Centre for Agricultural Strategy

Investing in rural harmony: a critique

Edited by A Korbey

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3 Economic Pressures on the Enviroment

D Colman & W B Traill

There has always been conflict between settled agriculture and naturally evolved habitats and ecosystems. However, agriculture is not always harmful, it has created new rural environments which include many of the most prized aspects of the landscape. As the scale of agriculture changes, along with the technology employed, so also does the landscape itself. Since agriculture in the UK is currently going through a period of growth and intensification the impacts on the rural environment are particularly rapid. Many of these are, of course, irreversible or very difficult to reverse.

Seen from the economist's perspective the changes taking place can perhaps best be analysed by attempting[1] to distinguish between the changes which (1) would occur in the absence of agricultural intervention policies as those controlling the main resources in agriculture (land and capital) sought to improve their living standards and economic returns in line with those from the non-farm sector and, (2) those superimposed on (1) by the effects which agricultural policy has upon resource allocation. In analysing the second category it is useful to distinguish between the effects of EEC policy, over which the UK has little control, and those of UK national policies which can more readily be controlled.

AGRICULTURAL ADJUSTMENT IN THE ABSENCE OF GOVERNMENT

If government had no involvement in UK agriculture *(ie* if there were no subsidies, import levies, export refunds, or intervention buying) producer prices for traded agricultural outputs and inputs would be determined by international market

prices. Through time, agriculture would not remain static, but would be forced to respond to a host of changing economic forces, among the foremost of which are those which affect international prices of agricultural products, non-farm incomes in the UK, and technical change in UK agriculture.

There would still be technical progress in agriculture as individual farmers attempted to increase the productivity and profitability of their farming operations. The example of the innovators would typically cause other farmers also to adopt the technology. Similar processes of technological change would be simultaneously occurring in other countries and, on broad historical experience, would cause agricultural supply to expand more quickly than demand, with the consequence that international agricultural prices would fall. Technological change in the UK might be either faster or slower than in the international system in general; if faster its output would tend to grow, if slower its total output would contract. In either event UK producers would have to introduce new technology in order to overcome the effects of lower prices on their profitability and standard of living. If at the same time incomes were rising in other sectors of the economy this would intensify the pressure on farmers to make adjustments in resource use which would help maintain or raise their income.

Some farmers would successfully make the sort of resource-use changes required to maintain viable farming enterprises. In this process they would typically expand their holdings. While this might, in part, be a result of bringing new land under cultivation, it is typically mainly as a result of other farmers deciding to leave the industry and making way for the remainder to expand. Some older producers faced with the need to adjust would typically decide to sell off their farms and live off the assets released, as might farmers with no heirs. Other farmers, after weighing up the opportunities for careers outside agriculture, might also conceivably opt to leave agriculture. In parallel fashion, there would also (given current taxation laws) be a reduction in the number of tenancies, as tenants voluntarily left agriculture (for the same reasons as selling farms) or as rights of tenancy lapsed.

There is little reason to suppose that, in the absence of government intervention, the new types of technology developed would be markedly different from what has been observed over the last few decades. Technical change in the farm machinery and building supply industries has certainly had the effect of reducing the capital to labour price ratio (at least when quality changes are correctly taken into account), and this has led to increasing capital intensity and displacement of labour; mechanisation in particular has facilitated and encouraged the growth in average farm sizes. Biological technical change (improved seed varieties, genetically improved livestock breeds, etc) has tended to favour the expanded use of purchased inputs, since it allows profitable response to higher levels of fertiliser, pesticide and

concentrate use plus higher stocking rates. All, of course, have adverse environmental consequences. Individual farmers adopt this technology to try and increase their profit margins. As other producers follow their example output prices fall, creating pressure for new waves of innovation in order simply to maintain their incomes. This is the well-known 'treadmill effect'. It is a treadmill which farmers run on whether or not there is government intervention in agriculture.[2] In essence the biological technology does not of itself create pressures for increased farm sizes or displacement of labour. On the contrary biological technological change provides an opportunity to increase output from a fixed or even declining area of land; although the demands of improved financial management, as a greater proportion of final output is spent on purchased inputs, may favour larger farms. Rather it is the changes in mechanical and building technology (which accompany the biological changes) which create the main opportunity and also a spur for increasing farm size.

While, as already noted, it is conceivable in principle that, if technological change in UK agriculture was especially vigorous, UK agricultural output, livestock numbers and area cultivated could increase in the absence of price supports, it must be deemed highly improbable. It is far more reasonable to assume that, in line with historical experience, the UK agricultural sector would through time decline in size. There is, of course, no inconsistency between this and the idea that individual farms would continue to grow, since the equation would be balanced by the rate of reduction in farm numbers. This would be accompanied by a general reduction of both hired labour (in particular) and farm-family labour. It would also be accompanied by the cessation of farming on much land in the Less Favoured Areas, where continued farming relies upon various special price and income support measures, and the reversion of marginal land elsewhere to a natural state plus more extensive grassland farming in other areas now supporting intensive dairying or cereals. From a conservationist standpoint there would be much less pressure from agriculture on wildlife habitats, such as wetlands and woodlands, and lower levels of pollution from animal and chemical wastes. Also land prices would be lower, making it easier to acquire land for conservation purposes.

To summarise this section; even without government involvement, agriculture would be constantly adjusting to changing economic forces, both international and domestic. The major developments would see the total area falling, the labour force declining, farms becoming larger and capital intensity and the use of other purchased inputs increasing.

PRESSURES INDUCED BY AGRICULTURAL POLICIES

Government policy towards agriculture has traditionally taken two main forms: price policy (any policy which results in producers or consumers receiving or paying different prices from free trade levels); and policies relating to input markets (often called structural policies). The goals these two sets of policies are trying to achieve are somewhat obscured by the political statements of objectives, as set out in documents like the Treaty of Rome. The actuality is often somewhat different, but the stated objectives almost invariably include efficiency, stability, guaranteed supplies (self-sufficiency), producer income support and reasonable consumer prices. It is not within our remit to provide an overall critique of agricultural policy as applied in the UK either before or after EEC membership – this is admirably done elsewhere (see, for example, Bowers & Cheshire (1983)). We will limit our dicussion to an examination of the ways in which the actual policy instruments employed influence the rural environment.

Price Policy

We begin with a consideration of price policy, which in developed countries has almost universally come to mean the raising of agricultural prices to levels above free market (world price) levels. The mechanism for achieving this can take a number of forms, such as producer subsidies (the old UK method), import levies (tariffs) on imported products and export subsidies on exported products (the EEC method), and production quotas to raise the price of untraded items (eg on potatoes in the UK). Whatever the method chosen, high prices for farmers in the absence of output control can be expected to have the following principal consequences:

(i) Expanded agricultural output. This would result firstly from an increased intensity of production. Input levels which would otherwise have been unprofitable would become profitable, resulting in higher levels of feed use, higher stocking rates, greater use of fertilizer and pesticides, and more capital per unit of land. Secondly, marginal land would be farmed which would otherwise remain idle, and 'improvements', such as draining marshy areas and clearing wooded sites and hedgerows, would to some extent become more profitable. Likewise it would be worthwhile to raise the productivity of land already cultivated, by drainage. That is, high support prices increase the pressure on the natural environment and put agriculture in conflict with conservational interests.

(ii) More farmers on smaller farms. At the time when new higher support prices are introduced, as into UK agriculture between 1973 and 1978 (the Accession period for joining the EEC), farm incomes rise. This reduces both the incentive for farmers to seek employment outside agriculture and their

need to expand the size of farm business in order to maintain incomes comparable with earnings potential elsewhere. The number of farms is likely to be larger and the average size of farms smaller than if world market conditions determined prices. A further point about the effect of price support on farm incomes is, as many authors have pointed out (eg Josling *et al*, 1972; Traill, 1980; Bowers & Cheshire, 1983), that income distribution effects are highly skewed. That is, the largest and richest farmers gain most since payment is proportional to production. This encourages concentration in the operating and ownership structures of agriculture – a force running counter to the one just mentioned.

As far as hired labour is concerned, economists would predict that demand and employment would expand as a result of high product prices. There is, however, some evidence to suggest that farmers' response to high prices is to invest in new labour-saving equipment and that the employment of hired labour actually falls in response to supported product prices (Traill, 1982).

However, unless the gap between policy supported prices and those which would occur without intervention continues to increase, the amount of change in the former will become equal to the latter. That is, producer price changes will be exactly as if determined by underlying international market conditions, but will be higher by (in essence) a fixed amount. In this situation the natural forces of adjustment re-assert themselves and the movement of resources out of agriculture would bear a close relationship to that which would happen in the total absence of a support policy. Note that the present situation in the EEC is very similar to this in that during the last two years CAP support price rises have been held below the rate of inflation and have not widened the margin over 'world' prices.

(iii) Land prices and rents increase. Prospective buyers are able and willing to pay a higher price in the belief that prices will continue to be supported. This tends, through time, to erode, and even eliminate the gains in farm incomes – the beneficiaries are those who own the land at the time of any price increase, not those who subsequently buy land or rent it from them – and also locks new farmers into intensive production techniques which are the only means available to them to generate the necessary incomes to meet repayments or rents on the inflated land prices.

The extent of some of these changes is illustrated at the aggregate level in a simulation model of the UK labour and capital markets (Traill, 1982). The simulation estimates are that in the long-run the effects of a 1% increase in farm support prices will cause (i) the capital stock of agriculture to increase by around £44m or 0.4% (mostly in the form of plant and machinery), (ii) employment of hired labour to fall by almost 1% – a controversial estimate – and (iii) farm income

and land prices to increase by around 10%. Given the extent by which UK farm prices exceed world prices these imply that price policy has had a marked distortionary impact on land prices, capital stock and employment in agriculture.

In addition to these widely recognised repercussions, price support policy also has more subtle effects which are difficult to quantify. For example, what is its effect in what is termed 'inducing technical change and innovation'? In other words, do higher prices provide incentives for research to produce new products (better tractors, combine harvesters, milking parlours, higher yielding seeds), which would not otherwise have been developed or adopted? Evidence is growing that economic incentives are important in determining research activities and rates of productivity growth. Many of these effects are naturally irreversible (technological knowledge rarely gets lost), but lower product prices would probably slow down the pace of future technical progress.

It is often argued (usually by farmer lobby groups) that the response to a reduction in support prices would be for farmers to expand output in an effort to maintain their incomes. While this might conceivably happen in the very short-run, there is no empirical evidence to support the idea of it happening in the longer run. A condition for such a perverse reaction to prices would be that at the time of the price fall farmers were underutilising their capital stock and employing inefficient production methods to generate a 'satisfactory' income. Inevitably surplus capacity of this type would be quickly used up, and the available evidence points to the fact that output price reductions lead to reduced output and resource use.

This is not to say that reducing support prices is without its difficulties, for as has been stated previously (Colman, 1983): 'high farm prices have created something of a policy trap. Farmers have reacted to the secure environment created by policy, and the most dynamic among them have made extensive new investments in buildings, machinery, land and livestock in order to expand production particularly of cereals and milk. While these producers and farmers have rightly made use of the grants and tax allowances available for this investment, they have nevertheless bought assets at high prices using money borrowed at high interest rates. In view of the European surpluses of milk products and cereals this investment may not have been socially justified, but the producers who undertook it acted rationally on the basis of expectations induced by recent policies. Any reversal of policy would lead to great financial problems for precisely those dynamic and often younger farmers who have been responsible for much recent investment.'

Naturally, the faster the reduction in price support, the greater the disruption, and any major policy changes should be phased over a reasonable period.

We have been talking, thus far, about price support in the absence of pro-

duction control. If, however, prices are raised with a view to enhancing farm incomes (however inequitably) but production quotas are simultaneously imposed, most of the adverse effects of the policy are removed, and there will be relatively 'beneficial' consequences for farm sizes and numbers. That is, since production expansion is no longer possible, the incentives to increase the intensity of production and expand the area of production are removed (though there would remain incentives towards using more capital at the expense of hired labour and to employ other cost-reducing methods). At the same time, the raising of farm incomes reduces the incentive for farmers to leave the industry or expand their farm size.

These remarks, of course, apply to across-the-board quotas on all products. Quotas on individual products, such as those being recommended for milk, would simply result in substitution of products which are not controlled by production quotas. In the case of milk, the main substitute is probably cereals, and the consequences for the rural environment of expanded cereal production could be more severe than the consequences of intensive dairying.

Input Grants and Subsidies

From the point of view of conservation and environmental concerns the impact of such policy instruments as drainage grants, capital grants and tax allowances are more directly obvious and damaging. Moreover, the implementation of these measures is almost entirely a question of national policy (rather than of supranational, EEC policy) and should therefore be more readily amenable to change.

What are the objectives of this class of measure? At an immediate level the purpose of drainage grants and capital grants is to stimulate new investment and the replacement of worn-out capital. They do this by having the taxpayer contribute to the costs of the investment and thus increasing the profitability of farmers' private investments. The underlying rationale of this type of policy is however far from clear; why should governments transfer taxpayers' money to farmers in order for them to make private profits? Since (see Potter, 1983) most of the grants go to large farmers, it can hardly be argued that the objective is to help small farmers stay in business. In view of the fact that much grant-aided investment has been for purposes of cereal and dairy farming, and these products are already in surplus supply and increasingly costly to dispose of, it cannot be realistically argued that more investment is needed to encourage expansion of supply (to achieve greater self-sufficiency or to promote the balance of payments). Furthermore it would be positively ignoble, especially since there is no economic justification for it, to suggest that an objective of such policies in the UK is to ensure that the UK maximises its share of EEC output and extracts 'its share' of the FEOGA budgetary cake. It is true that the recent changes in available grants

will mean an increased emphasis on supporting investment in the LFA's, where according to Directive 268 the European Commission requires that agriculture be supported as a 'means of considering the natural environment and rural population'. Nevertheless, the main instrument of support for the LFA's remains livestock headage payments which may have encouraged overstocking and environmental damage. Thus in the absence of clearly defined external social benefits which farmers are unable to capture, it is difficult to see precisely what objective these investment subsidy policies are intended to achieve.[3]

What is clear is that much grant-aided investment is of doubtful social value according to any conventional calculus. To take a simple, but relevant example; consider a drainage project costing £1 000. To be worthwhile from a social viewpoint this would need to generate output worth £100 in perpetuity at a discount rate of 10%. This output should be valued at its worth to society, which economists generally accept to mean at 'world' prices minus the value that society places on any damage to the environment. To a farmer in a Less Favoured Area receiving a 60% grant, and prices (say) 50% above open market prices, this project would become profitable when the social value of the extra output, *ignoring any environmental damage,* is a mere £26.7 per annum. That is, the project has a private profitability of 10% when social profitability is only 2.7%.[4] This illustrates starkly how the combination of grants with price support causes investments to take place which are disadvantageous from a social point of view. Moreover, in the example, at the rates of grant and price support assumed, the contribution of the grant to this discrepancy in private and public value is about twice that of the price support. Thus the present system of investment grants (especially since grants appear to be a permanent element of policy) constitutes a major stimulus to what may be seen as socially undesirable investment. Since there are often clear environmental costs associated with land drainage, hedgerow grubbing and copse clearing, but few discernable social benefits other than additional output, the policy of making grants for these purposes deserves continued critical attention. Already the decisions announced in December 1983, for the UK, to eliminate grants for reclamation of land or the improvement of grassland, except in LFA's, suggests that policy makers have begun to accept that such policies have doubtful benefits.

An aspect of current investment grant policy to which Potter rightly draws attention, is the change in procedures following the 'Rayner Review' of 1980. As a consequence of this the need for prior approval by ADAS and MAFF is now no longer necessary (except in 'sensitive' areas) for grant aid to be provided for investment. The procedure has been 'streamlined' so that farmers are now able to carry out work and claim retrospectively for the grant. While this may represent a recognition that most grant applications have traditionally been accepted,

it does, as Potter indicates, remove a mechanism for imposing conservationally-oriented constraints on publicly supported agricultural investment. But it has done more than this. It has helped to create an impression to all concerned that farmers have a *right* to investment grants, which in turn conditions acceptance that where this 'right' is withheld (for whatever reason) farmers should be compensated for its loss. It can be seen as singularly unfortunate that the system of investment grants appears to have given rise to a situation in which individuals are able to claim as a right from society something which is socially damaging. Since social damage occurs where the rights *(eg* to clean water, access to paths and woodlands etc) of other members of society are damaged, this point is of central concern. Conflict between agriculture and environmental interests is a conflict between the rights which farmers have in land and the rights which society reserves for itself. That society should pay for additional rights to farmers which society sees as increasingly against its own interests is paradoxical, as also is the fact that, in the form of Potter's APAS proposal, we should now be examining policies which accept the existence of these additional rights. What society has the power to confer, it also has the right to take away.

POLICY OPTIONS

Where there are significant divergences (or in terms of the jargon of economics, externalities) between social and private benefits and costs, economic theory indicates that the most direct way of correcting for them is through appropriate taxes or subsidies. Where the action of an individual might impose external costs on others an obvious corrective mechanism would be to impose a tax on the action which is equal to the damage caused. The tax collected could then, in principle, be used to compensate those suffering the external costs. Where the action of an individual confers external benefits on others a subsidy is appropriate.

In assessing agriculture's external costs upon the rural environment, many different externalities which might incur taxes have been identified. These include ploughing of old meadows; pollution from intensive livestock production; hedgerow grubbing (plus a deterioration of hedge quality as trees are not replaced); pollution arising from high fertilizer and insecticide use; the encroachment of farming into wilderness areas, copses and wetlands. However, few have actually suggested that harmful external effects of these types be managed by means of taxation; Sandiford (1984) has clearly indicated just how difficult it would be to tax farmers for any pollution they caused. Alternatively, there are activities to conserve aspects of the rural environment or to provide amenity which can attract subsidies. At present capital grants are available for labour-intensive conservational works to improve permanent hedges, construct and rebuild stone walls and erect

shelter belts. Other comparable activities which could be encouraged in this way are the restoration of traditional buildings, creation of new footpaths and even rural employment. (An employment subsidy might make more sense than the current capital subsidies.) The use of subsidies in this way is more practical than the use of taxes to control the harmful side-effects of agricultural change and it is one of the elements in Potter's proposals.

The alternative to taxing individuals for actions causing external damage, is to compensate them for the private benefits they foresake if they forego the action. This is an essential aspect of the approach advocated by Potter. What his APAS proposals would involve is the modification of present grant and direct subsidy schemes to make the awarding of grants more dependent upon observation of environmental damage constraints, and to replace certain grant 'rights' with compensation payments; this latter element can be seen either as a payment for undertaking conservation measures or as compensation for not exercising a 'right' to harm the environment. Clearly the proposal to include this element in Potter's policy scheme is consistent with theoretical economic thinking, and should be pursued further. It has the further merit of being aimed specifically at the Agriculture and Horticulture Grant and Development Schemes (AHDS and AHGS), which are aspects of UK agricultural policy, and to the policies for the LFAs over which the UK exercises substantial control.

However, the APAS proposals that farmers should be compensated for any income foregone as a result of not draining wetlands or clearing woodlands makes it appear as if there is acceptance that farmers have the right to investment grants. For it is difficult to imagine extensive drainage or clearance projects taking place without grant-aid. The first-best policy of environmentalists would be to campaign for the abolition of grants, or further restriction of them in certain areas. This would forestal farming entrepreneurs assuming they had a right to grants, and would eliminate the incentive to buy woodland or wetland sites at prices which could only be justified if subsidised modernisation subsequently took place. Certain key habitats would not be threatened by agriculture if grants were not available and the moves taken to limit grants outside LFAs is to be welcomed. However, in some instances time is short, and attempts at the first-best policy may be politically infeasible. In that case it makes sense to pursue alternatives with more chance of success.

With all its virtues, and social benefits[5] (in terms of reduced grant expenditure plus positive action to preserve desired features of the landscape) it is possible to envisage difficulties in administering extensive grant schemes, such as APAS, which incorporate both conventional grant-aid and compensation for not investing. For that reason thought should be given to other ways of limiting the environmental damage caused by current agricultural policies. In his proposals

for the uplands Potter proposes progressive limitations on headage payments to reduce the support for large-scale operations. This, coupled with appropriate factors to adjust for differences in the total size of a farm business, would help impart a small-farm bias to this particular scheme. Similarly, Potter (p.19) suggests tightening the ceilings upon grants under the existing AHDS and AHGS schemes, in order to permit current grant-aid to be diversified to a larger number of smaller projects. This would facilitate the support of more conservationally-oriented measures.

In a different direction conservation groups would be well advised to support wholeheartedly the introduction of quotas on agricultural production, and to encourage them on all products, not just those which are currently in 'surplus'. The adoption of quota policies for milk is already under very active consideration in the EEC, and already applies for sugar. Given the budgetary pressure for CAP reform of this type, and since it will dampen pressures for expanding farm sizes, quotas would help to ease environmental pressures. In arable cultivation, particularly of cereals, an alternative to quotas might be a set-aside programme. Such programmes have been operated in the USA for many years, and involve making payments for the withdrawal of land from production. This is closely related to that component of the APAS proposals involved with compensating farmers for not making improvements, but applies to the pre-existing limits of cultivation, rather than to what they might be. It would therefore have conservational effects generally across cultivated areas and could also help contain the pressure for farm expansion.

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NOTES

1 The word attempting is used advisedly since (a) it is difficult to conceive the removal of all agricultural intervention policies, without also changing other aspects of industrial or trade policy which indirectly affect agriculture, and (b) what should be included in agricultural policies is not always clear — should exemption from rates and VAT be included as Body (1982) suggests?

2 Price intervention policy is not able to prevent the treadmill from operating, for once a budgetary ceiling is reached, policy-supported prices become tied to underlying changes in market-clearing prices.

3 In less-developed countries it might be argued that general lack of awareness of technical opportunities calls for measures which will stimulate wider awareness through input subsidies. These are not arguments for permanent subsidisation, and have little validity in the UK.

4 With a 60% grant the farmer would invest only £400, and with annual additional output valued (with price support) at £40, the farmers private return is 40/400 = 10%. The total cost of the investment is however £1000 and the value of the additional output to society is only £26.7 (the other £13.3 being due to price support). Thus the social rate of return is only 26.7/1000 = 2.7%.

5 In fact Potter probably underestimates the social benefits of supplanting AHGS and AHDS by APASs, since they do not appear to fully take into account the resource savings (of not producing more) or the savings from reduced farm surplus disposal.