they adapted to less intensive systems, for example some types of organic farming. Such income aids would allow a realistic period for structural adjustment to a pattern of farming which was judged to be of greater social value.

d) Some stabilization aids, which help farmers cope with short-lived downturns in receipts from the market, may have a public goods aspect. They may preserve valued rural communities which have few alternative sources of income and whose agricultural output normally finds a profitable market.

e) Income aid may also be provided as a means of providing farmers with a minimum level of income which is regarded as appropriate in terms of societal values. In this sense it may be described as providing a public good. This may be justified if for some reason farmers are excluded from the normal social security provisions of the country to which they belong.

Once a basis for payment has been decided there is a need to devise methods of application. These need to address the questions of transfer efficiency, of equity in terms of who pays and who benefits and of
compatibility with the need to ensure that resources are used more efficiently 
in farming.

Payments to encourage farmers to produce a desired level of public goods 
may include both incentives and disincentives.

One incentive approach is to pay farmers to farm in a traditional way. Where this is the case then the "traditional way" has to be defined. It is not 
clear how far back in history the policy maker will need to go in order to 
establish what is "traditional". Nor can it be assumed that a simple 
historical model will suffice. Much old fashioned farming involved arduous 
physical labour which burdened and shortened the lives of farmers and farm 
workers. Once agreed the farmer concerned will need to be given clear workable 
instructions. There will also have to be a clearly specified means of 
monitoring performance. As more efficient techniques are applies elsewhere the 
profitability of the farming activity is likely to decline. Thus the payment 
needed from the public purse will grow in real terms, if the same of farming 
system is to be preserved.

More precise incentives may relate to some particular public good. For 
example, to plant a hedge or leave a field free from chemicals. Payments need 
to be related to the additional costs implied. These will include both the 
immediate costs in terms of establishing the hedge and the indirect costs such 
as lower yields from the invasion of crops by pests or diseases which chemicals 
would have prevented. To be workable such an approach has to be within the 
framework of a farm business which is viable overall. Where the commitment 
takes several years to accomplish there may be a need to place a covenant on 
the land so that successor farmers will observe the same restraint on the same 
conditions. The New Zealand approach to the integration of agriculture and the 
environment envisages just such an approach (17).

One route to encourage the production of public goods is to use some 
form of "cross compliance". In the United States farmers qualifying for some 
forms of support already have to restrict their farming activities in ways 
designed to protect the environment. Such an approach is a mixture of 
incentive and disincentive, once committed to a support programme the costs of 
failure to comply are very high.

Most agricultural policies have sought to stabilize markets. The public 
good element in this relates to the need to avoid the resource costs of an 
alternation of agricultural expansion and contraction in markets which change 
only slowly, to protect poorer consumers and to manage the economy. The 
instrments chosen have usually been based on state support of markets when 
they are weak. In principle, however, the benefits should be attainable 
through some form of insurance or tax averaging which would be essentially 
self-financing. For poor consumers, it may be necessary to provide selective 
support when food prices rise. There are several means of doing this, for 
example through varying social security benefits in relation to changes in food 
prices. Another approach would be to use the sort of Food Stamps scheme 
already applied in the United States.

One of the most difficult areas is where payments might be made on the 
basis that compensation is required because without it incomes would fall to 
unacceptably low levels. There is a need to make sure that such payments do
not distort the operation of markets or specific incentives to supply public goods. This is very much the field of "pure" income aids. An attractive approach to such problems is to provide compensation in the form of a capital bond. The bond would be designed to provide an annual payment for a period of years which corresponded to the loss for which the farmer was to be compensated. Farmers could, if they chose, sell the bond and use the capital sum to finance a move from farming or the modernisation of his farm within the framework of competitively determined prices and public good constraints and incentives. Alternatively, they could, within the same pattern of incentives receive an annual payment. Such payments would be production neutral and yet capable of providing compensation for those farmers who were most hard pressed either because of their small scale or because of the severity of the rate of adjustment required of the industry (18).
Notes

1. Externalities arise whenever a person’s production or consumption decision directly affects the production or consumption of others, other than through the market place. For example the pollution of ground water by chemicals imposes a cost on those who later extract this water with the intention of using it for human consumption.

2. It is worth noting that one of the implications of reduced barriers to agricultural trade could be an environmentally beneficial reduction in the intensity of farming in some regions of the world.


4. In April 1989 the Trade Negotiations Committee within GATT called for "substantial, progressive reductions in agricultural support and protection". This is therefore the proposed outcome of negotiations in this round.


6. Refer to Bibliography at the end of this text.

7. It is worth noting, for example, that in a recent competition to establish the Farmer of the Year, in the UK, organised by the Reed Publishing Group, special emphasis was laid on the contribution the winning farm made to the improvement of the environment. {Farmers Weekly}, 12th October 1990.

8. Some of the environmentally damaging aspects of cereal production include: damage to water quality, soil degradation, pesticide residues, lost species diversity and lost habitat for livestock.

9. However, in the short term there may be negative effects on, or smaller improvements in the environment.

10. In New Zealand, for example, transferable water permits are used as a device to regulate the use of water for irrigation.

12. See Land Use and Food Policy Inter-Group (LUFPIG) of the European Parliament report ("A Future for Europe’s Farmers and the Countryside,"
) Brussels, November 1990. An IATRC estimate suggests, similarly, that it takes $1 of subsidy to transfer ¢40 to farmers.

13. See OECD, forthcoming 1992, ("Agricultural and Environmental Policy 
(Integration: Recent Progress and New Directions").

14. See Young, T. and Allen, P.G., Methods for Valuing Countryside Amenity:
An Overview, in: (Journal of Agricultural Economics) (September 1986),
Vol. XXXVII, No. 3 and also Marsh, J. (1988), An EC approach to
De-Coupling in: (World Agricultural Trade: Building a Consensus), Eds
Miner W.M. and Hathaway D.E., Institute for Research on Public Policy,
Canada.

15. Some authors suggest experience in Australia of farmers following
chemical-free agriculture shows that this type of farming can be as
profitable as conventional agriculture. See Wynen E. and Edwards G.
Towards a comparison of chemical free and conventional farming in
Australia in: (Australian Journal of Agricultural Economics), Vol. 34,


17. OECD (Agriculture and the Environment: Integration of Policies 
(-- Response from New Zealand on Recent Developments,) ENV/EC/AGR(90)1.

18. For an outline of such a scheme see report of the LUFPIG group of the European Parliament.
Bibliography


COUNTRYSIDE COMMISSION (1988), {A Review of Recent Practice and Research in Landscape Assessment}, CCD 25.


