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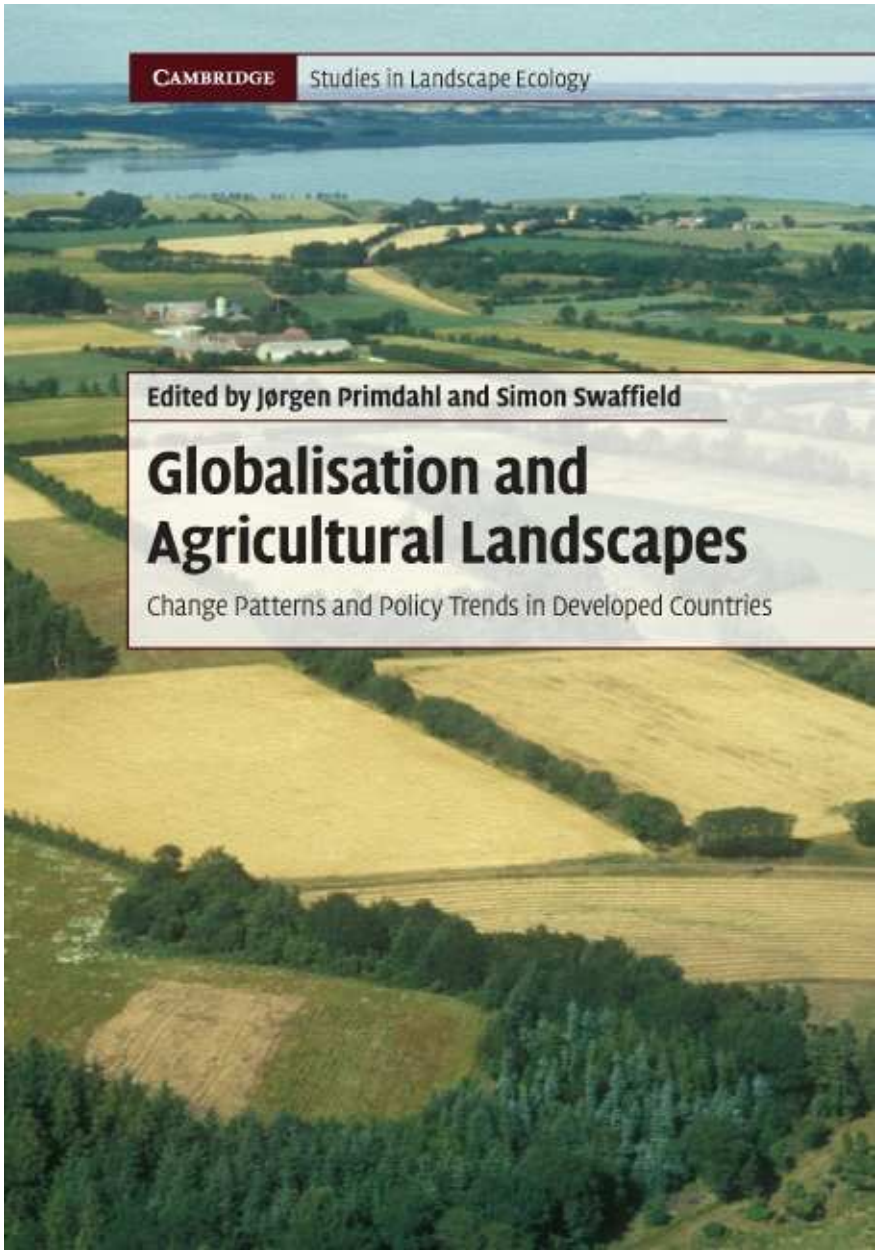

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Globalisation and the sustainability of agricultural landscapes

The primary agent: two farmers in the same global space

When the young Danish dairy farmer, Svend Petersen, completed the last round of his large cowshed on a dark November night in 2007, New Zealand farmer Gordon Grey of the same age had just started his working day by checking the operation of his centre pivot irrigator. The two farmers are, as individuals and as members of two distinct societies, of course different. At this particular point in time their immediate situations were also quite different – Petersen was working indoors with dark, cold and wet weather outside, whereas Grey was enjoying an early spring morning.

Despite these practical differences the two farmers shared a number of common conditions. They both had smiles on their faces, as milk prices on the open global market had risen over the previous year and they had each received substantial increases in payments per kilogram of milk. Both farmers deliver their milk to dairy cooperatives which are among the largest multinational dairy corporations in the world. They are part of a global food network driven by corporate marketing strategies and benefit from economies of scale, but neither farmer has any influence on how their milk will be processed. At this moment in time they are also competitors, but it is quite possible that they may become partners, as the two companies are cooperating and may merge in the future.

The farmers' relationship with their local landscapes is primarily shaped by their agricultural practices, particularly management of land and stock, although these in turn affect (and are affected by) landscape pattern, process and appearance. Grey may have arrangements with nearby farmers for the production of fodder crops in the winter months, but Petersen is unlikely to

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have any cooperation with his neighbours at all concerning farming. Both of the milk producers are linked primarily to vertical commodity networks.

However, like many other farmers in the industrialised world, they live and work in a rural landscape, and are rural property owners. If you ask them if they manage the landscape with motives other than economic production, they – or (quite often) their wife – will offer a number of examples which have more to do with the farm as a place to live than with dairy production. They might mention planting to give shelter to the farmhouse, and habitat for birds and other wildlife, or the creation of a pond for wildfowl and for 'a place to walk at night', as a farmer's wife once explained. If they are asked if they interact with neighbours on community matters, such as schools or sports clubs, it is likely that they will give a positive answer. They are, in other words, active inhabitants of a place, and this 'place' is their local landscape.

Both farmers have strong views about this landscape – although they are quite likely to be different. Maybe one of the farmers will emphasise the advantages of location, being close to local towns or amenities. Maybe the other will talk warmly about the specific character of his locality. It depends on how the farmer is attached to his landscape, on their place identity. Asked about wildlife, they will also present different stories, as they live in very different biogeographical regions. However, it could be that both of them talk about how wildlife was much more diverse and abundant when they were children, before habitats were destroyed by new machinery and chemicals. They may note that wildlife is now starting to improve again in some areas, and even explain to you that their interest in wildlife and the outdoors generally was one major reason why they chose to undertake an agricultural education and become a farmer.

If we continue the survey and ask how they regard current public policies that affect their farming, we are likely to get critical replies from both of them, but they may be quite different in substance. The Dane, Petersen, will probably complain about bureaucracy and the increasing number of government restrictions imposed upon how he manages his farm – such as nutrient balance sheets, pesticide use reports, and habitat protection schemes which prevent him from fertilising an old meadow which could have been used as part of his expansion strategy. These, and other similar regulations – he may say – make it difficult for him to compete with farmers from other countries that do not have similar, detailed 'limitations'. Petersen will probably not mention that he gets a substantial part of his income from subsidies paid for by the European Union.

The New Zealander, Grey, on the other hand, will probably express strong views about the public subsidies given to European and American farmers, which combined with tariffs and quotas, make it 'impossible for him to compete on a level playing field'. He may also complain about the local

environmental regulations – especially about those which require resource management applications for some types of development, such as consents to irrigate, with uncertain outcomes. However, like Petersen, he will also take some of his business conditions for granted and not mention them – for instance, the right to farm as he chooses and to use water at no charge, cheap electricity prices, and a well-developed public road network.

Over time, the two farmers, living on opposite sides of the planet, have become increasingly interlinked. They produce for the same markets, and their conditions of production are associated with the same type of global food networks. They are each subject to the same international policy agendas, although the specific policies under which they operate are different. And, whilst the agricultural landscapes in which they work and live are different in pattern and function, these landscapes are also, like the farmers, increasingly affected by the same types of change, and are converging in character under the dynamics of globalisation.

Globalisation and the local landscape

Giddens (1990, p. 64) concluded that globalisation is particularly characterised by the speeding up of worldwide social relations. Local activity increasingly becomes part of global networks, which are shaped by and in turn shape worldwide events (Gray, 2002, p. 57). Held *et al*. (1999) suggest 'expanding' as a key word to describe this transformation of the spatial organisation of social relations. New transcontinental or interregional flows and networks of activity, interaction and power are created, and it is the specific combinations of different dimensions of this 'expansion' – their extent, intensity, velocity and impact – that determine how societies or communities change. These activities in turn shape local landscapes, and the specificity of response is even more significant for landscape change, because the natural conditions – geology, climate, hydrology and wildlife – vary in space and time (Swaffield and Primdahl, 2006). Each agricultural landscape is therefore a unique entity.

In a more concrete characterisation of globalisation, Harvey (2000, pp. 61–67) identified four highly interlinked processes: waves of technological changes, financial deregulation, the 'information revolution' and the 'de-materialisation' of space, and significant reductions in the time and cost of moving commodities and people. These four shifts are accompanied by other important features, including (among others) changes in the form and organisation of production, major expansion of the wage labour force, greater mobility of the global population, and hyper-urbanisation (the proportion of the population living in cities has doubled in 30 years). These transformations have in turn caused a revolution in the spatial organisation

of the world's population, and 'seemingly' produced a new set of global environmental problems.

All these dimensions of globalisation are relevant to the way that agricultural landscapes are changing everywhere. In the next section we elaborate on two features of particular significance, organisational changes in agricultural production, and the extension of urban systems.

Key driving forces: changes in agricultural production and urbanisation

A great proportion of the rural landscapes in the world are agricultural landscapes. In the Organization for Economic Co-operation and Development (OECD) countries, agricultural land use – from intensive arable fields to extensively grassed pastures – takes up about 40% of the total land area (1995–1997), a figure which rises to 50% if Canada is not included (OECD, 2001). This makes agricultural change both a major driving force affecting rural landscapes, and a key factor in the various processes of globalisation.

Agriculture produces, maintains and changes landscapes, and agriculture in turn is affected by technology, market and policy interventions (Jones, 1988; Brandt *et al*., 1999; Bürgi *et al*., 2004; Jones, 2005). It has undergone dramatic changes on a global scale over the last two decades, as the area being tilled and grassed has expanded and production has intensified. Furthermore, whilst the area in some other types of production may not have grown significantly, intensification has continued. Between 1966 and 1990, for example, the rate of increase in grain production was 1.9% per year. Ninety-two per cent of this is due to increases in yields (Evans, 1998, 2008). Increased use of fertilisers, the development of new crops, and increased use of herbicides are three main factors in increased yield per crop, but a speeding up of crop rotations and increases in the irrigated area are also important elements of the intensification. The landscape impacts of these developments have been immense, both for the environment (including biodiversity loss, soil erosion, water contamination and eutrophication) and for cultural values (including loss of historic features, scenery and recreational access) (Meeus *et al*., 1990; Stoate *et al*., 2001; Tilman *et al*., 2002; Butler *et al*., 2007).

However, agricultural change also includes extensification or abandonment of agricultural production, most often in landscapes with difficult conditions due to poor soils, steep terrain, lack of water (or the opposite, lack of drainage) and other biophysical constraints. Decline of agriculture's role in the rural economy, structural developments in agriculture and urbanisations are important driving forces behind marginalisation processes (Brouwer *et al*., 2008). Since these 'marginal' landscapes are often characterised by high biodiversity, and a concentration of historic features and scenic values,

abandonment of agriculture can also mean loss of landscape values – often associated with increased risks of erosion and fires (Pinto-Correia and Mascarenhas, 1999; European Environmental Agency, 2004; Brouwer *et al.*, 2008).

Agriculture (and the agricultural landscape) is also affected by more complex social processes, such as the restructuring of the food sector as a whole, and ongoing urbanisation. The development of highly integrated, so-called vertical food-networks links the production of food in one landscape with household consumption in another landscape often far away. This linkage is developing with increasing speed, and is, as we have described above, at the core of what is defined as globalisation (Giddens, 1990; Held *et al.*, 1999). Formation and continuous growth of international food networks are increasingly affecting decisions taken by the individual farmers all over the world. The replacement of local food regimes and increasing external expectations imposed on farmers concern not only the type of food produced, and the quality of the food products, but also the way it is produced (Watts and Goodman, 1997; Marsden, 2003; Morgan *et al.*, 2007). Global food markets are becoming 're-regulated' within the commodity chain to meet the growing demands of affluent consumers and the corporate retailers who provide for them. This involves the 're-naturalisation' of foods as well as their continued industrialisation (Marsden, 2003, p. 26).

Both the 're-naturalisation' of farming and industrialisation impose their footprints upon the agricultural landscape, and these impacts have resulted in a number of policy measures, both public and private. The two dairy farmers introduced at the start of this chapter are highly affected by this 're-regulation' of agriculture, although the form and content of the regulation measures vary, with the public policy interventions being more restrictive and detailed for the Danish farmer than for his New Zealand colleague. However, they are also both working under private, corporatised regulatory regimes, and these are interestingly directly interlinked. Thus the Danish scheme called the 'Arla Farm Quality Assurance Scheme' (Arla Foods, 2007) is inspired by the environmental assessments that Fonterra, the New Zealand dairy cooperative, has carried out at the farm level. The two cooperatives have created and managed a number of food safety and animal welfare measures with clear environmental components. The overall goal of these measures is to minimise risks of negative exposure of the company and its products on the markets worldwide, and they are both designed to supplement public regulations or to compensate for the lack of effective public policy. They are typically associated closely with the branding of products and sources of supply – for example in the way that New Zealand products have been characterised as 'clean and green'. These quality assurance schemes are becoming integral to the supply contracts between the dairy company and

the farmer, and this enables the companies to impose common standards for farming practices, and provides a means to exclude the poor performers (which is otherwise complicated for a cooperative organisation).

The urban consumer and a growing urban population is the main market for food products. Urban perspectives dominate this process of branding and re-regulation, not only of the food markets themselves, but also more generally in the way agricultural landscapes are represented as 'countryside' or 'rural hinterland', as places to visit or to settle (Macnaghten and Urry, 1998; Antrop, 2004). Urbanisation has accelerated dramatically in the twentieth century, with an increase in the global urban population from 220 million in 1900 to 2.9 billion in 2000, a 13-fold increase compared with the four-fold increase of the total global population (Zlotnik, 2004). This has been partly driven by a growing rural population that is increasingly marginalised in the industrial production of food, and which has migrated to cities for jobs and a better life.

Urbanisation means consumption of land, usually agricultural land, for new housing, infrastructure, businesses and recreational open space. Such 'urban sprawl', as it is defined by the European Environmental Agency, comprises the low-density expansion of urban areas, under market conditions, mainly into the surrounding agricultural areas (European Environmental Agency, 2006, p. 6). Measured as a percentage of the total land area, the land consumed directly by urbanisation is far below 10% for Europe as a whole, but the nature and location of growth is also affecting agricultural landscapes in a number of indirect and significant ways. First, urban expansion involves much more than the land directly developed in the peri-urban area. Large areas of 'left-over' fragmented open land are used for various recreational or business purposes, and partly abandoned, and function mainly as an investment 'land bank' for development speculators. A diversity of planning measures and 'containment strategies' have been applied to cope with the management of peri-urban areas, from green belts to various zoning systems (Hall, 2002; Millward, 2006), but with the exception of a few examples (see Chapter 12), this seldom involves significant food production.

Second, there is a more discreet and less visible form of urbanisation of the more general countryside taking place in many regions, described as 'counter-urbanisation' (Antrop, 2004; Busck *et al*., 2006). Urban people and urban-based enterprises buy up farm properties for a number of different reasons, which include a desire to experience rural life, livestock and hobby farming, and relatively low land and building prices. In expanding urban regions, and in highly attractive landscapes, counter-urbanisation may dominate the land market, with the result that commercial farming declines and may eventually be pushed out. Counter-urbanisation may – locally as well as regionally – have profound landscape impacts. A well known and extreme example is the

metropolitan region of the north-eastern states of the USA, where a major part of the rural land between the conurbations that stretch from Washington, DC to Massachusetts now comprises second-growth forest, occupied by urban commuters, living on former farm properties that have been abandoned to natural succession (Gottman, 1961).

These two main drivers for change in agricultural landscapes, changes in production systems and urbanisation, affect a large proportion of the agricultural landscapes in developed countries, and it may be useful to see them in combination. These two dimensions are present to some degree in any agricultural landscape. Together with the biogeographical conditions, the specific combination determines the type of landscape, both functionally and structurally.

Figure 1.1 identifies a field of possible landscape conditions, which fall into four broad categories. The first type of combination is the rural, intensively farmed landscape, with a few newcomers coming from urban areas and relatively few residents with urban jobs. It is likely to be a lowland landscape, with relatively good conditions for agriculture. The landscape may be highly specialised and industrialised, and is typically highly integrated into vertical food networks, dependent on world markets for their sales as well as for the energy needed for production. These are typically homogeneous landscapes, with few and highly disturbed natural habitats. Public policy issues include soil erosion, eutrophication and pollution of surface waters caused by pesticides, stock, and various forms of fertiliser, and poor conditions for biodiversity.

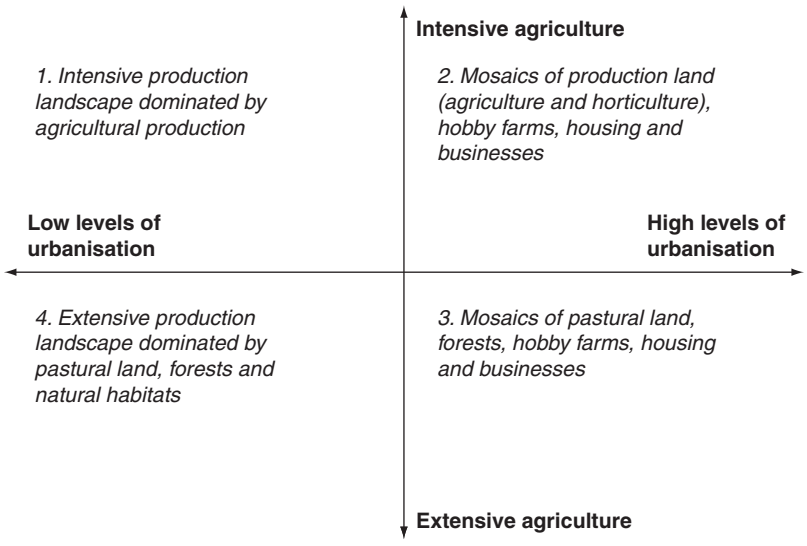

FIGURE 1.1.
Two main drivers of agricultural landscapes – agriculture and urbanisation including counter-urbanisation and general influence of 'urban' investments and 'urban' values.

The second combination is also characterised by intensive farming, but is also highly affected by the local and regional urban economy, in terms of the availability of alternative (non-agricultural) jobs, or as pressure for urban development. The landscape may be affected by urban sprawl intermixed with more or less isolated agricultural units, or it may be mainly characterised by various forms of intensive farming with sharp boundaries. There is often competition between land uses, and agriculture may be under pressure. Common policy issues focus upon containment and delineation of uses, managing conflict between uses (e.g. pesticide application in orchards close to housing areas, or smells or noise from intensive production units), regulating the environmental effects of agriculture, and managing competition for resources such as water. A special version of this is an urban landscape with small patches of intensively farmed lots intermixed with the streets and residential neighbourhoods.

The third possible type of agricultural landscape has extensive farming as the dominant land use but is nonetheless highly integrated with urban systems. This is often a pastoral landscape, with a mosaic of grasslands, abandoned land, woodlots and new urban developments in areas of high amenity. In some regions urbanisation is present in the form of incoming pensioners, second homes and tourism, and often there is some competition in land use and land ownership between farming, housing, recreation and nature conservation. Nature conservation policies to protect valuable habitats against development and agri-environmental policies to maintain extensive agriculture are often applied in these areas.

The fourth category is landscapes with marginal conditions for agriculture and with low levels of urbanisation. Such landscapes are often characterised by a history of frequent landscape changes, with pastures and fields going in and out of agricultural production in response to long-term price cycles in commodity markets, resulting in a fragile and vulnerable local economy. For the more diverse and attractive of these landscapes, tourism and support for the maintenance of habitats and cultural heritage may represent significant sources of income that can be combined with low-intensity agriculture. Other such landscapes may lose agriculture and revert into forest, as has happened already for significant parts of Scandinavia.

These four types or categories of landscapes are schematic: there are many subtle variations and gradations along the two dimensions, between extensification and intensification of agricultural production, and different degrees of urbanisation. However, it is possible to locate all the landscapes introduced in the following chapters within this matrix and it is useful to include the two dimensions in the characterisation of any agricultural landscape. It is also useful and meaningful to have the two types of driving force in mind when considering public policies affecting rural landscapes, since agricultural

change and urbanisation are regulated through distinct and sometimes conflicting types of policy regimes, as we will show in the next section.

Two policy agendas

Public policy of various kinds, including agricultural policy, affects agricultural landscapes in numerous ways, and has done so throughout history (Olwig, 2002; Jones, 2005). In a globalisation context, two international policy agendas are of immediate importance: the market liberalisation agenda and the sustainability agenda. The former is institutionalised through the World Trade Organization (WTO), and is about opening markets to international trade, and other forms of deregulation of the economy. Reform of national agricultural policies, including subsidies and import restrictions, has been high on this agenda, and although some liberalisation has taken place in a number of countries, the level of subsidisation of agricultural production is still high in most of the OECD member states, including the EU as a whole (see Preface).

The liberalisation agenda is typically presented as an alternative and opposite ideology to the various forms of subsidy currently practised. However, it is important to recall that the creation of an open European market has been a major goal from the very start of the European Community (Fearne, 1997). The Common Agricultural Policy (CAP) should in fact be seen in the context of an open European market, as it has been partly designed and developed to avoid negative social impacts of the removal of trade barriers within Europe. This illustrates the point that is further developed in Chapter 2, that the crucial rural policy question for developed countries is not a binary choice between open unregulated trade and highly regulated production, but rather what types of public policy framework are needed to manage the various dimensions of the public interest in the wider biological economy, food sector and rural environment.

Decisions taken within the liberalisation agenda affect producers and consumers of all kinds, from high-level executives in multinational corporations to the individual farm family and the individual resident. However, as indicated in Figure 1.2, a distinctive feature of this agenda is that the policy decisions are taken largely at national and international levels, remote from local communities and landscapes. Hence the scope of action of individual agents – the farmers described in the chapter introduction – is determined by decisions made in centres of power far away from the landscape in which their consequences become expressed. There is typically little connection between the open market agenda and local and regional decision-making, and once trade agreements are made, even national governments lose flexibility of action.

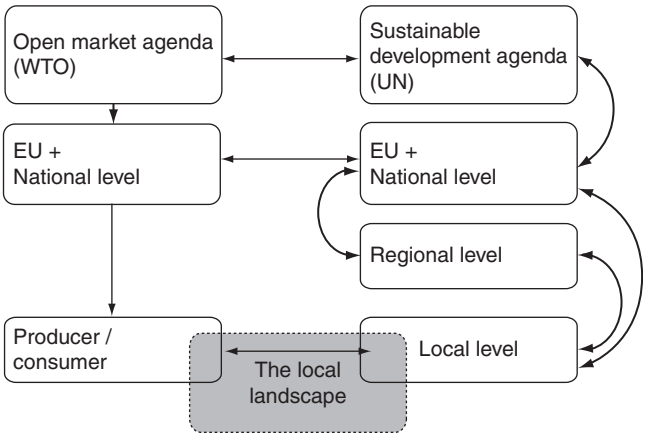

FIGURE 1.2.
Two international policy agendas affecting the local agricultural landscape, the WTO's open market agenda and the UN's sustainable development agenda.

A further critical feature of the market agenda is the way it enables – indeed encourages – the establishment of extensive privately owned corporate networks of production and distribution. These effectively become international policy institutions themselves, through the adoption of particular food technologies and establishment of quality assurance systems (Marsden, 2003).

The second major agenda shaping public policy that affects agricultural landscapes – the agenda for sustainable development – has largely developed in response to the effects of industrialisation and the global market agenda. The UN Conference on the Human Environment, held in Stockholm in 1972, was the first world conference on the environment, and is often referred to as the start of an international agenda for sustainable development (Held *et al.*, 1999; Clapp and Dauverge, 2005). The Brundtland report, 'Our Common Future' published by the UN's Commission on Environment and Development (World Commission on Environment and Development, 1987), and the Rio Conference on the Environment and Development in 1992 are other milestones, making the UN the key institution for sustainability policy at the global level over the past few decades (Figure 1.2). This agenda is widely debated, with a large and growing body of associated literature and increasing numbers of participants – as non-governmental organisations (NGOs), researchers, public officers, journalists and politicians. Growing awareness of the probable consequences of climate change (Intergovernmental Panel on Climate Change, 2007) is of course giving renewed urgency to the debate.

In the context of this book, three dimensions of the sustainability agenda are of particular interest: the way the agenda challenges established public policy focused upon trade and production; the role landscape research may play in discourses associated with the agenda; and the way the agenda directly

affects decisions and behaviour concerning the local agricultural landscape. O'Riordan and Voisey (1998) see sustainability as a moral ideal – like democracy and justice – which no one really wants to oppose. They see it as likely that the 'sustainability transition' – despite the slow rate of change – will create new alliances between the various public regulatory agencies responsible for issues such as food safety, environmental protection, countryside and urban amenity, and land-use planning. These alliances are increasingly also part of wider collaborative networks of power and morality with NGOs and with international corporations (Morgan *et al.*, 2007). O'Riordan (2002, pp. 102–106) suggests seven 'pointers' that can be used to assess how seriously the 'sustainability transition' is taken within public policy and wider alliances: the language used, policy integration, interdepartmental coordination, sustainability indicators, eco-taxation, compatibility of business and environment, and local Agenda 21. Several of these indicators recur as points of analysis in the chapters that follow, and in the final discussion.

The need for integrated analysis – of policy and its consequences for landscape change – are key themes in this volume, and are central to the new emerging field of sustainability science that aims more generally at a better understanding of nature–society interactions. Kates *et al.* (2001, p. 642) pose a number of questions to guide sustainability research, and one in particular is most relevant. They ask what factors determine the vulnerability and resilience of combined natural–social systems in particular kinds of places and for particular types of ecosystem and human livelihood. The agricultural landscape is one such 'particular place', and the focus of this volume. When discussing the relevance of sustainability sciences to landscape ecology, Potschin and Haines-Young (2006) argue for research into 'the sustainability choice space' of different landscapes. They present a conceptual model – potentially used in planning – in which landscape changes over time may be evaluated against environmental indicators in order to identify the set of 'acceptable changes'. This approach represents a direction forward towards a more integrative landscape ecology, which includes social and economic processes in the study of landscape, and the matrix in Figure 1.1 provides one way to envisage the range of types of landscape within a particular biogeographical region, each with differing 'sustainability spaces'.

However, such analyses are by no means straightforward. As we have outlined, the social and economic dynamics of globalisation that shape agricultural landscapes, and the decisions through which they are expressed, originate and become manifest at very different scales – from the global to local, and over different time scales. Neither the regional nor local landscape level is easily located in the market agenda, in particular. In contrast, the sustainability agenda is expressed at all levels – often in ways so that the specific policies are adapted or adjusted to the level on which they should

function. Often (but not always) environmental policies affecting the agricultural landscape – including policies related to water resource protection and consumption, nature conservation, soil conservation, land use and landscape scenery – are implemented at the local level. This means, at least in principle, that the specific policies affecting local producers and users are tailored to the specific conditions. A key issue which emerges throughout the following chapters is the question of how different policy in the two agendas – market and sustainability – can be better integrated across scales, and at their point of practical intersection in the local landscape (Figure 1.2).

It is also crucial to recognise that when the sustainability agenda and the market liberalisation agenda 'meet' in the local landscape, they do not meet in any symmetrical way. There is seldom a balance of power or influence between the actors and their respective agendas, the levels of generality and specificity differ, and respective sequences of decision-making are typically poorly aligned over time. This volume is particularly focused upon better understanding these critical relationships in particular landscapes, under different policy combinations.

Between space of flows and space of place – the globalised agricultural landscape

One way to conceptualise the dynamics and tensions within local agricultural landscapes, both in a globalisation context and as a local system of habitats and a living place for humans, is to utilise Castells' concepts of 'space of flows' and 'space of place' (Castells, 2000). Castells presents a broad model of changing human culture, in which the current phase is characterised as 'The Network Society'. He argues that local economies around the globe are being reorganised into global networks that connect the individual enterprise (such as the farm) with international markets. They are therefore 'extended' in Gray's words (2002) and 'lifted out' of their local context (Giddens, 1990). Such networks are increasingly being interlinked at a global scale, with key decisions concerning the functioning of the networks being taken in different centres around the world. The two farmers introduced at the beginning of this chapter are both linked closely to such global networks, and it is through these networks that their activities and their respective landscapes are increasingly being connected. Castells describes this as the global 'space of flows'. However, both farmers are also concurrently part of a different reality, which is their relationship to the local landscape as a living place, a place where each of them lives their daily life, together with their family, and in more or less close contact with the local community. This is what Castells terms the 'space of place', their local area, more-or-less clearly bounded in respect to the neighbouring landscape.

The processes affecting these two types of space are indeed very different, and it is the balance between their expression and influence which determines in large part how a particular landscape is changing. For example, if a farm is bought and operated by a large corporation, the nature and balance of the functional relationships, the way in which they change over time, and the shape of the sustainability choice space, are all very different to those that will emerge if the farm property is taken over by a hobby farmer. Although there have been a number of attempts to conceptually reconcile the two dimensions of flow and place (e.g. Massey, 1991; Mitchell, 2001; Amin, 2002) we have not found a better way to capture the dynamic relationships between the spatial entity of the landscape and this landscape's relationship to the global system. We return to the question of conceptualising the local landscape in an increasingly globalised world in the final chapter, and we refer to other chapters in this book as examples of how the agricultural landscape is 'positioned' within the global network society, at the point of intersection between place and flow.

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