PERGAMON

Land Use Policy 17 (2000) 279–294

Land Use Policy

www.elsevier.com/locate/landusepol

Natural Areas, the whole countryside approach and sustainable agriculture

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Received 20 January 2000; received in revised form 9 May 2000; accepted 13 June 2000

Abstract

Natural Areas are biogeographical zones which reflect the geological foundation, the natural systems and processes, and the wildlife in different parts of England, and provide a framework for setting objectives for nature conservation. This paper argues, with particular reference to agro-ecosystems, that there is a need for an integrated, whole countryside approach to Natural Areas based on the principles of 'strong' sustainable development. In practice, this means the delineation of conservation objectives for the *whole* of each Natural Area and the application of policy instruments designed to address the *causes* of environmental loss and deterioration. The latter requires, it is argued, a structural analysis of generic environmental issues. A generic issues approach is required in order to avoid the pitfalls of environmental 'symptom management' (environmental managerialism), an approach which dominates current environmental and agri-environmental policy. Necessary as such discrete action programmes and measures may be as short-term 'fire-fighting' responses to immediate threats, environmental managerialism as a policy framework epitomises a non-holistic and 'disintegrated' approach to nature conservation. The paper goes on to discuss the configuration of agri-environmental policy that will be required to address generic agricultural impacts on biodiversity and the constraints and opportunities for its implementation that are likely to arise within the context of further CAP reform and the forthcoming round of WTO negotiations.

Keywords: Natural Areas; Whole countryside approach; Biodiversity; Sustainable agriculture; Common Agricultural Policy

Introduction

English Nature (EN) has been developing the concept of Natural Areas since 1993. Natural Areas are biogeographical zones which reflect the geological foundation, the natural systems and processes, and the wildlife in different parts of England, and provide a framework for setting objectives for nature conservation.[1] The ideal Natural Area should be a discrete geographical area, encapsulating unique features, be easily recognisable by and be acceptable to the relevant organisations and communities for whom it should generate a feeling of identity (Hewston and Cooke, 1996; Tilzey, 1997a). A Natural Area thus combines natural and cultural characteristics. Indeed, the great majority of its characteristic features is irreducibly semi-natural in character, being the outcome of long periods of human action on a pre-given, but co-evolving, ecological resource.

EN has produced 'profiles' for each Natural Area which describe the key nature conservation features (KNCFs), identify the key issues affecting these and set objectives (Cooke, 1996, Tilzey, 1997a). The UK Biodiversity Action Plan (BAP) which sets targets for species and habitats will be delivered through the Natural Areas approach. Although they are not formal designations Natural Areas are now recognised in Government Planning and Policy Guidance and other statutory advice. EN believes that Natural Areas 'can begin to provide a platform for progress and a means to establish partnerships to plan for the protection and management of biodiversity and geological assets' (English Nature, 1999a, p. 4).

The development of the Natural Areas approach can be seen as part of a sea change in attitudes to nature conservation and environmental management more

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[1] The use of the Natural Area concept in this paper is *not* intended to imply that this is *the* definitive framework for a whole countryside approach. The Natural Area concept has been developed, of course, through reference to, and synthesis of, pre-existing definitions of small homogeneous areas on the basis of a variety of natural/cultural criteria. Rather, the use of the Natural Area concept here is intended only to demonstrate how it might be developed as an exemplar of a whole countryside approach, one that has nature conservation, and particularly biodiversity, as its primary focus.

0264-8377/00/$ - see front matter
PII: S0264-8377(00)00032-6

generally. It is now increasingly realised that 'special sites' cannot retain their interest independently of the changes that take place in the surrounding countryside. Organisations such as EN appreciate that they must now seek to influence land use beyond the boundaries of Sites of Special Scientific Interest (SSSIs) in order to return poorly managed habitats to optimal condition, restore lost habitats and create new ones. Unfortunately, agricultural policy and practice, the central concerns of this paper, whilst essential for the continued well-being of farmed habitats, in their present form remain key factors in the continuing loss and decline of such habitats and their associated species, particularly in the wider countryside. By the same token, the removal of current agricultural policy constraints and the adoption of positive measures will be key to achieving the majority of Natural Area objectives where these relate to agro-ecosystems.

This paper will argue that the adoption of a whole countryside approach requires, firstly, the delineation of conservation objectives for the *whole* of each Natural Area; secondly, the identification of the structural *causes* of environmental loss and deterioration; and thirdly, the adoption of policy instruments that *address* these causes rather than seeking primarily, as at present, to mitigate them.

Agriculture and Natural Areas

It is perhaps appropriate to recall at this point that a large proportion of the most valued habitats and landscapes in England, as in Europe as a whole, has arisen from agricultural management of the natural environment over a very long period (Meeus et al., 1990). Much of the biodiversity resource of Natural Areas — in effect many of their key characteristics — depends for its survival upon the continuation of low-intensity, mixed or organic farming systems and practices (McCracken et al., 1995; Pain and Pienkowski, 1997). The latter have moulded, in co-evolutionary fashion, the very character of Natural Areas.

This co-evolutionary relationship between farming and the natural environment has undergone, of course, a profound transformation during the present century and particularly since the Second World War. The co-evolutionary relationship has become progressively attenuated as agriculture has become subject to the twin processes of 'appropriationism' and 'substitutionism' (Goodman et al., 1987)[2]. The last three or four decades in particular have witnessed steep declines in the area of semi-natural habitat and in the numbers and range of farmland species characteristic of both the former and more traditionally managed 'artificial' habitats (see, for example, Mitchell, 1996). Far from sustaining the biodiversity and landscape resource as before, agriculture has now become a central factor in its loss and decline. Consequently, many of the features that make Natural Areas distinct are being eroded. Where they survive it is now often *despite* agricultural practices, rather than *as a result* of them. The stock of 'natural capital' which previous generations built up and nurtured is now being managed unsustainably, subject to outright destruction or, perhaps more commonly, to a slower process of degradation (Tilzey, 1997a).

This massive acceleration in the rate of biodiversity loss and decline can be attributed structurally to the impacts of a particular phase or model of capitalist development which may be termed 'developmentalism' (McMichael, 1996a; Tilzey, 1995). As applied to the agriculture sector, we may refer to this phase or model as 'productivism' (sometimes referred to as 'productionism'), a state managed policy framework to which an acceleration of the processes of appropriationism and substitutionism are central. Productivism, embodied in UK post-war policy and subsequently in the Common Agricultural Policy (CAP), has been implemented by employing the economic instruments of guaranteed prices, state (or European Union (EU)) regulation of major commodity markets and their insulation from foreign competition. The state (or EU) has supplemented such policies by embarking on modernisation programmes involving investment grants, input subsidies, special credit and fiscal incentives, public agricultural research and its dissemination by extension services. The result was the establishment of a policy framework in which higher net farm income could be secured effectively only by means of innovation and productivity growth. This acted additionally as an incentive to cut costs through releasing labour/enlarging holdings and to borrow money for land purchase and capital projects (Goodman and Redclift, 1991; Marsden et al., 1993; Lowe et al., 1994). The environmental impacts of such productivist policies can be enumerated as a series of generic issues, as follows:

- loss and fragmentation of semi-natural 'infield' habitats through agricultural improvement or arablisation;
- abandonment or undermanagement of extant semi-natural 'infield' habitats (mainly in the lowlands);
- overgrazing of semi-natural habitats (mainly in the uplands);
- loss or mismanagement of 'interstitial' habitats (e.g. hedgerows, field margins, ditches, etc.);
- drainage or drying out of wetland habitats due to water over-abstraction;

[2] *Appropriationism* refers to the discontinuous but persistent undermining of discrete elements of the agricultural production process, their transformation into industrial activities, and their re-incorporation into agriculture as inputs, e.g. the horse by the tractor, manure by synthetic fertilisers; *substitutionism* refers to a similarly discontinuous but persistent process to achieve the industrial production of food in which not only does industrial activity account for a steadily rising proportion of the value added but the agricultural product, after first being reduced to an industrial input, increasingly suffers displacement by non-agricultural components

- pollution and eutrophication of surface and groundwaters leading to loss or degradation of aquatic ecosystems;
- loss of crop rotations and arable-pasture mosaics leading to severe reduction in characteristic farmland species;
- shift from spring-sown to autumn-sown cereals leading to loss of winter stubbles and to loss of suitable nesting sites for characteristic bird species;
- universal application of pesticides leading to loss of arable weed species, invertebrates and thereby food sources for other wildlife groups;
- universal application of artificial fertiliser leading inter alia to the loss or degradation of characteristic hedgerow and field margin vegetation.

Whilst causality is without doubt a complex issue, these generic issues, nonetheless, can be linked causally to the essential features of the policy framework described above. We can refer to this relationship as *structural causality*.[3]

As a consequence of these generic impacts of productivism, semi-natural 'infield' habitats have been pushed to the margins of agro-chemically based agriculture, subsisting as a residual resource peripheral to most farming systems. Only in the uplands, where physical constraints have prohibited the widespread application of pesticides and artificial fertilisers, do semi-natural habitats still comprise an integral element of farming systems (Bignal and McCracken, 1993). In much of the lowlands, however, semi-natural 'infield' habitats survive typically as fragments within an otherwise ecologically impoverished farming landscape. Even 'common' species characteristic of more productive farmland (that is, traditionally farmed 'artificial' infield habitats) have exhibited alarming declines over the last two to three decades (Pain and Pienkowski, 1997). Freshwater habitats continue to suffer loss and decline through nutrient pollution and water abstraction from agro-chemically based farming practices (English Nature, 1997). In the uplands, habitat deterioration rather than outright loss has been the norm, the result most frequently of ecological overgrazing by livestock (Bignal and McCracken, 1996; English Nature, 1996).

The present agricultural and environmental policy framework affords a proportion of this residual resource (primarily semi-natural 'infield' habitats) a modicum of legal protection and/or conservation management by means of regulation (principally the Wildlife and Countryside Act, 1981) and/or environmental land management schemes (ELMS). Of the latter, the two main schemes in England, Environmentally Sensitive Areas (ESAs) and Countryside Stewardship (CS) (introduced since the late 1980s and now included in Regulation 2078 of the CAP) target, respectively, large areas of land of particular heritage value and defined habitats, landscapes and other features in the wider countryside. Their main focus has been upon grazed rather than arable land, reflecting the greatest priority attached hitherto to the conservation of semi-natural pastoral habitats (English Nature, 1996; Tilzey, 1997b). Unfortunately, it remains the case that the majority of the biodiversity resource of Natural Areas, particularly that characteristic of 'interstitial' and 'artificial' infield habitats, remains without adequate safeguard. Most wildlife habitats and characteristic species in the wider countryside continue to decline in extent, quality and numbers (English Nature, 1997). Moreover, it is difficult or impossible for those sites in receipt of legal protection or ELMS to retain their biodiversity interest over the longer term independently of the adverse changes taking place in the surrounding countryside. Consequently, there is now an urgent need, firstly, to enhance the remaining resource of semi-natural habitats through site buffering, linkage and re-creation and, secondly, to address the decline in 'common' habitats and species in the wider countryside. The Natural Areas programme, and similar whole countryside/landscape ecological perspectives, provide a conceptual framework within which English Nature and others can carry forward these objectives.

Principles underlying the Natural Areas approach: generic issues, structural causes and strong sustainability

The currently prevailing model of biodiversity conservation is one in which nature is 'sequestered' on special sites/areas and accorded a role subordinate and opposed to mainstream economic activity, in this case productivist agriculture. Nature conservation is to be pursued,

[3] As employed here, structural causality should not be confused with structuralism — the latter implies that politico-economic or policy structures are reproduced somehow automatically without recourse to the medium of conscious human agency. Structural causality here refers to real structures comprising determinate economic/political/social relations. Such structures, however, as social relations, come into existence and are reproduced only through the medium of contested and negotiated human agency. Policy structures come into existence through negotiation and contestation between powerful contituencies, commonly at the level of the state, in order to facilitate or to mitigate the contradictions of key processes (for example, capital accumulation) in civil society. In regulation theory, a coherent body of policy structures, as the outcome of negotiation/contestation, is usefully referred to as the *social mode of regulation* (Aglietta, 1979; Drummond and Marsden, 1995, 1999). Policy structures, in turn, are not automatically taken up by the social agents to whom they apply — they are mediated, negotiated and contested by those individual agents. In this way agricultural policy is 'instantiated' according to the particular social and economic circumstances of individual farmers. Likewise, the generic environmental impacts of policy will vary according to the particular ecological characteristics of individual farms. Nonetheless, the policy structures provide the basic and usually unavoidable parameters within and through which the great majority of agents must act if they are to secure the conditions necessary for economic and social reproduction.

on this 'environmental managerialist' model, on a site-by-site, species-by-species basis and awarded a separate (and usually paltry) budget for a series of discrete conservation activities that are juxtaposed to, and must match the opportunity costs of, the mainstream activities of productivist farming (Tilzey, 1998a; Bryant and Wilson, 1998). The two aspects of this policy configuration, a spatial/sectoral dichotomy between environmental and conventional farming concerns and the expectation that biodiversity will be conserved only if 'the price is right', reflect respectively the privileged role that productivist agriculture has been accorded in post-war land use planning and the fact that this has been undertaken by harnessing private property rights to agricultural expansion (see Marsden et al., 1993). To the extent that environmental conservation has been secured at all, it has been achieved only through the preservation of the 'rights' of farmers to a degree of state support through the notional extension of their property rights to cover environmental goods.

Over the last decade or so the sustainability of this 'environmental managerialist' model has been thrown increasingly into question by the concern over the future not only of special sites themselves (for island biogeographical and for management reasons), but additionally over the continuing loss of biodiversity in the 'unprotected' wider countryside. To this concern we may add those relating natural resource and social sustainabilility. Internal and external economic contradictions besetting the CAP, associated broadly with the global (but highly contested) demise of 'developmentalism' and rise of neoliberalism as the favoured mode of capital accumulation, have also begun seriously to challenge the pre-eminence of overt political interventionism in agriculture (McMichael, 1996a, b; Tilzey, 1998a; Winter, 1996). In response to such deficiencies and the new opportunities afforded by progressive reform of the CAP, there is now increasing advocacy of an integrated, whole countryside approach which the Natural Areas programme embodies. This approach not only challenges the view that nature can be conserved effectively on an isolated or fragmented basis, whether spatially or in terms of individual species, but in so doing also problematises, implicitly or explicitly, the sustainability of productivist agriculture itself. Thus, if biodiversity loss and decline can be expressed as generic issues and attributed to structural causes flowing from mainstream economic activity, it follows that biodiversity conservation cannot be satisfied simply, or in the longer term, by enhanced management of a residual resource subsisting at the margins of, and juxtaposed to, those continuing structural sources of decline. Rather, a change is required, towards environmental (and social) sustainability, in the character of that economic activity itself. This is what is meant by 'strong' sustainability (Baker et al., 1997; Tilzey, 1998a). It means that sustainability is unlikely to be secured through mitigating (in effect 'buying off') unsustainable agricultural practices, an approach embodied in the prevailing model of voluntary incentive schemes, but will need to be secured by addressing the structural causes of generic impacts, whether state-or market-led.

A structural causal/generic issues analysis, a whole countryside approach and strong sustainability are mutually defining since each derives from, or implies, the other. A whole countryside approach has as its objective not only the conservation and enhancement of semi-natural habitats existing at the margins of productivist agriculture but, additionally, the transformation of its 'infield' practices so that these conserve and enhance not only characteristic biodiversity but also the natural resources of soil, water and atmosphere. In short, its objective is farming that satisfies the requirement for the *joint production* of food and environmental goods and services (Potter, 1996; Lowe et al., 1999). In turn, and as indicated, a whole countryside approach cannot be built on the basis of environmental 'symptom' management but rather needs to address the causes of the generic issues that derive from the unsustainable practices of productivist farming. A whole countryside approach should therefore lie at the core of the Natural Areas programme.

The Natural Areas approach and agricultural policy

In what ways might the Natural Areas approach assist in the design of agri-environmental policy as a means to address issues facing the nature conservation resource and to set objectives for its safeguard, enhancement and expansion? There seem to be two key concepts that capture the relevance of Natural Areas to these functions — scale and context. Scale is important because Natural Areas provide an appropriate scale at which the character and quality profile of an area may be defined. It is therefore this concept which enables areas to be differentiated from one another and which defines the nature of localism. Such localism means in turn that it is possible to define objectives/prescriptions for nature conservation at the landscape scale which reflect the specific character of an area (the ESA scheme currently does this). The scale of Natural Areas also provides the context within which nature conservation issues/objectives can be addressed. If site specific issues can be addressed in many cases only through a whole countryside approach, then Natural Areas provide the context for objective setting to tackle such issues. In short, Natural Areas provide a meaningful scale of definition and context through which whole countryside objectives for both site-specific and wider countryside issues may be addressed (Hewston and Cooke, 1996; Tilzey, 1997a).

EN's preparation of Natural Area profiles has provided a definition of the quality of the nature conservation resource and therefore a framework for defining

priorities (Hewston and Cooke, 1996). Broadly, profiles define the nature and distribution of high-quality nature conservation resource, ecological objectives for the 'second tier' or 'less special' level and objectives for the enhancement of ecologically degraded areas. In general then, Natural Area profiles define objectives which seek to:

- conserve, enhance, and where possible expand remaining areas of high-quality semi-natural habitat (including aquatic ecosystems);
- conserve, enhance, and where possible expand 'second tier' semi-natural habitat;
- make the practices of farming more congenial to the conservation of characteristic habitats and species in the wider countryside;
- prepare targeted programmes for particular rare or threatened species where generic measures alone will not be effective.

Natural Area profiles also identify key issues that affect the quality profile and therefore identify policy objectives for action. Natural Area profiles thus provide a spatio-temporal framework for defining and addressing biodiversity objectives. This means that priorities for action can be defined in space (i.e. moving from special sites to wider countryside) and in time (i.e. a staged programme of policy change from current agri-environment programme to a whole countryside framework premised on strong sustainability — an Integrated Rural Policy).

Natural Area profiles should provide the framework for the delivery of agri-environment policy in a way that maximises nature conservation benefits. They provide:

- a description of the character and condition of the nature conservation resource;
- identification and prioritisation of issues which agri-environment policy can address;
- a framework for targeting schemes and resources;
- identification of the local character of the nature conservation resource aiding definition of objectives/prescriptions for management delivered usually by generic mechanisms modulated to Natural Area;
- setting of meaningful landscape-scale objectives for whole countryside conservation (e.g. foci for habitat expansion and re-creation).

Natural Area profiles also provide a framework for the design of agri-environment schemes. The first two Natural Area objectives listed above require schemes to deliver exacting requirements usually over and above normal farming practice (this may be described as 'additionality') (Potter, 1996). Additionality requires the use either of site-specific nature conservation objectives (EN's Wildlife Enhancement Scheme is an example) or of more generic objectives which nonetheless have the capacity for modulation to site level (the CS scheme fits this description). What both these schemes lack, however (and what will be required if whole countryside objectives of Natural Areas are to be realised) is a mechanism with the capacity to encompass a discrete biogeographical unit in its entirety (i.e. a Natural Area) and with the consequent ability to take a coherent view not merely of constituent semi-natural habitats (as in CS) but, more importantly, of the relationship between such habitats and the intervening non-semi-natural habitats that together make up the quality and character of the whole biogeographical unit (English Nature, 1996; Tilzey, 1997b). The need for such an approach is particularly pertinent in respect of species which are dependent upon a variety of habitats throughout the quality profile and which therefore render non-viable a policy approach which rigidly dichotomises special sites and the wider countryside. What seems to be required therefore is a mechanism which defines objectives at the landscape scale (i.e. the whole Natural Area) and which is, as a consequence, designed to address all objectives for the Natural Area profile, both special site and wider countryside. Such a mechanism will need to combine the ability to conserve the broader fabric of countryside character through a common prescriptive base with an ability to secure additionality on a site-specific basis. The tier structure of the ESA scheme would seem to offer an appropriate basis for the delivery of such whole countryside objectives (English Nature, 1996; Tilzey, 1997b).

Addressing generic issues and setting objectives for Natural Areas

The objective of the Natural Areas programme is to maintain and enhance those countryside characteristics which make landscapes distinct — it is thus quintessentially about local diversity. However, the structural causes that underlie the substitution of uniformity for such diversity commonly derive from processes rooted in politico-economic power structures whose 'force fields' may have a spatial breadth far greater than the local area. Whilst we should recall that extra-local influences are always mediated by the local, it is also necessary to recognise that this relationship is usually an asymmetrical one (particularly with regard to rural areas) in which the former hold differential power over the latter (see for example, Hoggart et al., 1995). This juxtaposition of local effect and extra-local cause generates two problematical issues in addressing biodiversity decline and in designing appropriate agri-environmental policy mechanisms. The first refers to the sheer scale of the task of addressing powerful and countervailing politico-economic forces. An understandable reaction here is to shrink from the magnitude of this task and to concentrate instead upon the immediate need to safeguard, by means of orthodox

managerialist policies, those elements of the remaining biodiversity resource deemed of highest conservation value. The second is the perceived difficulty or impossibility of securing local or site-specific objectives by means of much broader generic 'solutions'.

The appropriate response to the first reaction surely is that we have little choice other than to address structural causes if, in the longer term, we wish to achieve nature conservation objectives on both special sites and in the wider countryside. This, after all, is supposedly the rationale underlying the Natural Areas programme. The need for a generic issues approach does not of course deny the immediate and shorter-term necessity for 'fire-fighting' managerialist policies such as those embodied in EN's Species Recovery Programme or in a number of the UK Biodiversity Action Plans. It is increasingly obvious, however, that biodiversity cannot be conserved sustainably on the basis of its current status or within the present managerialist policy context. This is evident across almost the whole of the biodiversity resource profile. It is reflected in the difficulty of securing appropriate management and expansion of semi-natural 'infield' habitats in the typical lowland scenario; in the continuing decline of upland semi-natural 'infield' habitats as a result of ecological overgrazing; in the continuing decline in the quality and extent of semi-natural and freshwater habitats in the wider countryside; and in the continuing decline in the population and range of the 'common' farmland species of artificial 'infield' habitats and of those species dependent upon the maintenance of habitat diversity at the landscape scale (the mosaic of unimproved grassland, copses, hedgerows, arable and improved grassland).

In respect of the second reaction, the perceived problem is largely without foundation. It assumes that a focus upon generic solutions implies the definition of nature conservation objectives and prescriptions at a similarly generic level — this is not the case. What the generic approach does imply is that structural causes need to be tackled at source — for agricultural policy this should entail the replacement of productivism by a framework founded on environmental (and social) sustainability, one which enables biodiversity conservation to be secured through locally and site-specifically defined objectives (Tilzey, 1998b). A policy framework such as this needs both to remove the sources of biodiversity decline and the constraints upon habitat and species enhancement/expansion, to achieve an articulation between biodiversity needs and policy delivery mechanisms and to install the necessary infrastructure for positive environmental management. In this way, the Natural Areas programme will require linkages to be forged between the 'micro-scale' and the 'macro-scale'. Sustainability objectives must realise local objectives — diversity — but can be fulfilled only within the context of a favourable wider policy environment.

This discussion highlights the importance of identifying structural causes/generic issues if the whole countryside objectives of the Natural Areas programme are to be realised and if these are to articulate with, and be realised through, agricultural policy mechanisms. If structural causes/generic issues are to be identified, a disciplined and structured approach to issue identification is required (Tilzey, 1997a). Methodologically, the approach adopted in this paper has close affinities with critical realism (see for example Drummond and Marsden, 1999). Procedurally, this may be expressed as follows:

(1) identification of the key nature conservation features (KNCFs);
(2) identification of the symptoms (problems) affecting KNCFs (e.g. fragmentation, inappropriate management, pollution);
(3) identification of generic issue (e.g. conversion of grassland to arable, undergrazing through lack of livestock, nitrate runoff through intensive agrochemical production);
(4) identification of objectives for KNCFs (desired future condition) and generic solutions to enable these objectives to be secured (appropriate policy framework and mechanisms).

The identification of appropriate (generic) policy solutions should involve the definition of policy opportunities/constraints, both shorter and longer term, that delineate the parameters for action to secure Natural Area objectives.

This structure can be illustrated by the following example:

- *KNCF*: arable, supporting characteristic wider countryside species, for example, brown hare, skylark.
- *Symptom/problem*: decline in populations of these species.
- *Structural cause/generic issue* (*known or suspected*): specialisation of agricultural production leading to loss of pasture-arable mosaics.
- *Objectives*: (a) species requirements defined as agricultural management practice, i.e. re-creation of arable/pasture mosaics, retention/re-creation of field margin features, shift back to spring-sown cereals with retention of winter stubbles; (b) restoration of population levels to those obtaining prior to the present episode of decline or as defined in UK BAP targets, by means of the re-introduction of mixed farming practices.
- *Shorter-term policy objectives* (*symptom management)*: optimal use of ELMS and environmental conditionality on direct ('horizontal measure') compensation payments under Arable Area Payments Scheme (AAPS) for duration of Agenda 2000 (2000–2006).
- *Longer-term policy objectives* (*addressing structural cause)*: introduction of a new social mode of regulation

involving the removal of AAPS and direct compensation payments and replacement by environmentally/socially premised system of direct payments, incentives and regulation.

Taking forward generic issues analysis and objective setting

We have suggested that the majority of the symptoms of environmental loss and deterioration can be traced to structural causes rooted in adverse mainstream policy, the product of a particular social mode of regulation. If a whole countryside approach and strong sustainability are to be turned into reality then structural causes must be addressed by means of generic policy solutions — by means of a thorough-going change in the social mode of regulation.

The focus of this section is on a discussion of some of the main issues surrounding Natural Areas objective setting for agriculturally managed habitats and their associated species, and how agricultural policy can articulate with, and potentially deliver, such objectives. In setting Natural Area objectives a key issue will be the definition of 'desired future conditions'. The desired future condition is likely to be a 'vision' for the longer-term future, one that realises the goal of whole countryside conservation. This will be the notional point at which (strong) sustainability has been achieved (see Tilzey, 1998a). Shorter-term objectives will need to be defined that signify 'milestones' on the road to this notional end point, however. The emphasis of these shorter-term 'desired conditions' will tend primarily to be upon the removal of negative impacts, the priority nature conservation resource and upon a relatively limited series of positive measures delivered principally through ELMS. Such measures will focus primarily upon special sites but will also need in some measure to address wider countryside issues in so far as these are a requirement of BAPs for farmland species and habitats. In the longer term, as part of a general shift in policy towards stronger sustainability, it is to be hoped that there will be a change in emphasis towards securing positive benefits through habitat and species expansion. This will be matched by a shift in overall emphasis from special sites and their immediate contexts to 'common' habitats and species in the wider countryside, underpinned by a general move towards sustainable food production — in short, the reinforcement or re-establishment of the joint production of nature and food.

From the preceding discussion, it should be evident that the task of setting objectives is inextricably bound up with addressing generic issues, that is, with addressing farming practice and policy. This being the case, it is important to develop a framework for analysis that *articulates* these two components, the nature conservation resource and the farming practice/policy that governs its status. A first task in the development of such an analytical framework is the definition of 'structural' elements of the nature conservation resource, so that the framework is potentially applicable to all Natural Areas irrespective of their specific characteristics. We may recall that if generic issues are to be addressed it is important to identify the structural elements that make up the profile of the nature conservation resource. If the need is to define Natural Area objectives on the basis of identified KNCFs, then it is perhaps helpful to define an agricultural KNCF profile in terms of the following categories:

- semi-natural 'infield' habitats (that is, all grazed/mown habitats of high nature conservation interest including unenclosed habitats such as heather moorland);
- 'interstitial' habitats (for example, hedges, ponds, ditches, streams);
- habitats affected indirectly by agriculture (for example, river systems, open water bodies);
- 'artificial' infield habitats (arable and improved grassland);
- species dependent upon the close juxtaposition of some or all of the above habitats together with non-agricultural habitats, for example, woodlands. (This category highlights the 'added' value to biodiversity that derives from the existence of habitat mosaics.)

These five structural elements of a KNCF profile encompass the great majority of the biodiversity resource dependent upon, or affected by, agricultural practices. They provide a structured means to define generic groupings of habitats (and their associated species) and their spatial relationships, and agricultural impacts upon them, in order to identify objectives for Natural Areas. They also provide the means to assess the character of the policy opportunities and constraints surrounding these objectives. These structural elements enable us to gauge the degree of compatibility between habitat/species requirements and the agricultural practices that govern their status. The degree of compatibility must be gauged not only on the basis of agricultural practices themselves but also upon the character of the policy instruments that broadly encourage such practices. In the final analysis, this framework should enable us to define the requirements for, and assess the ease of meeting, Natural Areas objectives.

From these five structural elements of a KNCF profile it is possible to derive three key principles which will underlie Natural Area objective setting by means of the manipulation of the nature conservation resource:

(1) maintenance/enhancement of 'sensitive' habitats, viz. semi-natural 'infield', 'interstitial' habitats and those affected indirectly by agriculture — habitats in which biodiversity is affected adversely by elevated nutrient levels;

(2) expansion of sensitive habitats through reversion of intensively used land;
(3) diversification/extensification/organic conversion of intensive infield practices.

Through time the focus of objectives is likely to shift in relative emphasis from principle 1 to 3. A problem in developing a 'vision' for principle 3 in particular is that currently we have little idea of what our longer term objectives for the wider countryside and for intensive infield practices might be.[4] Certainly, a starting point would entail the conservation and enhancement of extant KNCFs in the wider countryside where these are defined as semi-natural habitats, interstitial habitats and characteristic farmland species. Thus, a general and reasonable principle underlying the definition of most Natural Area 'visions' for the wider countryside would seem to be the re-creation biodiversity/landscape to a status broadly approximating that prior to post-war productivism in so far as this is taken commonly to represent the baseline from which the majority of habitat/species loss and decline has occurred (NCC, 1984, 1990; Mitchell, 1996). It is the case, however, that significant areas, particularly those subject to intensive arable production, have been changed so dramatically and so little of nature conservation value remains that proposals for new habitats and 'creative conservation' should by no means be excluded (NCC, 1990; Adams, 1996). A guiding principle here, however, should be predicated again on the injunction to foster the joint production of biodiversity and food. Whilst, the primary emphasis in such areas will always be upon relatively high-yield agriculture (meaning that semi-natural infield habitats are always going to be relatively scarce under such circumstances), this can be undertaken in ways, principally through organic farming (see below), that actively foster biodiversity traditionally associated with artificial infield and interstitial habitats.

This issue serves to highlight a key problem in taking forward Natural Area objectives in terms of their translation into appropriate policy — namely, a common *lack* of articulation between the nature conservation resource and current agricultural practice and policy. This problem is most acute in areas of greatest agricultural intensification/specialisation where the bulk of the nature conservation resource is now peripheral to farm systems. The problem here is that many farming practices and their policy bases (embodied in the processes of 'appropriationism' and 'substitutionism') do not now articulate with the Natural Area characteristics that objectives are seeking to foster. In short, there is frequently a mismatch between the practices required to reproduce the defining character of a Natural Area (often a residue from a pre-productivist past) and those of current agricultural land use. This, of course, is precisely the reason for short-term symptom management in which 'special' provision must be made to secure (at least a modicum of) the nature conservation resource.

We can now proceed to develop the analytical framework outlined above by examining in more detail Natural Area objectives and policy requirements for one particular structural element of KNCFs previously listed, that is, for 'artificial infield' habitats (for comparable treatment of the other four structural elements and for the application of this approach to a defined Natural Area, see Tilzey, 1997a).

Example: 'artificial infield' habitats (infield practices of higher nutrient status land)

Main habitat types: arable fields, grass leys, improved/higher productivity pasture.

Structural habitat and species requirements: arable/pasture mosaics, field margins, conservation headlands, spring-sowing of crops, retention of winter stubbles, retention of high soil organic content, non or limited/targeted application of pesticides and artificial fertilisers.

Generic issues: loss/decline of arable weed species, loss/decline of characteristic farmland species (for example, insects and birds), loss of arable/pasture mosaics, shift to winter-sown crops, loss/decline of field edge flora and fauna.

Structural causes: adoption, intensification and specialisation of agro-chemically based agriculture (especially increased use of artificial fertilisers and pesticides, exacerbated by their 'insurance' and non-targeted use).

Short-term objectives (primarily symptom management): use of environmental conditionality on commodity regimes and direct ('horizontal' measure) payments, use of targeted ELMS (including Organic Aid Scheme), introduction of regulation to enforce minimum environmental standards under CAP and domestic policy.

Longer-term/generic policy solutions: transition to new (post-productivist) mode of social regulation (Integrated Rural Policy) involving transformation of commodity regimes into direct payments with most wider countryside objectives secured through basic tier payments, including wider incentives for organic conversion; underpinned by strong environmental regulatory baseline; targeted incentives for farms beyond 'policy reach'.

The great bulk of more productive land is now dominated by the ecologically impoverished environments of improved grassland and intensive arable cultivation. The

[4] Any such 'vision' of course does not simply arise, positivistically, from externally given natural parameters, but must be generated, deliberatively and constructively, through a dialectical relationship between societal normative structures and nature, a nature that is itself in part socially produced.

current land-use practices of the latter appear to bear particular responsibility for the decline in 'common' farmland species (Tucker and Heath, 1994; Fuller et al., 1995; Pain and Pienkowski, 1997). Thus, arable specialisation has led to the loss of the pasture–arable mosaics required by species such as brown hare, stone curlew and skylark, whilst the shift to autumn-sown cereals has entailed, firstly, a drastic reduction in winter stubbles required by many seed-eating birds and, secondly, unsuitable nesting conditions for species such as corn bunting and lapwing.

A number of measures could be adopted to address such declines including the creation of field and fallow margins, conservation headlands and beetle banks, a shift back to the use of spring-sown cereals and, where feasible, the adoption of mixed farming practices to re-create arable–pasture mosaics. Current farming systems and practice can *in theory* fulfil all these objectives with the exception of the last. This is because they can be implemented at the margins of current intensive practice or require only a rescheduling of that practice. The major constraints comprise, however, first, the likely adverse impacts of such proposed measures on farm profitability within current market/policy structures, and second, the rigidities of present policy in relation to commodity regimes. Thus, the high opportunity costs of reverting arable land renders diversion to less intensive conservation use outside AAPS set-aside prohibitively expensive, whilst the profitability of arable vis-à-vis livestock production, combined with commodity regime rigidities, renders a return to mixed farming unlikely in the shorter term.

These conclusions suggest that conventional agriculture can in theory be made more congenial to 'common' farmland species via improved management of interstitial habitats, creation of field and fallow margins and beetle banks.[5] These measures are all 'field edge' in character, however, and infield practices remain as uncongenial to biodiversity as before. Biodiversity enhancement on this conventional model is purchased essentially through diversion of land out of intensive (agro-chemical) production. It is uncertain whether such measures alone will be sufficient to secure biodiversity objectives. What this conventional model is unlikely to achieve is a shift back to spring-sown cereals; what it cannot achieve, because of its structural characteristics, is, first, the increased adoption of mixed farming practices and, second, the increased availability of infield food sources, for example, seeds, insects and soil organisms, that are necessary products of the restricted use/elimination of agro-chemicals and the application of organic manures (CPRE/WWF, 1996; Tilzey, 1997a; Pretty, 1999). In short, the structural characteristics of agro-chemical production, reinforced by current policy structures, prohibit the re-establishment of joint production necessary to secure the full range of biodiversity objectives.

In this regard, the introduction of genetically modified organisms (GMO) crops has sometimes been advocated as a means to reduce the intensity of agro-chemical usage. However, scepticism regarding this and related claims centre on three main areas of concern:

- with crops guaranteed to be herbicide- and insect-resistant, farmers could spray more broad-spectrum weed killers like Roundup with the consequent eradication of all non-crop infield and field-edge flora. The result is likely to be a further drastic reduction in the variety of farmland wildlife, that is, few wild plants and serious reductions in farmland insects and birds;
- the likelihood of GMOs inter-breeding with wild relatives to produce aggressive, herbicide-resistant superweeds;
- if genetically modified seed passes on insect resistance to wild cousins, insects which depend on wild plants could be denied their only food source. The effects could then knock onto organisms higher up the food chain (English Nature, 1999a).

However, the probable development of herbicide-resistant weeds, either through genetic transferral or natural selection, is likely to negate any short-term benefits perceived to arise from the use of GMOs (these benefits being of course relative only to current agro-chemically based intensive regimes). As a symptomatically managerialist response to the contradictions of current conventional production (and incidentally as a means of enhanced accumulation for input manufacturers), GMOs are likely further to reinforce agricultural specialisation and dependence of farmers upon external inputs and therefore upon the agro-chemical companies as suppliers of the 'complete package' of both GMOs and pesticide. With this will come the further divorce of agriculture from local environmental character and local economies.

[5] It has been suggested that integrated farming systems (IFS) and integrated crop management (ICM) offer *the* way of getting a conservation/sustainability element (sic) into agriculture, i.e. that these systems offer environmental benefits without major increases in cost. Certainly they may be compatible with some sustainability criteria, as indicated above. The primary focus, however, is on increasing the efficiency of input use to maximise profitability and farmers may continue to use relatively intensive systems and to become progressively more specialised. Unlike organic and low-input systems, they permit a relatively high level of pesticide use and there is no preference for mixed farming. There is no requirement for ICM farmers to comply with any specific rules so that it is unclear to what degree environmental concerns impinge on agronomic priorities when management decisions are taken. At present, therefore, integrated systems address only a certain number of environmental sustainability criteria and exclude others, for example, a continued heavy reliance on external, non-renewable and fossil-fuel derived inputs. Integrated systems thus fall within the environmental managerialist/ecological modernisation approach — that is, they attempt to reduce in some measure the ecological 'footprint' of what remains a basically unchanged configuration of intensive, agro-chemically based production.

The above objectives for joint production and biodiversity can be secured, however, by organic agricultural systems. Organic systems incorporate features that will be central to objectives for 'infield' practices, viz.:

- rotations incorporating grass leys and legumes;
- reliance on animal and green manures produced within the farm, rather than on synthetic fertilisers;
- very little use of chemical pesticides;
- sustainable use of soil, water, atmosphere and agri-biodiversity.

Organic farming thus will tend frequently to comprise mixed crop and livestock systems. Such characteristics themselves contribute to meeting a range of sustainability objectives. They generate a mosaic of habitats; they require lower levels of pesticides and other agro-chemicals since land is rotated; less requirement for inorganic fertilisers to maintain fertility and easier disposal of organic manures on arable land within the farm; benefits for biodiversity in terms of field mosaics, maintenance of hedgerows, low application of pesticides and inorganic fertilisers, high soil organic content (English Nature, 1999b).

In short, a range of biodiversity and wider sustainability objectives is secured as a *systemic* outcome of organic production, making it inherently easier to attach any 'additionality' needs (i.e. management of semi-natural infield habitats) as integral parts of a whole farm system. This contrasts markedly with intensive, conventional agriculture in which, as we have seen, biodiversity conservation has to be secured by placing land essentially outside the production system (purchased at considerable expense through ELMS). Where biodiversity conservation is to be achieved through changes in infield practices and cropping patterns on conventional farms, its objectives run counter to, or at least compromise, the primary economic logic of the production system. In short, conventional agriculture runs against the grain of environmental sustainability, with the result that specific measures have to be welded onto it artificially in attempted mitigation of its adverse impacts. The objectives of organic agriculture and environmental sustainability appear by contrast to run in the same direction, with the result that organic agriculture may be described as the system (where complemented by a wider policy framework for environmental and social sustainability) that holds out the best prospect of reversing the negative impacts of productivist farming practice.

The analysis of 'structural' habitat types presented above suggests that, in the shorter term, both priority and feasibility will continue to dictate that semi-natural infield habitats (particularly in situations where these habitats are 'peripheral' to the farm system) are the primary targets for conservation action and funding. At the same time, however, and within the largely unchanged policy configuration given by Agenda 2000, more productive land may see more ambitious programmes to reduce habitat fragmentation and enhance populations of characteristic farmland species through pilot schemes delivered perhaps through new ESAs, wider use of CS and other ELMS (and assisted in some measure by environmental conditionality). In a more radical policy departure, less agriculturally productive areas could witness a progressive 'greening' of the CAP through the application of the Rural Development Regulation (RDR) under Agenda 2000. The efficacy of RDR is likely to be constrained, however, by its contradictory relationship to the continuing productivist orientation of the CAP commodity regimes, an effect most marked in areas of more intensive agriculture. Despite the introduction of measures that carry forward the decoupling of support from production (Winter and Gaskell, 1998), Agenda 2000 still perpetuates the fundamentally self-contradictory nature of the CAP, counterposing as it does limited support for environmental/social sustainability to continuing largesse for productivist agriculture. Thus, the final Berlin agreement on Agenda 2000 allowed (at individual member states' discretion) only 20% of 'horizontal measure' compensation to be re-directed to programmes within the RDR. The resulting (potential) modest increase in funding for agri-environment and other measures (such as announced by MAFF in December 1999), whilst welcome, still fail to address the highly asymmetrical and wastefully competitive relationship between commodity support/compensation, on the one hand, and RDR incentives, on the other. If, over the medium/longer term, sustainability is to be achieved, this self-contradictory relationship must be addressed.[6] A sustainable CAP is likely to require a transformation of production-related payments, via environmental conditionality attached to degressive direct (horizontal measure) payments, to an eventual 'recoupling' of support to environmental/social objectives (UK Countryside Agencies, 1998; Tilzey, 1998a). At this point, the CAP will have been replaced by a new mode of regulation embodied in an Integrated Rural Policy.

[6] The accession to the EU of the first wave of East and Central European Countries anticipated for 2003 will serve to point out with even greater clarity the contradictions and inequities of Agenda 2000. Thus, one of its main provisions, compensatory horizontal measures, will not be applicable to these accession countries, leading in effect to a twin-track EU. Nevertheless, any extension of EU support prices to accession countries will serve not only to heighten budgetary difficulties but will, in the absence of a very significant increase in RDR monies, usher in a process of rapid biodiversity loss/degradation as farmers strive to maximise incomes by productivist means. This is likely to be accompanied by a process of farm restructuring and amalgamation. This triple budgetary, environmental and social crisis is likely to precipitate a more rapid re-appraisal of Agenda 2000 than would otherwise be the case.

Putting in place appropriate policy mechanisms: opportunities, risks and contradictory forces

The achievement of whole countryside objectives for Natural Areas, embodied in an Integrated Rural Policy, will depend in the first instance upon a reform of the CAP that entails the removal of incentives, through production-linked support, to undertake environmentally damaging activities (that is, the removal of 'perverse' subsidies). Whilst a necessary condition, however, the mere removal of perverse subsidies will be insufficient to secure sustainability objectives (Potter, 1996; Potter et al., 1999). The abandonment of support of any kind will leave the 'free' market, ceteris paribus, to determine land-use decisions. Unfortunately, market liberalisation, under the prevailing global conditions of competitive capitalism, will generate unavoidable pressures for the externalisation of environmental and social costs. Whilst the removal of perverse subsidies will generate some environmental benefits, these are likely to be outweighed by the negative impacts of neo-liberal policies both in terms of shorter-term adjustments to production and in terms of longer-term structural changes (Doyle et al., 1997; Marsden, 1998; Potter et al., 1999).

Under this neo-liberal ('market' productivist) scenario, global comparative advantages are likely to be realised, or at least attempted, throughout much of the arable belt, for example, with production directed towards the continued supply of mass food markets. A continuation of the current configuration of intensive, agro-chemical production is therefore likely under this scenario, despite some infield extensification driven by the need to cut 'discretionary expenditure' during the period following withdrawal of support (Potter et al., 1999). We can therefore anticipate in these circumstances a perpetuation of productivism, driven this time however by market imperatives rather than by the overtly political objectives of the CAP. In the resulting competitive 'race to the bottom' (Marsden, 1998) the high opportunity costs of diverting land, investment and management to conservation use or to environmentally beneficial extensification mean that environmental 'policy reach' will be limited. Incentive schemes will be able to meet such opportunity costs only on marginal land and will therefore tend to 'cherry pick' only those sites considered to be of the highest conservation value. Throughout much of the wider countryside, therefore, the only means of securing compliance with environmental objectives cost-effectively will be by means of tighter regulation and/or draconian 'green' taxation, proposals which, however, are likely to be opposed vehemently by those who construe such measures simply as impediments to the realisation of global comparative advantage.

In much of the uplands, to take another example, the removal of all support would similarly generate negative environmental consequences, but for rather different reasons. Here global comparative advantages in a liberalised market are unlikely to be realised and structural changes will involve farm abandonment and amalgamation with deleterious consequences particularly for the management of the semi-natural infield habitats that are *integral* features of farm systems in these areas. Such widespread environmental (and social) disbenefits of neo-liberalism in these 'integral' situations will require extensive mitigation of a kind that minimalistic and highly selective agri-environmental schemes will be unable to deliver. Intervention will need to be of a scale and scope that matches the need for widespread retention of the joint production of food and biodiversity upon which the latter in 'integral' areas particularly depends (Potter, 1996). The concomitant move away from productivism and its singular pre-occupation with maximising stock density should afford, under an Integrated Rural Policy, additional opportunities for the appropriate management of extant native woodland and its expansion through natural regeneration and/or planting, where this does not compromise existing biodiversity.

Again, in the mixed farming belt between the arable zone and the uplands, a neo-liberal scenario is likely to entail the sale of smaller farms and their absorption into larger units engaged primarily in dairy production. Past experience suggests that such a process of concentration and intensification of dairy production is accompanied by an increase in temporary grass of low conservation interest and a general intensification of grassland management on holdings. This is likely to entail a general degradation of habitat-rich smaller farms as these are absorbed by larger farms seeking to rationalise and homogenise farm layout and field structures. Furthermore, the amalgamation of holdings to create large dairy units managed by a core of the more successful farm families, by decreasing labour-to-land ratio, may mean progressively less labour time available for countryside management on the economically most viable farm (see, for example, Potter et al., 1999).

The realisation of whole countryside objectives is therefore extremely unlikely to be delivered by a liberalised market, *pace* some neo-liberal proponents (see, for example, MAFF, 1995). Rather, it will require the adoption of a new mode of social regulation predicated on active intervention and support by public policy. Its rationale will be neither political nor market productivism and their concomitants, the externalisation of environmental and social costs, but rather the joint production of food and biodiversity and their concomitants, the sustainable use of natural and social 'capital'. As Marsden has noted, there are encouraging signs of emerging support for such a mode, particularly in mainland Europe, in 'the discourse of sustainability, regional and agricultural heterogeneity, [and] organic and ecological farming …'(1998; p. 270). So far as biodiversity is concerned, support structures within this mode

would need to be designed in such a way as to achieve the conservation of the broader fabric of the countryside whilst, at the same time, delivering additionality on special sites. The ESA scheme provides perhaps an (albeit imperfect) prototype for such an approach, combining as it does basic tiers for wider countryside management with higher tiers to deliver more demanding wildlife and landscape objectives (Tilzey, 1997b). Perhaps an ideal delivery mechanism for whole countryside objectives would be an ESA co-extensive with each Natural Area. These ESAs would comprise a number of tiers that would encapsulate management options for the whole of the Natural Area profile. These management options would address three basic situations: first, sensitive (maintenance and enhancement of semi-natural habitats); second, diversion/reversion (habitat expansion and creation); third, extensive/organic (adoption of extensive conventional or, preferably, organic systems of 'intensive' infield production).

This model would be most readily achievable in 'integral' situations since, first, farm management structures are still in place to secure both wider countryside and special site objectives and, second, economic marginality means that farmers will fall more easily within 'policy reach'. By contrast, this model would be more difficult to achieve in areas of higher agricultural productivity, first, because biodiversity is now often peripheral to, or completely outside, the farm system and, second, because relative economic buoyancy means that farmers are not brought readily within policy reach. In respect of the latter scenario, it might appear that the most that can realistically be achieved is the conservation of what little remains of semi-natural 'infield' habitats in these areas (achieved essentially outside the farm system), together with perhaps very limited reversion/extensification of more productive land, and certain field edge measures. It should be recalled, however, that the conservation of fragmentary semi-natural infield habitats depends in the longer term upon the expansion of this resource into the wider countryside. This 'peripheral' model also fails to address the conservation of 'critical' species dependent on both special sites and the wider countryside, and the conservation of formerly 'common' farmland species. It also fails to address a range of other sustainability objectives relating to soil, water, atmosphere and the longer-term viability of rural communities and economies.

These observations serve to emphasise the need for financial support under an Integrated Rural Policy to be underpinned by a strong regulatory baseline. A baseline of this kind would prescribe statutory standards of management (a statutory Code of Good Practice) and proscribe certain damaging land-use changes such as ploughing of permanent grassland in sensitive locations (for example, adjacent to rivers), new drainage work, removal of hedgerows, etc. (UK Countryside Agencies, 1998; Tilzey, 1998a). Regulation would also need to enforce environmentally defined levels for nitrates and pesticides. Such measures would constitute legally defined environmental standards, the introduction of which would draw legitimacy from society's insistence on certain property rights in the sustainable use of environmental resources. This would force an internalisation of environmental costs by the farming community and delegitimate compensation being paid, as currently occurs under the CAP, to prevent activities that breach the polluter pays principle. This internalisation of environmental costs would provide a significant stimulus to farmers to move from conventional to organic systems and hence mark a key step in securing whole countryside conservation.

The introduction of an Integrated Rural Policy and the regulation of agriculture's environmental impacts are not, of course, simply technical issues, but involve a whole process of re-orientating a social and occupational community. Education and efforts to change values and institutional structures must therefore be integral to any effective regulatory strategy to promote a sustainable agriculture (Lowe et al., 1997). Since it is extremely unlikely that there will be an immediate substitution of 'green payments' for production support in the manner delineated in this paper, the likely gradual transformation of the current productivist framework into a system of environmental/sustainable food production payments would provide for the necessary co-evolution of farming attitudes and institutions. However, Integrated Rural Policy should be seen as part of a wider process of re-ruralisation and re-population of the countryside in which incentives are provided for re-entrants into agriculture and for more labour-intensive agricultural practices that organic production implies and countryside management requires. Regulatory structures necessary to secure social equity objectives must be part and parcel of this process.

Aside from the significant politico-economic obstacles that remain in the path of Integrated Rural Policy within Europe alone (despite emerging constituencies of support, 'political' productivism retains strong support in mainland Europe whilst 'market' productivism is championed by Britain, particularly MAFF (see MAFF, 1999)), change in this direction cannot realistically take place in isolation from the broader context of international agreements relating to both trade and the environment.[7] Unfortunately, the international trade

[7] It should perhaps be noted here that climate change is an imponderable but of course overarching problem in this regard. The measures proposed in this paper as part of an IRP help of course (as part of a larger suite of economy wide measures) to reduce/slow global warming by ensuring that farming operates within key sustainability boundaries. They do this by eliminating or minimising the use of fossil fuels in the form of artificial fertilisers, pesticides, fuel, transport, etc., by maximising the use of renewable on-farm resources and by emphasising localism wherever practicable. Organic production is a key component of such measures.

context, embodied in the GATT/WTO, is, and without reform is likely increasingly to become, antithetical to the policy objectives and instruments at the core of the proposed Integrated Rural Policy. This is because free trade, a central tenet of GATT/WTO doctrine, tends, within the current politico-economic context, to externalise environmental and social costs in the search for enhanced competitiveness (Marsden, 1998). This statement, of course, runs counter to neo-liberalism's own assertion that a less interventionist agriculture will deliver 'win–win' gains for the world economy and the environment. The view indeed still prevails amongst many policy-makers that freer trade can be associated unequivocally with the greater social and environmental good. This view is founded on the twin neo-classical axioms of 'comparative advantage' and the 'optimal allocation of resources'. On this argument, everyone benefits from the additional production and consumption that is possible when trading nations exploit their putative comparative advantages. Liberalisers thus place their faith in perfectly operating markets and attack interventionist measures as a source of resource, and by implication environmental resource, misallocation (Tilzey, 1997c).

These neo-classical axioms appear to permit, however, a rather convenient conflation of what are actually quite distinct economic as opposed to environmental/social meanings and objectives. Semantic conflation of this kind attempts to mask the real logic informing neo-classicism/liberalism — that is, that the monetary cost of production to individual capitals should be minimised and that capital should be invested wherever cost/profitability is least/greatest (Tilzey, 1997c). In the absence of countervailing regulatory structures, this logic exerts a systemic and inescapable pressure upon individual capitals to avoid meeting the full or true environmental or social costs of production. Since the regulatory structures necessary to secure environmental/social sustainability do not yet obtain either within individual states or internationally (in no small part due to consistent opposition from globalising economic interests), it seems inevitable that the logic of free trade and competition, within the current global context, will entail the systematic externalisation of environmental and social costs on the part of individual capitals. This analysis would appear to provide strong theoretical grounds for supposing that the objectives of neo-liberalism and environmental/social sustainability are contradictory rather than complementary, rendering the ideal of sectoral integration and joint production in agriculture highly unlikely in the absence of fundamental change in the character of global market interactions and their social relational underpinnings.

The contours of neo-liberalism just described suggest that, under conditions in which it prevails, agricultural policy change will be driven by the narrow competitive logic of private capital. If, under a developmentalist regime, the environment has been hitherto a peripheral concern and measures to protect it have been introduced opportunistically on the back of policies whose primary rationale lies elsewhere, then under neo-liberalism we can anticipate a reinforcement of this scenario. Neo-liberal arguments are deployed by those who seek to replace the greater level of direct state regulation of capital accumulation characteristic of developmentalism with a system in which accumulation decisions lie overwhelmingly with private companies left as free as possible to pursue their own, often short-term, profit motives. As we have suggested, neo-liberal strategy as globalisation is well evidenced within the agro-food sector. The single most powerful force driving this neo-liberal strategy is of course the USA and the origins of that country's advocacy of globalisation lie within its own crisis of developmentalist accumulation (McMichael, 1994; Schaeffer, 1995). Thus, during the course of the late 1960s and 1970s, the USA was increasingly persuaded of the need to bring agriculture into the GATT because of a growing balance of payments crisis and the simultaneous identification of export agriculture as a strategic trade weapon. Additionally, by the 1980s the EC was exporting onto world markets, bringing it directly into competition and confrontation with the US agricultural export strategy which a restructured American agriculture and new multi-national food companies were now demanding. The new emphasis upon commercial exports now demanded trade liberalisation to maximise US 'comparative advantage'. The US succeeded in placing the question of agricultural protectionism at the top of the agenda when the Uruguay Round of GATT was convened in 1986. Although the rhetorical goal at this time was 'free trade' based on 'comparative advantage', the substantive aims of the US administration appear to have been quite neo-mercantilist in character in that the US sought to pursue a 'breadbasket of the world' strategy rather than simply the objective of comparative advantage in a multilateral trading system (McMichael, 1994; Schaeffer, 1995). Indeed today, in respect of the USA if not of the other Cairns Group countries, free trade rhetoric is still deployed to disguise the presence of strong neo-mercantilist objectives related to its wider geo-political ambitions.

The endpoint of the GATT Uruguay Round was, of course, the creation of the WTO, intended to institutionalise freedom of trade, enterprise and property rights on a global scale. The envisioned unification of the market for mass food producers (market productivism) is likely to further accumulation strategies by TNCs by enhancing capital mobility and reducing control of market and production sectors by national companies (Heffernan and Constance, 1994; Heffernan, 1997). A major rationale behind trade liberalisation is therefore the enhancement of commodity exports for mass food markets from the USA and other countries of the Cairns Group. A WTO regime is not simply a device for the global

circulation of commodities, however. It is also a new supra-national political entity with a distinctive constitutional focus and enforcement rules concerning commodity circuits and national/supranational regulations (McMichael, 1997). Arguably, it will operate as an enforcement mechanism of market rules for the globally dominant corporations and states. Pressures to deregulate farm sectors in the global North and to expand agro-exporting in the global South constitute a universal challenge to national economic organisation and institutions by transnational firms and their sponsoring states. Global access by TNCs allows them to exploit, as comparative advantage, the asymmetry in environmental and social standards between global North and South, undercutting Northern entitlement structures and their institutional supports through the optimisation of global sourcing strategies (Heffernan and Constance, 1994).

Within Europe, as suggested, the neo-liberal vision is one in which agriculture retains its (technological) productivist configuration in the supply of mass food markets (perhaps with the exception of enclaves devoted to the supply of organic produce to mainly middle-class markets). Those farmers who survived the transition to a liberalised regime would be locked, as is now increasingly the case, into vertically organised food chains dominated by the power of corporate retailers and manufacturers. Such relations are increasingly global in character and subject to changes that demand intensity of production and scale economies (Marsden, 1998). The logic underlying such innovations as genetic manipulation within this context should be evident, giving as they do added power to the downstream sectors, the TNCs and corporate retailers.

Clearly, the logic of neo-liberalism, embodied in the WTO, dictates that environmental (and social) regulation and support should not compromise comparative advantages. Thus, the GATT Agreement of 1994, particularly through the Agreements on Agriculture and Subsidies, sought to begin the process of outlawing measures that might support environmentally sustainable production (particularly where this entails 'joint production') and that might enable discrimination between sustainable and unsustainable methods of production (Doyle et al., 1997). Strong sustainability, embodied in Integrated Rural Policy, requires, by contrast, the full internalisation of environmental and social costs of production. This demands, in turn, a fundamental reappraisal of the neo-classical theory of comparative advantage that underpins free trade advocacy (Tilzey, 1997c). It requires that governments intervene to prevent damaging restructuring and re-location of production patterns and that they commit resources to sustaining producers who deliver environmental (and social) goods and services (Burney and Hamersley, 1999). It also demands, inter alia, that consumers be given the informational means (eco-labelling, for example) to discriminate between products on the basis of their contribution to sustainability (English Nature, 1999b). These sustainability criteria demand important changes to current GATT/WTO rules as embodied, particularly, in the Agreement on Agriculture, the Agreement on Subsidies and the Agreement on Technical Barriers to Trade (see WTO, 1994). Most importantly, it requires that the next WTO Round does not push the EU further down the road towards a 'radical decoupling' scenario in which the ideal of 'joint production' in European farming is finally abandoned. Rather, what appears to be needed is an international trade framework that not merely allows environmentally sustainable production but actively seeks to outlaw comparative advantages of production achieved through the externalisation of environmental and social costs.

The forces ranged against the adoption of such proposals are, as we have seen, very considerable indeed. Recent developments relating to the stalling of the new WTO Millennium Round and opposition to corporate-driven introduction of GMOs give cause for cautious optimism in this regard, however. Additionally, the social democratic tradition of market interventionism in Europe, together with the likely vulnerability of the majority of its farmers to processes of neo-liberal restructuring, means that, potentially, there exists a wide constituency of support within the current and expanded EU for a rural policy premised on the notion of 'green (and social) intervention'. Indeed, it would seem to be a widespread European view that environmental and socio-economic sustainability are complementary, with an attractive countryside being dependent upon management by large numbers of farmers. The challenge for policy makers and for civil society more widely will be to seek to ensure that current 'political' productivism is succeeded not by a further round of restructuring and capitalisation in agriculture, as advocated by neo-liberalism, but rather by a policy framework that successfully articulates and delivers the environmental and social dimensions of sustainable development.

Conclusions

The Natural Areas approach potentially provides EN and others with a framework with which to take forward their goal of whole countryside conservation. In so doing I have argued that there is a need to understand, and to address, the generic issues/structural causes that underlie the changing and generally deteriorating status of biodiversity in agro-ecosystems. If generic solutions, rather than symptom management, are to be the way forward, as this paper has argued they should be, then we need a means by which we can articulate constituent components of the biodiversity resource with policy delivery mechanisms and farming practice. In order to do this, I have sought to develop a structure that defines key

elements of agro-ecosystems in terms of their farm management requirements. I have also sought to outline the opportunities and constraints with which policy makers and wider constituencies will need to engage if whole countryside objectives are to be secured. In taking a generic issues approach and in undertaking a risk assessment of political/economic opportunities and constraints, it is hoped that EN and others more usually predisposed to environmental managerialist approaches will be encouraged to take a more strategic and structural view of agricultural policy, and indeed, of rural policy in general. This will entail the forging of stronger linkages, both empirically and normatively, between politico-economic processes, environmental change and sustainable outcomes.

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