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Evaluating the demands of Green Infrastructure Development: People, Policy and Practice

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Introduction

The past decade has seen major development in green infrastructure research and planning practice. The principles of green infrastructure, first articulated by Benedict & McMahon (2006), have permeated into landscape planning in the UK prompting responses from national, regional and local government to the desire for more sustainable and multi-functional landscapes. However, in England, problems are still apparent in determining the focus for green infrastructure planning in particular contexts. There is considerable difficulty in relation to the existing restrictions of landscape policy and legislation. National landscape designation, including SSSI's (Sites of Special Scientific Interest), is one area that lacks flexibility and places restrictions on landscape change in order to protect the status quo of sites.

The need to devise evaluation approaches to help resolve this situation will form the main argument of this paper. Using the example of green infrastructure planning in England this paper will use a model developed in the north-east of England to evaluate a case in Cambridgeshire. The levels of negotiation and compromise needed to develop green infrastructure will be discussed. The pressures placed upon landscapes from a planning, development, and conservation perspective are often contradictory; issues of appropriateness and project focus are of key importance. A collaborative approach and considerable compromise may be necessary in order to promote the multiple benefits of green infrastructure development and in order to allow implementation to take place.

Background: Current green infrastructure developments

Over the last decade and particularly over the last five years major advances have been seen in green infrastructure thinking and planning (Mell & Roe, 2007). The delivery of projects has raised the profile of green infrastructure thinking thanks to the influence of organisations like Natural England in the UK (Natural England, 2009; Countryside Agency, 2006) and the Conservation Fund in the USA (Benedict & McMahon, 2006, Weber *et al.*, 2006). This process of mainstreaming has emphasised the values of landscape connectivity, multi-functionality, strategic development, multiple benefits, and partnership working. Green infrastructure planning has to some extent enabled a more holistic and sustainable long-term planning process to be developed that is applicable to local, regional and even national scales (Kambites & Owen, 2007; Landscape Institute, 2009).

The development of green infrastructure appears to have expanded quickly compared to other green space planning ideas (Benedict and McMahon, 2006). While evidence supporting the *value*¹⁰ of green infrastructure is still being gathered, evaluations (Williamson, 2003; Beatley, 2009; Blackman & Thackray, 2007) highlight its value in creating a multi-functional approach to landscape planning at a number of scales. Positive assessments relating to urban greening projects (Akiki & Kunihiro, 2005), strategic and holistic urban planning models (TEP, 2005), sustainable transport networks (DCLG, 2009), and a more in-depth understanding of the interaction of human behaviour and ecosystem process (Gill *et al.*, 2007) have all been used as evidence that green infrastructure planning can help to meet long-term sustainability targets (Mell, 2009).

Current green infrastructure research focuses on meeting the short-term needs of landscape regeneration and the longer-term targets addressing climate change adaptation and resource sustainability (Dapolito Dunn, 2007). How these objectives are supported by landscape planning policy is more difficult to identify. This is important because although the criteria for planning green infrastructure can now be established through the theory and strategies discussed in the literature, existing policy provides its own boundaries and each landscape is also constrained by processes and limits of its own (European Communities, 2008).

Goals and Objectives: Integrating green infrastructure into planning practice in the UK

UK planning policy is now identifying and legislating for green infrastructure. Regional Spatial Strategies in England, Green Infrastructure Strategies, and local government initiatives have all identified the value of green infrastructure for landscape enhancement. The UK Government (ODPM, 2005; DCLG, 2009; DETR, 2000) along with Natural England (2009) and the Landscape Institute (2009) has developed evidence supporting the incorporation of green infrastructure planning in policy. Most recently, changes to Planning Policy Statement (PPS) 12: Local Strategic Planning and the proposed PPS for Eco-Towns have identified green infrastructure as a method of increasing the long-term sustainability of a landscape whilst simultaneously protecting its ecological and social values, particularly at regional and sub-regional scales.

Increasing numbers of designated areas and more planning legislation in England has however meant that planning has become a very prescriptive process reinforcing the need to meet the criteria outlined within policy rather than the needs of a location (Cullingworth & Nadin, 2006). This in turn has meant that those involved in planning have found difficulty in implementing their objectives. Some kind of compromise is therefore needed between meeting the focus of planning policy and

¹⁰ Values here relate to the ecological, social and economic benefits. Work currently being developed in Portland (USA) and in Sheffield (UK) is expanding the research on economic evaluation relating to stated-preferences vs. actual preferences of Green Infrastructure resources.

targets and the development of green infrastructure to address the aspirations and needs of local communities.

In the past the use of planning legislation and landscape designations has protected landscape resources whilst enabling some development to occur. But the restrictive nature of some policy legislation¹¹ has also allowed bodies to have a decisive influence on the planning process. This can, and has, led to a delay in project implementation and an increased dialogue between planning authorities and government agencies¹². Thus planning authorities become cautious when identifying green infrastructure opportunities because of procedural difficulties and because they are unsure whether such proposals will gain legislative and political support.

It is clear from this picture that there are a number of difficulties presently being experienced by those wishing to implement green infrastructure planning. Further development of evaluation and decision-support tools is needed. Some such work has already been carried out and this paper reports on an investigation to clarify where the key problems lie using a model originally developed with stakeholders in north-east England.

Study Methods: Green infrastructure evaluation model

Davies *et al.* (2006) developed a collaborative GIS scenario model approach to test the appropriateness of green infrastructure development. Using areas in the north-east of England potential green infrastructure planners were asked a series of questions relating to the resource base, policy context, funding, location, and availability of data all of which were used to identify whether a green infrastructure project would meet the ecological, economic and social needs of a site (Figure 1)¹³.

By outlining the broad spatial vision and the delivery focus, the landscape context, the scale of development, location, and the planning regulation or restrictions, the model provided a systematic basis for discussion. The process used a collaborative feedback system to develop the questions and criteria used in the GIS examples. The questions from this model were used as the basis for a *post facto* examination of the case of Ely Country Park, Cambridgeshire. The objective of this was primarily to evaluate the demands of green infrastructure planning by using this north-east model to assess the success of the process carried out in the Cambridgeshire case.

¹¹ The legislation pertaining to Minerals (MPS1 Planning and Minerals) and Coastal (PPG20 Coastal Planning) regions are examples of heavily restrictive planning policy in England.

¹² The formation of Natural England from English Nature, the Countryside Agency and the Rural Development Agency is one example where a number of policy areas were brought together in one agency providing it with a greater authority to enforce legislation. Natural England is an independent public body that is funded by the UK government and is the government's national advisor on the natural environment.

¹³ Further work of this nature has since been conducted by the North-West Green Infrastructure Think-Tank, Cambridgeshire Horizons & LDA Design (2009/10), Maryland Department of Natural Resources, and the Conservation Fund.

Figure 1. Questions for Green Infrastructure Planners

- What green infrastructure elements must be protected?
- What elements should be changed in character or enhanced?
- Where is there a need to create new elements and what type should they be?
- Where should the development of grey infrastructure be integrated with GI?
- Which elements should be linked together?
- Which elements are possibly tradable to achieve net environmental gains in both an infrastructure and qualitative sense?

(Source: Davies, *et al.*, 2005)

As a project of strategic importance identified in the Cambridgeshire Green Infrastructure Strategy (Cambridgeshire Horizons, 2006) Ely Country Park is an ecologically and socially important area covering 78-hectares in the urban-fringe. It encompasses six individual land and water areas and is designated nationally as a geological and biological SSSI, and on a regional basis as a County Wildlife Site (CWS). The site is also one of the few transition landscapes between the urban fabric and the wider Fenland countryside.

Despite obtaining political will and financial support at the District and sub-regional scale, those promoting the proposals for Ely Country Park have faced difficult planning issues. These relate to population¹⁴ and economic growth and the restrictions placed upon development by Natural England, the Wildlife Trust and local environmental groups in light of the SSSI designation. Despite having the support of District and County politicians, discussions over the proposals have been fraught with disagreement. An evaluation of the process at Ely was made based on four key objectives developed from the questions in the north-east study. The following summarises the main findings from this analysis.

Results & Analysis: Ely Country Park Green Infrastructure Development, East Cambridgeshire, UK

Objective A: What green infrastructure elements must be protected? Ely Country Park comprises a number of land units some of which are designated as SSSI and a CWS. Consequently, the Roswell Pits and Ely Beet Pits house a number of nationally and internationally important plant and animal species which are found, nest or breed in the park's boundaries. Natural England is designated the competent authority for managing the area and can delay or fine anyone for activities within it.

¹⁴ The population of Ely is set to rise by 41-65% or between 4,000-11,000 (East Cambridgeshire District Council Draft Core Strategy DPD, 2006).

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Objective B: What elements should be changed in character or enhanced? Local pressure groups along with Natural England have actively campaigned to minimise any development in the Country Park boundary. They feel that the ecological integrity of the site will be compromised with any additional construction works. Moreover, the rarity of several National Indicator (NI) species (i.e. water voles, booming bittern, and bats) has placed additional constraints. Assessment is needed of cumulative or direct impacts landscape change may have on these species.

Objective C: Where is there a need to create new elements and what type should they be? The Park project was developed at a sub-regional (Cambridgeshire) and District (East Cambridgeshire) level to provide much needed opportunities for outdoor activity and play. The City of Ely has a deficit of accessible natural green space and the Park is seen as a key strategic project in providing better health and well-being.

Objective D: Where should the development of grey infrastructure be integrated with GI? Its location in the urban-fringe provides the Park with the opportunity to provide accessible routes within the city and the wider countryside. However, the designations mean that any major works (e.g. cycle path or visitors centre construction) must be planned under Natural England and Wildlife Trust guidelines. This may not allow integration or use of the most appropriate locations for sustainable movement or play as all locations are subject to several stages of revision.

Objective E: Which elements should be linked together?

The need to provide accessible and functional spaces is readily apparent in Ely. The co-location of play equipment and visitors facilities was deemed central to the development visions of the site. Facilitating additional access in one location was therefore proposed as a method of isolating or targeting visitors into one area and thus lowering the cumulative impacts of more sensitive areas. This restricts environmental education and community access to areas of high ecological value which could be integrated in Ely.

Objective F: Which elements are possibly tradable to achieve net environmental gains in both an infrastructure and qualitative sense? Environmental losses are regarded as an unacceptable impact of development. All construction works are therefore being programmed to limit access to more sensitive areas. The integrity of the site is therefore seen as a primary, and achievable, objective of this process. By assuming that most visitors will remain within a relatively bounded area close to car parking, visitor facilities, and children's play equipment, the wider Country Park will remain below its foot fall capacity. The improvements being made are therefore aiming to provide additional facilities whilst maintaining the valuable spaces and habitats that have been developed over time.

Analysis of the situation with regard to this case study using the four key understandings set out above shows that Ely Country Park has been subject to a

number of planning and implementation difficulties. Despite an acknowledgement of the value of green infrastructure in the District and the Cambridgeshire sub-region by those interested in promoting green infrastructure planning, the potential of this Country Park to play a key role in green infrastructure development has been thwarted by the pressures resulting from the existing landscape designations. In spite of consultation at every stage of the visioning and programme development, there has been a failure by a number of parties to achieve a good understanding of the potential provided by the landscape in this context; in particular in relation to the value that this site has for strategic green infrastructure thinking.

Discussion and Conclusions

Despite an increase in research examining the value of green infrastructure planning there are still a number of issues that remain unclear in relation to the translation of green infrastructure principles into the development of new resources. Taking the theory into practice throws up a number of problems that are critical to successful implementation. The case study examined here shows that there is potential for difficulties to arise in relation to the enforcement of existing landscape designations. To some extent there has been a failure in building a collaborative vision and strategic thinking and the local authority has been thwarted by those with responsibilities for upholding nationally-significant site-based landscape restrictions. This situation is perhaps particularly interesting because it might be expected that a national agency would be more concerned with the wider strategic thinking than the local body; whereas the opposite appears to be true. It shows the potential difficulties in implementing green infrastructure development in a country such as the UK with strongly protectionist landscape legislation but also where the system requires the involvement of many stakeholders and statutory consultees at both national and local level in the local planning process.

This case study also shows the importance of the assessment of the landscape context (and any relevant legislation) at the inception or visioning stage. The scenario model proposed by Davies *et al.* (2006) highlighted the importance of bringing together statutory and non-statutory bodies to discuss the issues and benefits related to a particular site and it would appear that this is the most appropriate stage for negotiations and possible compromise to be discussed. It is also the most appropriate time for planners to present a number of green infrastructure options for discussion which could foster more effective partnership working between all stakeholders in this process.

A collaborative planning process where compromise is regarded as likely is important if the interests of all groups are to be upheld and successful green infrastructure plans negotiated. Models may enable a framework to be developed that addresses many of the difficulties identified by those trying to take green infrastructure theory into practice. The Davies *et al.* (2006) model was commissioned by a consortium of stakeholders in the region led and primarily funded by Natural England. The case study in East Cambridgeshire indicates a

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failure by national agencies to learn from work carried out in one part of England that might have been usefully applied to planning in another. It perhaps indicates that information gained from the experiences of green infrastructure planning implementation is still fragmented despite the theory and principles being embedded with government initiatives at many levels.

This paper has argued that the use of a scenario process can provide a forum for discussion but also noted that the dialogues developed between key partners and statutory bodies are central to achieving green infrastructure planning. Two key points are identified here:

- (i) There are difficult and sometimes sensitive decisions to be made but tackling these can lead to the development of innovative green infrastructure planning and collaborative agreements. The UK is commonly regarded as protectionist in relation to planning policy, but green infrastructure planning could provide a way to bring in a new and more positive planning approach to strategic landscape development. Conversely, the failure of such processes can be highly frustrating to the parties involved both with regard to the environmental designation system and the role of the enforcement agencies.
- (ii) More attention is needed to ensure that lessons learned in the implementation of green infrastructure planning are disseminated to all stakeholders in the process and also that such stakeholders also have adequate levels of understanding in the key issues to ensure well-informed dialogue takes place.

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