

Population Growth, Demographic Change, and Cultural Landscapes

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Introduction

IN A RECENT ESSAY, GREEN (1993:11) DEFINES CULTURAL LANDSCAPES as the product of "spatial and temporal interaction of people with the environment." The work of Woodgate (1992; 1994) has focused on the linkages which connect socio-cultural and ecological sustainability, using the concept of agroecosystems to represent the productive interface between nature and society. As such, it is analogous with Green's definition of landscapes. This coincidence of concepts suggests that the academic disciplines which study these phenomena, namely agroecology and landscape ecology, may benefit from a little cross-fertilization. Therefore, this paper will attempt to bring some of the insights gained from agroecology to bear on the concern for the protection, preservation and management of cultural areas in the context of population growth and demographic change.

From Ecosystems to Cultural Landscapes

Although it is debatable whether or not natural ecosystems are truly cybernetic (Woodgate 1992:52-56), differences between natural and cultural landscapes are "introduced with human manipulation and alteration of the ecosystem" (Gliessman 1990:5) so that cultural landscapes can be considered as ecological systems modified by human beings in order to produce food and fibre products or aesthetic and wildlife values. In cultural landscapes, ecological processes such as competition, herbivory, and predation are overlaid and regulated by management practices such as cultivation, subsidy, control, harvesting, and marketing. Referring to agroecosystems, Conway (1987:96) suggests that "recognisable goals become apparent that are sought through human social and economic co-operation and competition." This gives cultural landscape boundaries a socioeconomic dimension.

The inclusion of both ecological and socioeconomic components within landscapes, and recognition of the complexity of organisation

linking individual elements and sub-systems within more inclusive landscape units, allows us to perceive the hierarchical character of landscape organisation, where each landscape unit forms an element of that at the next level in the hierarchy. The challenge then, is to find a research approach that takes account of this, conceptualising cultural landscapes as the product of interaction between society and nature, both in the past and the present.

Coevolution

One promising body of work that attempts to meet this challenge can be traced back to Richard Norgaard's (1984) paper "Coevolutionary Agricultural Development." Norgaard's work emphasises how people's "activities modify the ecosystem and how the ecosystem's responses provide cause for subsequent individual action and social organisation" (p. 525). Coevolution can be understood as the interactive synthesis of natural and social mechanisms of change (Woodgate 1992:87) that characterise

the relationship between social systems and ecosystems.

Conceptualising nature and society as complex, compound phenomena which are structured into a great variety of overlaid, interactive, arbitrarily delimited systems which coevolve across time and space, provides us with the key to understanding nature/society relationships. From this stand-point it is possible to focus on the idea that specific relationships not only exist between different social classes within specific social systems, but also between the social system and the natural system—what may be termed “socio-environmental relations.”

This perspective highlights how the transition from natural ecosystems to cultural landscapes involves the transfer of certain maintenance and feedback functions from the natural to the social system. Indeed, “the idea that the social system frequently assumes the complementary activities and regulatory functions that were previously endogenous to the ecosystem or maintained by the individual farmer cannot be overstressed” (Norgaard 1984:529). Furthermore, in contrast to the classical view, which frequently attributes the high productivity of modern, capital-intensive economies to technological mastery over nature, the “coevolutionary perspective emphasises not only the increasing task specialisation and organisational complexity of maintaining feedback mechanisms between social actors and the environment” but also “between specialised social actors and the institutions themselves” (Norgaard 1984:530).

As industrialisation and specialisation have progressed, then, not only have socio-environmental relations become more complex, but social relations themselves have become more sophisticated. The increasing complexity of social organisation lengthens the chain of con-

nections between society and nature so that the sustainability of highly industrialised societies becomes dependent not only on the maintenance of society/nature linkages but also on the upkeep of important linkages between individuals and institutions.

Bennett (1985:289) suggests that “[i]f we neglect the influence of humans and their institutions on the environment, rigorous knowledge of the way ecosystems work is of little use.” We can illustrate the importance of this statement by referring to the case of agricultural development, in which we can see that demands for yields to increase exponentially have been met by increasing inputs of off-farm energy. “The rising costs of production however”, says Bennett, “are concealed or charged to other institutional systems” (p. 292). Fossil hydrocarbons consumed in crop production, for example, are often charged to natural energy budgets or passed on to consumers. Thus, while improvements in fertilization, tillage and other agronomic techniques may appear to lower the environmental costs of agricultural production by maintaining soil and water productivity, they may in fact lead to increased environmental costs in some other sphere at some other time, such as the provision of clean drinking water in the future, for example.

What is perhaps even more important, but certainly less well understood, is that institutions and mechanisms, such as the market, often result in the negative impacts of production being transferred from one region to another. In other words, there are often spatial (as well as temporal) disjunctures between the causes and effects of environmental degradation. We shall return to this point in the next section of this paper where we examine the relationship between demographic factors and environmental change.

Population, Consumption, and Environmental Change

The relationship between population, consumption, and environmental change is increasingly recognised as a complex and ideologically polarised area of debate. This became apparent during the U.N. Conference on Environment and Development [UNCED, the "Earth Summit"] process where the South refused to accept discussion of population growth without it being linked to action on poverty alleviation, food security, and a reduction in levels of resource consumption in the North. For, notwithstanding the projected figures from U.N. sources that 90% of the expected 4.7 billion people that will be added to world population by 2050 will be born in the South, it is the industrialised countries that currently present the biggest threat to global environmental resources. Despite supporting only 24% of global population, the industrialised countries "consume 85 per cent of the world's metals, 92 per cent of its cars, 85 per cent of its chemicals, 81 per cent of its paper, 78 per cent of sawn wood, 72 per cent of milk and 48 per cent of cereals. They also consume 82 per cent of gasoline, 72 per cent of diesel, 85 per cent of gas and 82 per cent of electricity" (Parikh 1992).

Although it is necessary to take heed of global demographic dynamics, we do not intend to rehearse here the main historical-demographic trends and trajectories that characterise the major world regions (the topic is addressed, however, by Demeny (1990) amongst others). Rather, the purpose of this part of our paper is to explore some of the underlying features and dynamics of population change, relating these to aspects of wealth and poverty, and to questions of land-use and, thus, landscape change. Nevertheless, it is important to emphasise that the current, marked national diversity in demographic indicators is unparal-

leled in human history. Examples of such diversity include: natural growth rates of countries ranging from +4% to -0.2%; average family size from more than 8 to around 1.4; age structures that encompass the very youthful (half the population under 15 years) to the aged (less than 20% under 15); and levels of urbanization that range from 10% to 90% of total national populations. Given this extraordinary national diversity in demographic indicators—which are influenced by the complex interaction of environmental factors, economic activity, historical processes, social structures, and cultural traditions—we immediately become aware of an enormous variety of socio-environmental relationships.

A fresh conceptual approach to understanding the linkages between population and environment first requires that we address the issue of "carrying capacity" which, in our view, is problematic as it is entirely conditional on factors such as social structure, level of technology, and the consistency of climatic factors. Blaikie and Brookfield (1987) propose the concept "population pressure on resources" (PPR), which helpfully establishes a linkage without the need to specify critical thresholds embedded in the term "carrying capacity."

A second issue which deserves attention concerns the distinction between intensification and innovation. Intensification indicates increased output through the elimination of fallow and the use of inputs (capital and/or labour) per unit area. Innovation, on the other hand, embodies the qualitatively new ways in which the various factors of production are employed.

While intensification and innovation are certainly not mutually exclusive, where intensive systems are based on cheap and available labour, this may indeed inhibit innovation. Nevertheless, such labour-intensive production systems are

also able to contain the consequences of high levels of population pressure on resources, notably through the construction and maintenance of terracing and other forms of landesque capital. If labour is withdrawn from the maintenance of such systems, however, the consequences can be disastrous (Blaikie and Brookfield 1987, Woodgate 1994).

Clearly then, landscape degradation is not an inevitable outcome of population pressure on resources. Indeed many of the cultural landscapes that we cherish so deeply may have developed as a result of it, while their degradation and disappearance may, in fact, be a result of land abandonment. As Blaikie and Brookfield (1987:34) put it "degradation can occur under rising PPR, under declining PPR, and without PPR."

In common with many other treatments of the population/environment dynamic, the work of Blaikie and Brookfield focuses on resources use, treating the environment as a "supply depot." From this perspective, if we treat population as an independent variable, there are three general ways in which population growth can impact on the environment:

1. Population growth results in the expansion of the area under cultivation. Where the cultivated area expands into different ecological zones, in the absence of institutional and technological change, this may lead to inappropriate use of resources and, ultimately, environmental degradation.
2. Population growth results in the intensification of production, involving increasing investments of human, natural, and financial capital, and in innovation embodying the development of new technical means of production. While this technologically optimistic scenario represents

the evolution of ever-more sophisticated land-management systems, non-sustainable outcomes may appear in the medium-to-longer term (e.g., groundwater pollution, declining soil fertility).

3. Population growth is neutral in terms of its impact on the local resource base, either through the importation of food from elsewhere (as in urban areas) or as excess population outmigrates from rural areas, resulting in no demographic pressures for local land-use change (Sage 1994:40).

While the third point may be true at the local level, the coevolutionary framework outlined above alerts us to the fact that the absence of local landscape change does not exclude the possibility of changes elsewhere: food imports are produced somewhere, and excess population must be accommodated somewhere. These are the spatial disjunctures to which we referred earlier. In addition, the coevolutionary perspective sensitises us to the notion that there may also be reverse effects of population growth through negative feedback loops, where changes in the productive potential of the environment, resulting from PPR, influence the determinants of population: fertility, mortality, and migration.

Although population dynamics clearly influence landscape changes then, they do so in association with at least two other socioeconomic variables: technological capacity and levels of consumption. Thus, in any given landscape, environmental impact (I) results from the interaction of at least three variables, population (P), per-capita consumption or affluence (A), and technology (T). This creates a useful shorthand expression, $I=PAT$, which is now widely used in the literature. Its appeal may stem from the way it diffuses the singular re-

spontaneity of population, enabling it to be applied equally in the industrialised countries of the North and the largely rural economies of the South. A critic of inappropriate technology such as Barry Commoner has used a variant of the I=PAT expression to calculate the total environmental impact of industrial pollution and to argue that it is primarily the technological factor rather than population which needs to be controlled (Commoner 1972). Yet, in much of the policy literature, one still detects more enthusiasm to isolate population as a factor for attention than to address either consumption and technology or uses of the environment other than its "supply depot" function. For example, "for any given type of technology, for any given level of consumption or waste, for any given level of poverty or inequality, the more people there are, the greater is the impact on the environment" (UNFPA 1990:10).

While this is strictly correct, it hardly seems fair or meaningful to hold all factors other than population constant. This point is made even more forcefully if we widen our consideration of human use of the environment beyond its function as a "supply depot" and incorporate its role as a 'waste repository' and "living space": that is, if we look at what we add to the environment and how we change its appearance, as well as being concerned with what we take from it (Catton and Dunlap 1989, Redclift and Woodgate 1993).

In the context of the North, this extended focus makes it clear that changes in the factors of consumption (A) and technology (T) are likely to be more important than population levels *per se*. Research conducted by Ehrlich and Ehrlich (1990) supports this notion. Employing per capita use of commercial energy as a proxy measure for affluence and technology, they calculate that each baby born in the United States has an impact on the

Earth's ecosystems three times that of one born in Italy, 13 times one born in Brazil, 35 times one in India, 140 times one in Bangladesh and 280 times one born in Chad, Rwanda, Haiti or Nepal.

By extending the scope of our model to incorporate the ways we add to and refashion the environment, we can also see that, in the largely industrial economies of the North, landscape change may derive from qualitative changes in our use of the local environment as well as quantitative increases in consumption. Examples might include the constant need to identify new landfill sites for the disposal of waste; the continuously increasing aspirations for personal mobility which involve road-building schemes; the ongoing suburbanisation of the countryside; and leisure interests, most spectacularly illustrated during recent years by the conversion of farm and other land into golf courses (Pleumarom 1992).

Rising per capita income, as part of a process of economic development, is a major variable of landscape change, as we have seen in relation to the I=PAT formula. Yet the impact of rising income will vary as a function of base levels of income and patterns of income distribution. This relationship is manifest in differences between the North and the South. In the North, where base levels of income are already relatively high, the income elasticity for food is low and approaching zero, whereas it is high and positive for goods and services such as housing and recreation (Pierce 1990). In the South, by contrast, average incomes are much lower, so that a rise initially stimulates relatively large increases in demand for basic food goods, although as incomes continue to rise and basic needs are met, the composition of demand is likely to change accordingly (Crosson 1986). Thus, traditional grains and tubers gradually give way to higher-protein diets and acquired

dietary tastes, such as livestock products, imported cereals, and processed foods. Consequently, it is through the changing effective demand for food that rising levels of income exert different pressures on landscapes.

The work of Billsborrow and Geores (1990) reflects these differences between North and South. After suggesting that the two main factors responsible for increasing environmental degradation are increasing per capita incomes in the North and increasing populations in the South, they clarify their statement by saying:

[W]ith per capita incomes in low-income countries one-tenth those of developed countries, even with four-fifths of the population residing in low-income countries the bulk of the growth in effective demand upon resources in low-income countries in recent decades is attributable to *increases in the high levels of consumption of developed countries* (Billsborrow and Geores 1990:35, emphasis added).

This argument is underpinned by the Ehrlichs, who make reference to the Netherlands in developing their case about worldwide overpopulation. They argue that the Netherlands can support a population density of 1,031 people per square mile, "only because the rest of the world does not. In 1984-86, the Netherlands imported almost 4 million tons of cereals, 130,000 tons of oils, and 480,000 tons of pulses. It took some of these relatively inexpensive imports and used them to boost their production of expensive exports—330,000 tons of milk and 1.2 million tons of meat" (Ehrlich and Ehrlich 1990:39).

The relationship between rich and poor countries, as between classes within countries, is determined, ultimately, by superior economic power expressed in the mar-

ket place which provides the necessary signals and incentives to the sphere of production. Supported by structural economic reforms to remove "distortions," the market has heralded a growing trend in many developing countries where basic food staples and valued cultural landscapes have given way to export crop and feed-grain production, often resulting in increasing environmental degradation.

The complexity of the linkages between demographic and landscape change demonstrates the vital importance of examining trends in the different categories of land use (which are fraught with definitional and measurement difficulties) and how these might correlate with demographic and economic indicators. Yet an exercise in complex data analysis should not preclude attention to other variables that mediate between population and the environment: technology most certainly, but also the socio-political structure of societies and the various cultural traditions that characterise different ethnic groups.

In the following section of this article, the framework and understanding developed in the preceding sections will be used in an analysis of landscape change in Britain, tracing the coevolution of society and environment from the end of the feudal era. In order to contrast this process comparisons will be made with continental Europe.

The Coevolution of Cultural Landscapes in Britain & Europe

The importance of the coevolutionary perspective to the task of preserving and managing cultural landscapes is at least two-fold. Firstly it provides an integrated socio-environmental analysis of why and where landscapes might be changing. Secondly, it forces us to confront some of the moral issues that our mission entails. We shall return to these ethical questions in our final discussion. Before that, let

us look at the example of cultural landscape change in Britain.

The work of Pretty (1990) attests to the high innate sustainability of feudal agriculture in Britain, suggesting that it was promoted by the "integrated nature of farming, the great diversity of produce, including wild resources, the diversity of livelihood strategies, the guaranteed source of labour, and the high degree of cooperation" (p. 1). Nevertheless, the classic unenclosed, strip-cultivated, three-field system of manorial agriculture did decline in Britain, and eventually disappeared as a result of the agricultural restructuring brought about by the Parliamentary Enclosures (c. 1750-1850) to be replaced by a fully fledged capitalist agriculture by the middle of the nineteenth century.

The rationalising of land into viable holdings in Britain involved much displacement of labour, leaving discrete farm units and fewer farmers, giving rise to the distinctive pattern of small fields enclosed by hedgerows and stone walls that today we cherish so highly and regard as basic units of "traditional" lowland farming landscapes. The nature of these landscapes (the products of socio-environmental relations which no longer pertain) makes them very difficult to preserve. As we have already noted, economic growth which increases production and prosperity is not evenly distributed, and often seems to be linked to landscape change and social deprivation in rural communities. Despite the fact that the countryside accounts for by far the greater part of the land area and a substantial part of the population in European countries (80% of the land and over half of the population in the European Union (EU) as a whole), policy measures to address these issues have only recently begun to be developed. This is largely because the rural economy and countryside amenities have been seen as indissoluble from the prac-

tice of farming, indeed virtually as incidental by-products of agriculture. Rural policy has thus been essentially agricultural policy. In Britain this identity has been challenged over the last two decades and a rural policy independent of agriculture is now emerging. In other parts of Europe ties to agriculture are still very strong and they continue to dominate EU thinking and policy. To comprehend these different viewpoints more clearly we need to understand differences between the coevolutionary pathway that has unrolled in Britain and that which has transpired of much of mainland Europe.

With the repeal of the Corn Laws (1846), which had provided protection against cheap imports, British agriculture was alone in Europe in its exposure to the rigours of competition in an expanding world market. Initially, however, the landed classes were able to capitalise on the country's position at the forefront of the Industrial Revolution and, during the third quarter of the nineteenth century, British agriculture rose to a peak of activity, receiving large-scale investment and employing its highest-ever number of labourers. The nature of agricultural production was changing as a result of the new industrial inputs and advances in engineering techniques. High yields were being obtained through the use of fertilisers, improved livestock feeds, drainage, mechanisation, and investment in infrastructural capital. High-input farming was high-profit farming, and for a while at least everyone seemed to prosper.

The term "high farming" also denoted high status. During the mid-Victorian period it was still essential for a nobleman to be a landowner. Land possessed a symbolic importance far beyond its economic or political significance. National heroes who had been born commoners had to be provided with suitable estates if they were to be el-

evated to the peerage, such was the case with Nelson, Wellington, and Disraeli. Similarly, those who had made their fortunes in commerce and industry also searched for country seats to set the seal upon their aristocratic aspirations.

As industry and agriculture boomed, the nature and structure of village life was changing. The countryside was becoming "ruralised." The new systems of factory production were able to produce commodities which rendered much of the village-based, small-scale manufacture and craftwork obsolete. Many of what are now regarded as the best examples of traditional English villages were in fact medieval textile towns, which reverted to an agricultural status following the transfer of textile production to the North during the Industrial Revolution.

Even those villagers who did not work directly on the land were employed in ancillary trades such as milling, blacksmithing, and cartwrights' workshops. Because of this dependence on agriculture the village was becoming what we might call an "occupational community," whose whole existence was based on the fortunes of the farming industry. Today this occupational community is regarded as traditional, but in the mid-nineteenth century it was novel. Villagers then looked back to the more economically diverse communities which had existed prior to the enclosures and the onset of full commercialisation.

From 1875 until 1939, except for the period of the First World War, British agriculture fell into a chronic depression, characterised by falling product prices, reducing rents, increasing bankruptcies, and an unkempt countryside. The change from the prosperity of high farming was an abrupt one. The 1870s mark a turning point in English rural history, when the implications of the Industrial Revolution and the expansion of international trade be-

came clear. It was a period in which farming ceased to be one of the country's major industries or even a major source of the nation's food supply.

Although other newly industrialising European countries sought to counter the effects of free trade with the imposition of import tariffs, England remained true to the principles of free trade. By 1851 the newly emerging industrial towns and cities had already attracted vast numbers of working people out of the countryside, making Britain the first nation to have the majority of its people residing in urban areas. To the country's urban majority, free trade meant cheap food and successive proposals for tariff reform consistently failed to win electoral support. Only during the First World War were the principles of *laissez-faire* set aside. During the rest of the period from 1846 until the Second World War, agriculture became secondary to industry, which required cheap food in order to keep down the cost of labour. If this resulted in agricultural decline, it was regarded as small price to pay for benefits promised by industrial growth.

With the decline in agricultural prosperity and the acceleration of industrial growth and development, the role of rural areas began to change and new socio-environmental relationships coevolved. Deprived of its productive importance, the countryside became more and more of an amenity, something to be appreciated and consumed. The period of agricultural decline saw the establishment of institutions such as the National Trust in 1895 and the Council for the Protection of Rural England (CPRE) in 1926.

Although the 1930s was a decade of depression, the social effects were by no means evenly distributed. Unemployment was concentrated in the highly industrialised areas of the North and West, but the South-east continued to grow, based largely on

the expansion of consumer goods manufacture. Among the goods that the relatively affluent employees of such industries began to consume was the countryside.

With increasing car ownership and housing development in the suburbs, the countryside became more accessible. Through the experience of their consumption of the countryside, the urbanites constructed a rural England almost completely at odds with the realities of the time. Appreciative of the aesthetics of rural landscape, the history of rural tradition, and the value of the natural environment, they were almost completely ignorant about agriculture and the economic basis of rural life.

The construction of the rural idyll and its increasing consumption brought with it problems, however. By the 1930s a recognisable preservation lobby had emerged and was pressing for constraints to be placed on the destruction of the rural arcadia. Bodies including the CPRE and individuals such as Patrick Abercrombie were pressing for the designation of National Parks, Green Belts, and a generalised system of Town and Country Planning. On the other side of the equation were those who were pressing for greater access. The Ramblers Association, founded in 1932, launched a campaign to open up the hills and moors of the North and West to public access. Matters were brought to a head in April 1932 with the mass trespass of Kinder Scout, one of the Duke of Devonshire's grouse moors, which eventually resulted in the passing of the Access to the Mountains Act of 1938.

Nevertheless, on the eve of World War II, thousands of hectares of arable land lay abandoned, agricultural bankruptcies were commonplace, thousands of farm workers were unemployed or underpaid, and rural communities had been sapped of their cultural vitality, presenting a very different picture from

the still largely peasant-based agriculture of France. Between 1939 and 1945 much of this was transformed however.

One major factor can be identified as accountable for this transformation: state intervention, intervention which clearly transferred a great deal of decision-making power from the farmer to state agencies, thereby lengthening the chain of connections between society and nature. As external trade was once again threatened by the resumption of submarine warfare, farmers were offered an incentive to increase production through the medium of guaranteed prices.

The agencies responsible for translating policy into action were the county-based War Agricultural Executive Committees. They offered advice, issued cultivation orders for parcels of land, and allocated resources such as fertilisers, feedstuffs, and machinery. Cropping programmes were administered by distributing production quotas throughout their local areas. Their activities thus defined in precise detail the crop mix and husbandry techniques to be employed on virtually every piece of farmland in the country.

This intervention and loss of autonomous decision-making power was accepted by the farmers and landowners, principally because the same committees were also responsible for administering the subsidies and grant aid needed for investing in items of capital. The War Agricultural Executive Committees thus provided a model for state intervention which was maintained and built upon in the post-war period. Until 1979, the governments which followed were determined not to let agriculture slip back into the depressed conditions which had prevailed for over half a century prior to the 1940s.

As a result of the strategic status granted to agriculture, agricultural policy was allowed to become en-

tirely single-minded in its aims: the production of ever-increasing quantities of cheap food. In terms of the environment's supply depot function, the results were spectacular: yields increased by 300% over the next forty years and by 1983 Britain had become virtually self-sufficient in temperate foodstuffs.

The results of this policy direction can be seen not only in the economic status and prosperity of agriculture, but also in the social and ecological changes which have occurred in rural areas. The replacement of horses and people by tractors and combined harvesters has led to the loss of nearly two-thirds of the agricultural labour force over the years since 1945. The need to realise the potential economies of scale offered by mechanisation has resulted in a wholesale loss of woodlands, hedgerows, and small ponds. The introduction of increasingly toxic agricultural chemicals has compounded this loss of habitat and led to the near-extinction of numerous species of fauna and flora. The state regulation of agriculture has profoundly altered both the structure of the farming industry, the traditional character of life and work in the countryside, and, in the process, transformed the physical appearance and ecological status of the land.

Despite their small numbers (today less than 1% of the population), British farmers have exercised extraordinary control over agricultural/rural policy in the post-War period. However, since 1980, the revelation of agricultural over-production and the huge subsidies being paid by taxpayers and consumers, in what was supposedly a cheap food policy, has seriously weakened the political power of the farming community in Britain. Nevertheless, under the EU Common Agricultural Policy (CAP) British farmers have been protected (by the political power of their Eu-

ropean, particularly French, colleagues) from the swinging cuts that have been the fate of other industries in overcapacity. In France, as in other parts of mainland Europe where agriculture remained ostensibly peasant-based until the post-War era, small farmers and traditional farming are seen as a vital part of the country's cultural heritage to be strongly protected—if necessary at considerable cost. This was a key factor behind the French intransigence which almost led to the breakdown of the 1994 GATT negotiations. Similar attitudes have also shaped the CAP, where maintaining farm livelihoods is a major concern, and EU rural policy, which sees the family farm as its very basis.

A European agriculture modelled on the USA with large reserves of land and few farmers has been rejected within the EU in favour of a farm-survival policy. The means for achieving this are farm diversification through support for: environmentally friendly farming systems, forestry, and tourism; the clustering of rural services and infrastructure into key villages; and integrated rural development programmes. Although these policies have met with some success in Britain, with more than 50% of European farmers aged over 55 and almost half of these lacking a successor, a continuing decline in the number of farmers seems inevitable.

In contrast to declining agricultural populations, aggregate rural populations are more buoyant as townspeople migrate to the countryside in search of their vision of a rural arcadia. Some take up part-time farming and aim to manage their holdings in environmentally friendly ways, but such people are newcomers who often contribute little to the maintenance of local culture, services, or infrastructure. Furthermore, by inflating house prices and using private transport to distant towns for shopping, schools, and other services, contributing to clo-

sure of local shops and schools, they may actively lower the living standards of less-wealthy local residents. In seeking to protect their chosen portion of rural Britain the "NIMBY" (Not in My Backyard) environmentalism of newcomers may also prevent the development of new job opportunities for locals displaced from agriculture. Thus, the identity of the environmental and social objectives of the farm-survival policy is questionable, as the new stimulation of farm diversification and development scattered into the very heart of the countryside raises fundamental questions of both its desirability and the ability of the planning system to cope with it.

Fears about farm diversification pale into insignificance, however, when compared to concern over land abandonment. The spectre of scrub and dereliction is seen as the alternative if agriculture-based livelihoods are not maintained. Even the weedy fields of short-term set-aside are an embarrassment to farmers grown used to the sterile, manicured countryside of intensive farm systems. The large scale withdrawal from agriculture which has occurred in countries like France is anathema to most mainland Europeans, while in Britain such migration is little more than a distant "folk memory."

In the mountain and Mediterranean regions where land abandonment has mostly taken place, substantial environmental problems can ensue. The growth of rank grass and scrub following the cessation of grazing in the mountains can lead to a greater incidence of avalanches and interfere with skiing. In arid Mediterranean climates the build up of biomass consequent to the succession from grass to scrub greatly increases the risk of devastating fires. The reasons for maintaining farm structures in mainland Europe thus seems incontrovertible, whether they can be maintained or

even need to be maintained everywhere, however, bears some consideration.

Coevolution and the Preservation of Cultural Landscapes in a Global Context

In this final section we shall try to pull together some of the strands of thought that have been developed throughout this article. Cultural landscapes have been characterised as the product of coevolution between nature and society, and it was noted that the linkages between nature and society have become more complex as industrialisation has progressed. In reviewing the likely impacts of population growth and demographic change on landscapes, we suggested that the relationship between population dynamics and landscape change is:

- Conditioned by additional socioeconomic factors such as affluence and technology;
- Often characterised by disjunctions between cause and effect in both space and time;
- Only intelligible if we take account of our use of the environment as a waste repository and living space, as well as a supply depot.

By tracing the coevolution of nature and society in Britain and making comparisons with mainland Europe, we were able to see how distinctly different agroecosystems and landscapes have developed. With Britain's accession to the European Union, however, which introduced British agriculture to the influence of the Common Agricultural Policy, we have also recorded the subjection of British landscapes to the influence of policies designed to provide for the maintenance of an agricultural structure which has long since been transformed in Britain. Continental European and British perceptions of landscape and rural society are different and thus likely

to require different measures to ensure their survival. In searching for practical ways to address this situation we can draw on the participatory appraisal techniques that have been developed for the practice of agroecology (e.g., IIED/MYRADA 1992).

The process of coevolution between nature and society as it has unfolded in Britain is represented in diagrammatic form in Figure 1. What the diagram suggests is that, as industrialisation has progressed, society has taken on more and more of the maintenance and feedback functions that were previously either endogenous to ecosystems or carried out by individuals. Today, the burden of sustaining the food system depends on society rather than nature. In considering the coevolution of society and nature in Britain, we saw how agriculture initially incorporated industrial inputs into its production systems during the third quarter of the nineteenth century but was unable, in the long run, to compete with cheap imports from the colonies, going into decline until the Second World War. It was during this period, however, that demand for environmental goods other than food and fibre began to grow quickly and conflicts between the functions of supply depot, waste repository, and living space became evident. With the advent of war, Britain's lack of food self-sufficiency triggered state intervention with productivist policies which remained in force until the beginning of the 1980s and led to the development of what are termed high-external-input industrial-agricultural systems (see Figure 1).

The consequences of the productivist policies had become obvious by the end of the 1970s, demonstrated by the degradation of landscapes and ecosystems and the rapid decline of the agricultural population. The degradation of environment is explained in Figure 1 by referring to the appropriation, substi-

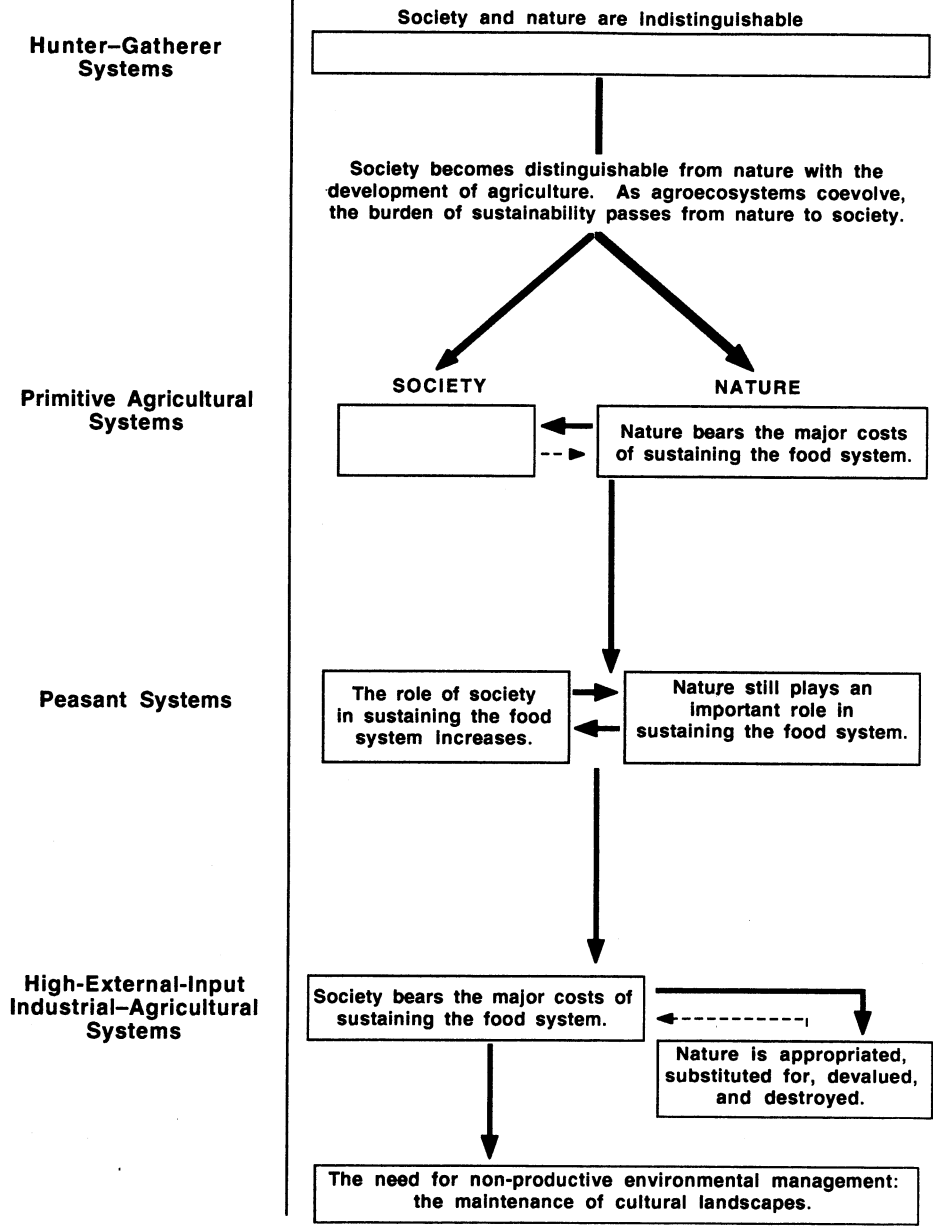
tution and subsequent devaluation of nature. This refers to the process whereby crop species and ecological processes are abstracted from nature, taken into the laboratory, transformed by science, and then substituted for by the products of science (hybrid varieties, pesticides and fertilizers, and mechanical technologies). As a result, the original species and processes are devalued and, as with all things that are devalued, they are eventually destroyed. This destruction of nature is clearly linked to the destruction of local culture, a process which is unquestionably evident in much of the South today.

It is the visible destruction of cultural landscapes (which have their origins in socio-environmental relationships that are long since past), that prompts the need for non-productive environmental management, for only the material products of landscapes are valued in the marketplace. Although our quest to preserve these relicts of bygone times may stem from a desire to protect nature and maintain links with our rural heritage, notice should be taken of the problems that have been associated with attempts to maintain rural livelihoods that encompass socio-environmental relations that are an anachronism in the context of an ever-expanding global economy (Woodgate 1992).

More importantly, however, if our brief excursion into coevolutionary theory has highlighted one central problem, it is this: any attempts to preserve cultural landscapes "here and now" are likely to have implications for other landscapes somewhere else or at some other time. Thus, it is particularly important to ask ourselves what these implications are, or are likely to be in the future. As members of high-consumption societies, which depend upon imports of vast quantities of commodities from low-consumption societies, we need to face up to the question of whether or not

Figure 1. Coevolution between nature and society

TYPE OF SYSTEM



Source: adapted from Redclift and Woodgate 1993

our ability to preserve cultural landscapes here and now is bought at the expense of landscapes elsewhere, particularly those of the South. Is there not a contradiction between our attitudes and behaviour

when we condemn the devastation of the Brazilian Amazon, for example, while at the same time we are designating National Parks in our own backyards?

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