

## LANDSCAPE CHARACTER AS A FRAMEWORK FOR THE ASSESSMENT OF ENVIRONMENTAL CHANGE

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**Abstract.** In the context of widespread changes in European rural landscapes we underline the importance of considering threats to landscape functions relating to a sense of place, exemplified using the concept of landscape character. Illustrating our argument with examples from the English CQC (Countryside Quality Counts) Project we strongly suggest to move ‘beyond data’ in the strategic assessment of environmental change. Supplementing data on the extent and quantity of changes with contextual information against which to judge “whether these changes matter” in a particular location is vital for the practical use of change data in policy support and environmental assessments.

**Keywords:** Landscape character; Land-use change; Environmental Assessment; Joint Character Area.

### 1. Introduction

Rural landscapes in Europe are changing due to a combination of complex cultural, economic, environmental and social drivers that act at a number of spatial and temporal scales (Palang et al., 2004; Westhoek et al., 2006). This trend reflects the rapid and extensive changes in global land cover and associated degradation of ecosystem services at global scales, highlighted by

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the Millennium Ecosystem Assessment (2005) and Project *Global Land Project*<sup>†</sup>. The changes faced by many rural areas in Europe often manifest themselves through agricultural intensification in favourable areas and the abandonment of traditional land-use practices in more marginal situations (Verburg et al., 2006). In other areas development pressure transforms the landscape so that the traditional distinction between rural and urban is often blurred. Such trends lead not only to a loss in biodiversity (Reidsma et al., 2006), but also to a loss in the diversity and distinctiveness of the cultural landscape.

In the context of environmental security, the current rate of land cover and land use change therefore potentially threatens key ecosystem and landscape values. In this paper we consider the issue of local distinctiveness, and argue that the loss of 'sense of place' that results from erosion of landscape character needs to be considered as part of our wider monitoring strategies (cf. European Landscape Convention (Council of Europe, 2000); Wascher, 2005). Local distinctiveness not only reflects the rich historical and cultural diversity of Europe, but also, with increasing globalization of economies, constitutes a resource that can contribute to directly improve people's well-being by helping, for example, to 'market' different localities and their associated products in the context of tourism or the local and regional labelling of food and other goods (Moore-Colyer and Scott, 2005).

While change-detection methods based on EO (Earth-Observation)-data are being developed and tested at a range of spatial and temporal scales, the spatial and socio-cultural context of these changes is hardly ever considered – even though we need such information if we are to judge whether such changes matter or not. For example, woodland loss or gain can have very different impacts depending on *where* that change is occurring. In this paper we therefore argue that for any strategic environmental assessment, change information *as well* as contextual data is vital for decision making (Warren, 2002). While many of the contributions in this book explore and describe where and how much change is occurring, we assert that as a scientific community we must not lose sight of the question of how to determine whether those changes matter in a specific geographical context. In this paper we show how the analysis of landscape character can help us make progress in this important area.

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<sup>†</sup> <http://www.globallandproject.org/> and [http://www.glp.colostate.edu/report\\_53.pdf](http://www.glp.colostate.edu/report_53.pdf)

## 2. Landscape Character Assessment

The potential that recent advances in data capture, storage and analysis hold for policy development and appraisal have often not been realized in terms of improving the quality of decision making. The problem, we suggest, is not necessarily due to the timeliness or quality of the data products themselves, but rather to the lack of any systematic understanding of the contexts in which the significance of change (or lack of it) can be assessed. Although Warren (2002) has stressed the importance of understanding the spatial, temporal, economic, environmental and cultural context information for scientific studies on land degradation, the issue of context has largely been overlooked in the recent scientific literature.

In order to illustrate how questions of change detection and the understanding of context can jointly be addressed, we describe a case study based on the Countryside Quality Counts (CQC) Project, which has been undertaken for Countryside Agency in England. The project aims to identify how and where landscape or countryside character is changing, and to assess the significance of such changes in relation to the qualities that give the different landscapes of England their distinctive local identities.

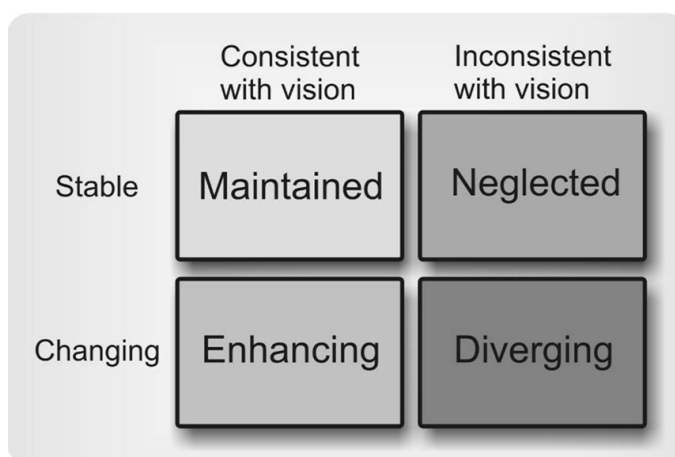
Although the UK Government has long recognised the importance of understanding the nature of countryside change, the 2000 *Rural White Paper for England* (Department of the Environment, Transport and the Regions, 2000) recognised that still more needed to be done. In particular, this policy document stressed the importance of future monitoring, and made a commitment to publish an indicator of change in countryside quality that would take account of aspects such as biodiversity, heritage, and the overall character of the landscape. The case for such an indicator was based on the belief that the linkage between people and their environment needed to be more clearly identified, so that future social, economic and environmental goals become more closely aligned.

The Countryside Agency took up the task of developing this indicator through the CQC Project. At the outset it was recognised that many different ideas were embedded in the original concept of 'countryside quality' as promoted in the *Rural White Paper*, but that a key aspect was the notion of local distinctiveness. The subsequent work built on the earlier character areas initiative promoted by the Countryside Agency, which had resulted in the mapping and description of the 'character areas' of England ‡

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‡ <http://www.landscapecharacter.org.uk/>

The CQC project started from the assumption that since the distinctive properties of the landscape character in each area could be described in terms of patterns and qualities of the elements, such as woodland, boundaries, agricultural land cover, and settlement patterns, then the change in landscape character over time ought potentially to be detectable. The advantage of combining notions of landscape character with the measurement of change was that the significance of change in a landscape element could be judged against the criteria of whether local distinctiveness was being maintained or transformed. For administrative reasons the character areas of England have come to be known as ‘Joint Character Areas’ (JCAs). The CQC project assembled a range of national data sets that could be disaggregated to at least JCA level that could be used to detect change in the elements that contribute to character. The base-line for these data was 1990, and the first period of assessment was for the period 1990-98. Current work seeks to update the assessment for the period 1999-2003. The work showed that for the first assessment period, about 40% of the JCA were stable or showed changes that were consistent with either maintaining or strengthening their character (Figure 1). By contrast about 23% showed marked patterns of change that were transforming or weakening the characteristics that made them distinctive. The remaining JCAs showed change that was less pronounced but which were nevertheless inconsistent with our understanding of their traditional character (Haines-Young et al., 2004).



*Figure 1.* CQC Indicator framework which describes status and trend for each Character Areas of England.

The methodology used for the assessment is best illustrated by reference to some example assessments. The Cumbria High Fells, for example, is a JCA that makes up a large part of one of England’s National Parks. Its distinctive

qualities result from its upland character, and include the extensive tracts of unimproved rough grazing land in the higher areas, with semi-improved and improved pasture and rectilinear fields in the valleys. There are relatively few trees on the exposed higher land, but in more sheltered sites there are extensive areas of ancient, semi-natural broadleaved, mixed and conifer woodlands. Settlement density is low throughout. Analysis of the national data sets that were available for the area suggested that change in the elements that produced its strong sense of place were limited, and so the overall conclusion was that character was maintained.

The Mid-Somerset Hills is a distinctive more elevated area of countryside in SW England, which is predominately pastoral in character. Woodlands dominated by ash and maple are a common feature on the ridge tops and steeper side slopes. Analysis of national datasets for this JCA showed that between 1990 and 1998, significant areas of grassland appeared to have been converted to other agricultural cover types, and uptake of management agreements that would have improved the quality of woodlands or increased woodland cover had been limited. The area was therefore assessed as showing marked changes inconsistent with maintaining the existing character of the area.

For the second CQC assessment the robustness of the contextual information that is used to define character and provide the basis of the judgements made about the significance of change, were improved by an extensive consultation exercise. Drawing upon a range of sources, a set of statements describing the types of change that would help maintain and strengthen the character of each JCA or serve to weaken or transform it, was constructed, and these were tested by exposing them for comment to a range of landscape, conservation and planning professionals using a web-based consultation tool. Consultees were asked to confirm for the JCAs that they were familiar with, the current and future relevance of each proposition, any modifications to them that were necessary to capture the 'situation on the ground', and to add new statements to cover any issues that have been overlooked when the original set of statements had been constructed. Respondents also had to identify the evidence on which they based their comments. As a result, for the second CQC assessment we have an refined and better tested 'vision' for the character of each area, and thus a more robust and acceptable template against which the significance of change in the elements that make up to landscape can be judged. For the update, the terminology used to describe what is happening to each JCA has been modified, and will reflect the nature of the judgement made in to first phase of the project.

Thus on the basis of the changes observed, JCAs will be described as having been either 'maintained', 'enhanced' if they are stable or showing changes that strengthen their overall character, or 'degraded' or 'diverging' if they fail to

show changes that would redress previous loss of character or if they show changes that continue to erode it further (Figure 2).

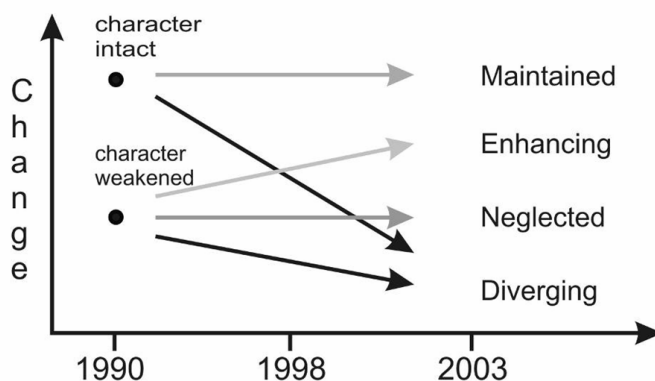


Figure 2. Concept behind assigning the CQC Indicator to JCA.

### 3. Contextual Data for Environmental Assessment

Although designed to address a particular national issue, the CQC project is of interest more generally because it shows that an effective monitoring programme has to go ‘beyond data’ to include the systematic construction of a contextual framework that can be used to make judgements about the significance of any changes identified by the monitoring process. The study shows how the notion of evidence can be expanded to include both a set of quantitative indicators and the more qualitative values or visions that people bring to the table when confronted with the question of whether a particular environmental change matters or not. The approach is, we suggest, relevant to a wider range of applications beyond the assessment of landscape character, and could be used to help monitor environmental security issues more widely. This is particularly the case where the consultation process is used to identify and quantify the limits or thresholds of acceptable or desirable change for the environmental parameters under consideration. A shortcoming of the present CQC Project was the fact that consultation was limited to ‘professionals’. The expansion of the consultation exercise to include a wide range of publics would clearly enable a richer and more nuanced assessment to be made. The goal of such work should not be to prescribe what kinds of change are appropriate or acceptable, but to provide a more systematic body of evidence that can inform debate about the implications of environmental change for different groups within society.

The need to go ‘beyond data’ to the ‘construction and identification of context’ can be illustrated by reference to the recent development of a number of policy support tools. Methodologies for Strategic Environmental Assessments (SEA) are, for example, somewhat similar in character to Environmental Impact Assessments (EIA) except that they are meant to ensure that the environmental implications of decisions are taken into account in a more strategic way. They also emphasise the need to look for alternatives, ensure early participation of stakeholders in decision making, and subsequent monitoring and biodiversity protection activities (Sheate et al., 2005). SEA’s have been required since 2004 under EU Directive 2001/42/EC (EC, 2003), and are currently being implemented in the member states. A key issue is to find ways of monitoring and assessing the significance of the environmental effects a given implementation of plan or program. The SEA-Directive stresses the importance of using sufficient baseline information to provide the basis for predicting and monitoring environmental effects. In the UK, SEA guidelines (see ODPM, 2005) suggest a number of questions that need to be answered using such data for each selected indicator, including:

- *“How good or bad is the current situation? Do trends show that it is getting better or worse?”*
- *How far is the current situation from any established thresholds or targets?*
- *Are particularly sensitive or important elements of the receiving environment affected, e.g. vulnerable social groups, non-renewable resources, endangered species, rare habitats?*
- *Are the problems reversible or irreversible, permanent or temporary?*
- *How difficult would it be to offset or remedy any damage?*
- *Have there been significant cumulative or synergistic effects over time? Are there expected to be such effects in the future?”*

Although quantitative data produced by monitoring programmes can help to answer such questions, ‘data’ alone are clearly insufficient to resolve them fully. All of the questions noted above imply some understanding of the visions or values that different people or groups bring to the assessment of change, and so require that the evidence base be expanded to include such intelligence. Similar points could be made in relation to other decision support tools such as sustainability appraisals, EIA and Quality of Life Capital Assessment (Potschin and Haines-Young, 2003).

The kind of contextual information generated by CQC can also be of assistance in developing targeting strategies for policy. For example, following moves in the EU to decouple farm subsidies from production incentives, agri-environmental schemes have been implemented to deliver a range of

‘environmental goods’. In England guidance has been published to encourage land managers to select scheme options that are appropriate to the environmental needs of their local area. Contextual information of the kind assembled by CQC can be used to further refine these guidelines, and can provide a framework for monitoring the extent to which the schemes have been successful in maintaining or restoring particular environmental qualities.

As these examples demonstrate, key component of the contextual frameworks that need to be developed to fully utilize SIA and other policy targeting and monitoring tools, is a better understanding of the concept of the limits of acceptable or desirable change. This assertion is supported by the fact that questions about environmental limits, and their implications for policies related to natural or environmental resource protection, have emerged as an important focus in recent discussions of how the goals of sustainable development might be achieved (Haines-Young et al., 2006). Following publication of the Millennium Ecosystem Assessment (2005), for example, it is now recognized that not only do we need to view ecosystems in terms of the range of benefits to people, but also to better understand how pressures, such as pollution or over-use, may impact upon them and diminish the level or quality of the benefits that they provide. A review of the recent literature on limits and thresholds suggests that while the definition of an environmental limit may be based on the biophysical properties of a natural resource system, its identification also depends on the way people value the outputs from it. Increasingly an important aspect of the contextual information that we require for effective policy development and appraisal, is to understand how people and groups in society make the judgment that that given the scale of actual or potential environmental change, a critical point has been reached and that the reduction in benefit derived from natural resource systems is no longer acceptable or tolerable. It is likely that future work on constructing the kinds of conceptual framework we need to implement SIA and other assessment tools will grow out of a better understanding of notions of ecological integrity, and resilience, and the capacity of ecosystems and indeed whole landscapes to absorb change.

#### **4. Implications for Environmental Assessment**

While the concept of environmental security covers a very wide variety of issues, as this publication emphasises, the threat to ecosystem goods and services and the support they provide for the well-being of people is an important focus for current work. In order to take this research agenda forward, an understanding of the link between land cover and land use change and their impacts on ecosystem goods and services is now pressing.



In general the literature suggests that we have a good conceptual framework for describing and understanding the processes of land-cover and land-use change. A number of the chapters in this book show that in the scientific realm we are able, for example, to measure, document, monitor and model many aspects of these changes. By contrast, in the policy arena it seems that much less progress has been made. It is apparent from the literature that studies often overlook or lack the kinds of information that would allow us to go beyond merely monitoring change to making judgements about its wider significance.

The CQC Project illustrates the kinds of additional information that we require to undertake effective policy development and appraisal more generally. The description of landscape or countryside character in England has been used in this work as a body of contextual information that helps us understand what gives different landscapes their 'sense of place'. As a result, we can take the outcomes of monitoring activities that focus on the individual elements of landscape and make more holistic judgments about the changes they exhibit based on the implications for maintaining local distinctiveness. Following Hamilton and Selman (2005) the study illustrates how it is possible to blend national datasets with local knowledge and thus help achieve an approach to rural policy delivery that is less strictly linked to administrative boundaries and is more sensitive to countryside character, natural dynamics and time depth of landscapes and communities. The approach can be applied generally, and could also be relevant, for example, in understanding the implications of land cover change at European scales using the dominant land classes suggested by the European Environment Agency (EEA, 2006) as part of its environmental accounting initiative.

We acknowledge, however, that landscape or countryside character is but one environmental issue amongst many that we need to consider in relation to discussions about environmental security. Nevertheless, the experience this case study provides is important because it illustrates that if systematic contextual information is available, it is possible to go beyond reporting that environmental change has occurred to explain to people why such changes matter. This work suggests that the development of concepts and tools to help us understand how people view and value environmental or ecological integrity at different geographical and temporal scales is an essential focus for future research.

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