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Sustainable landscape design; key ideas for effective implementation

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Abstract

This paper forms part of wider research looking at pioneer landscape strategies across Europe, examining the extent to which low carbon, sustainability and spatial quality can be delivered effectively on urban and strategic scale, and covers examples from the 'Landscape Observatory' (Spain), the 'Room for the River' and 'New Dutch Waterline' (Netherlands), and the 'HS2/HS2LV' project (UK). This paper presents the Netherlands and the UK case studies, illustrating effective ways where the key issues of low carbon and quality of space are integrated in the design framework and the impact this has on the decision making. The case studies have shown that effective implementation requires visual communication and an in-depth understanding of how the concepts of sustainability and spatial quality are expressed. Policies, and legislation are also considered significant for landscape based developments.

Keywords: sustainability; low carbon; climate adaptation; landscape design; spatial quality

1. INTRODUCTION

This paper investigates the project process and implementation practices of two case studies in the UK and the Netherlands, exploring innovative approaches that lead to best practices and successful sustainable landscape schemes. Examining examples which have dealt with low carbon and spatial quality, it demonstrates how such issues are interpreted on a large scale and the impact on the landscape. The Netherlands case study consisted of two national landscape projects, the Room for the River and the New Dutch Waterline, and shows how water safety, hydrological efficiency and sense of place equate to low carbon and design quality. The Room for the River is a climate adaptation scheme addressing flooding, while the New Dutch Waterline aims to create new uses for the old defense line of the Netherlands preserving the historical and environmental characteristics of the area. The HS2/HS2LV, UK's major infrastructure project, demonstrates the contradiction between the plans developed for a railway engineering project (HS2) and the proposal for the establishment of a 'symbiotic relationship between the landscape' [1], known as HS2LV.

The chance given to this research the opportunity to observe and evaluate innovative landscape schemes has resulted in the identification of effective processes that improve environmental elements and communication methods in strategic schemes. The way the key issues of low carbon and spatial quality can be embedded in regional strategies and the importance of visual communication have been examined. As Stephenson [2] states, 'presenting landscape as 'space' has a long pedigree in assessment practice, but conveying its

rich and messy place-values is still a rarity in practice'. Literature has challenged the interpretation of low carbon questioning if this is based on activities, lifestyles and voluntary behaviour change or policy frameworks that are based on regulatory force [3]. The acceptance of the variability of its interpretation in a European and international level [4,5] highlights the flexibility adopted by the landscape projects. Spatial quality is also unclear as a concept particularly since it relates to many disciplines. For some, quality of space should satisfy the expectations of the community [6,7], while for others it speaks about elements of spatial indications [8]. The paper illustrates the potential of embedding these key issues in regional landscape strategies and presents successful ways for their delivery.

2. MATERIALS AND METHODS

This study based on the regional landscape projects intends to explore, identify and communicate the ideas of a sustainable landscape community. Using the innovative case studies presented above the paper aims to reveal key ideas and effective ways that a sustainable landscape plan can be achieved on a strategic scale. The research methods used include field visits, interviews, observations and drawing examination in order to find out how the landscape ideas, low carbon and spatial quality concepts have been implemented. During the field visits at the live projects the researcher observed the project process, collected plans and maps, and interviewed key stakeholders involved in the schemes.

2.1 Two national schemes of the Netherlands

The Room for the River is a climate driven strategic landscape scheme, implemented to address hydrological efficiency due to increased rainfall and rising sea levels. It is a national programme, developed in 34 locations across the Dutch landscape (Figure 1). The significance of a landscape adaptation programme considering water safety at a large scale, dealing with sense of place and future sustainability makes an excellent example for the purposes of this research. Room for the River extends across the whole country covering urban and rural locations, demonstrating that sustainable areas can be successful at a wide range of landscape characters.

The New Dutch Waterline consists of approximately 60 different fortresses across the Netherlands (Figure 2). It is based at the old military defence system, originally designed in the 19th century, able to enable controlled inundation through sophisticated landscape engineering. The goal of the scheme was to preserve and revitalise the historical landscape, enhancing community engagement, sustainability and quality of space.

2.2 An engineering approach and a landscape vision for the UK's major new railway

The HS2 and HS2 Landscape Vision (HS2LV) case study explores how low carbon and spatial quality landscape strategies can raise the profile of the region supporting social and economic growth. HS2 is a high-speed railway (Figure 3) aiming to link London, Birmingham, East Midlands, Leeds, Sheffield and Manchester, while HS2LV proposes to widen the conceptual and territorial scope of the high-speed line based on a broader way of dealing with major infrastructure. HS2LV aims to transform a linear engineering project –such as HS2– into a sustainable innovative approach attracting local, regional and national interest, and enhancing social and economic aspects of the region. The communication role that visuals play in the way a message is conveyed in strategic schemes will be also presented in this paper.



Figure 1: Map presenting all the 34 locations where landscape projects of the 'Room for the River' programme were developed.
 Source: official document—collected by Author from Rijkswaterstaat, July 2015.



Figure 2: Left: Map of the 'New Dutch Waterline' landscape scheme showing the locations of the fortresses Right: Showing the whole defence line, the locations around the fortresses that are and are now regenerated open areas.
 Source: public material—collected by the researcher from Water museum, the Netherlands, July 2015

3. RESULTS AND DISCUSSION

The case studies have developed individual processes through the various conceptual ideas of the landscape projects, generating a richness of interpretations and methods to make a project successful. The governmental and political commitment to design quality and environmental stability is shown by the economic support, provided to the schemes, creating a political agenda that embeds such key issues in regional design. The paper argues that a new mechanism, focusing on the integration of ideas such as low carbon and sense of place, will have a potential impact on governmental values as well as the transformation of the project's delivery and outcome [9]. Evidence shows that policies and legislation have significant impacts on the implementation of strategic schemes and therefore the ability to develop a range of processes integrating social, environmental and economic elements through landscape design is important.



Figure 3: Plan for phase 1 (London–Birmingham) and phase 2 (Birmingham–Manchester & Leeds) of HS2 route.
Source: Department for Transport, UK.

3.1 Hydrological efficiency and quality of space

Data collected during the case studies demonstrate a great diversity and richness in the way design quality, water safety and ecological elements are interpreted in the schemes. Both interviews and observations reveal that these terms might be ambiguous, but can be uniquely interpreted by the project team in a way that suits the vision of the scheme and addresses the needs of a specific area. Examples extracted from the examined case studies, such as the project of Noordwaard (Room for the River), form an environmental and popular for the community landscape design.

Noordwaard (Figure 4) is developed as a natural area able to face the challenge of water level rise, while at the same time creates an environmental friendly and natural space. The project can accommodate cycling and walking routes, boat cruises and engage with the community enhancing climate awareness. Evidence collected during the case study has

revealed that the focus on water safety, agriculture, inhabitants and spatial quality at this location were priorities of the Netherlands secretary of state. The creation of a nature network, recreation opportunities, strong identity for the natural park Biesbosch (Natura 2000), located in the area, and preservation of the historical and cultural structures of Noordwaard such as the Fort Steurgat, have secured the development of a significant project considering both environmental stability and sense of place (Figure 5). Key steps in the successful implementation of the scheme were the governmental support as well as the dissemination of the aims with the public, which supported this ambitious development.



Figure 4: Noordwaard landscape project. The masterplan illustrates the area of development, the water, agricultural areas and mounds where the housing has been established.

Source: Annika Hesselink.

The second national scale scheme of the Netherlands, New Dutch Waterline, also deals with ecological soundness, aiming to preserve the landscape while creating new uses for the existing fortresses across the old defense line. The scheme has transformed the existing fortresses into areas of cultural restoration, touristic sites, entertainment venues and natural areas. A successful example is the Fort Werk aan't Spoel (Figure 6) which preserves the former military elements, bunkers, bomb-proof buildings and old inundation locks. The regeneration of the landscape and the creation of new uses gives the opportunity to locals and visitors to find out about national history, while enjoying a sustainable and beautiful landscape. The new fort house, shown in Figure 6, operates as a restaurant together with an outdoor landscape amphitheatre both taking inspiration from the past monuments, transforming a historic area into a social space, offering a wide variety of indoor and outdoor activities. Having become an attraction in the New Dutch Waterline, Fort Werk aan't Spoel offers a combination of nature and social engagement while the same time preserving a historic landscape for the Netherlands.



Figure 5: Noordwaard landscape project. The visualisation demonstrates the creation of an environmental friendly and quality space, where activities engage the community enhancing climate awareness. Source: West 8.

The national scheme of the New Dutch Waterline aimed to address hydrological efficiency, in a different way to the Room for the River, by preserving and improving the existing land around the fortresses. Spatial quality was also a significant element in this scheme, but it is identified as an idea of preservation, cultural enlightenment, touristic opportunity and celebration of the historic legacy. Therefore, it can be suggested that the interpretation of the low carbon and spatial quality concepts is flexible, aligning with the vision of a strategic scheme. But the engagement of the community, the establishment of a project team that has the support of the legal entities in each country and the integration of key ideas in the project process results to better integration of such concepts in the landscape design, creating sustainable and quality spaces.



Figure 6: Fort Werk aan't Spoel. Old and new development combines historical and leisure areas. Source: Rob't Hart (Muilwijk, 2015).

3.2 Effective communication of the landscape vision enhances successful implementation

This paper suggests that effective visions are conveyed through design and drawings; and, therefore, the establishment of a landscape narrative that merges in the landscape and the city is an important factor for the integration of issues such as low carbon and spatial quality. Exploring the proposal for the high-speed railway line (HS2) and the HS2LV, a research project that offers an alternative development to the engineering scheme, this paper has extracted important elements regarding the communication of a landscape vision. HS2 was initially focusing on a linear engineering scheme where the railway line, due to current project structure and policy, was going from the macro scale of the scheme right down to a very detailed level. HS2LV proposed that a narrative and a strong design concept for low carbon lifestyle will benefit the implementation of the scheme and engage the community. During the project development, it was revealed that the HS2LV drawing (Figure 7) managed to give a series of exciting possibilities for the region, without micro managing specific spots and areas in the land. Presenting land values, cultural and social characteristics and enhancing economic stability, since it highlights the existing valleys and environmental areas, Figure 7 became a communication tool for the landscape vision of HS2 in West Midlands (Phase 1 – Figure 3).

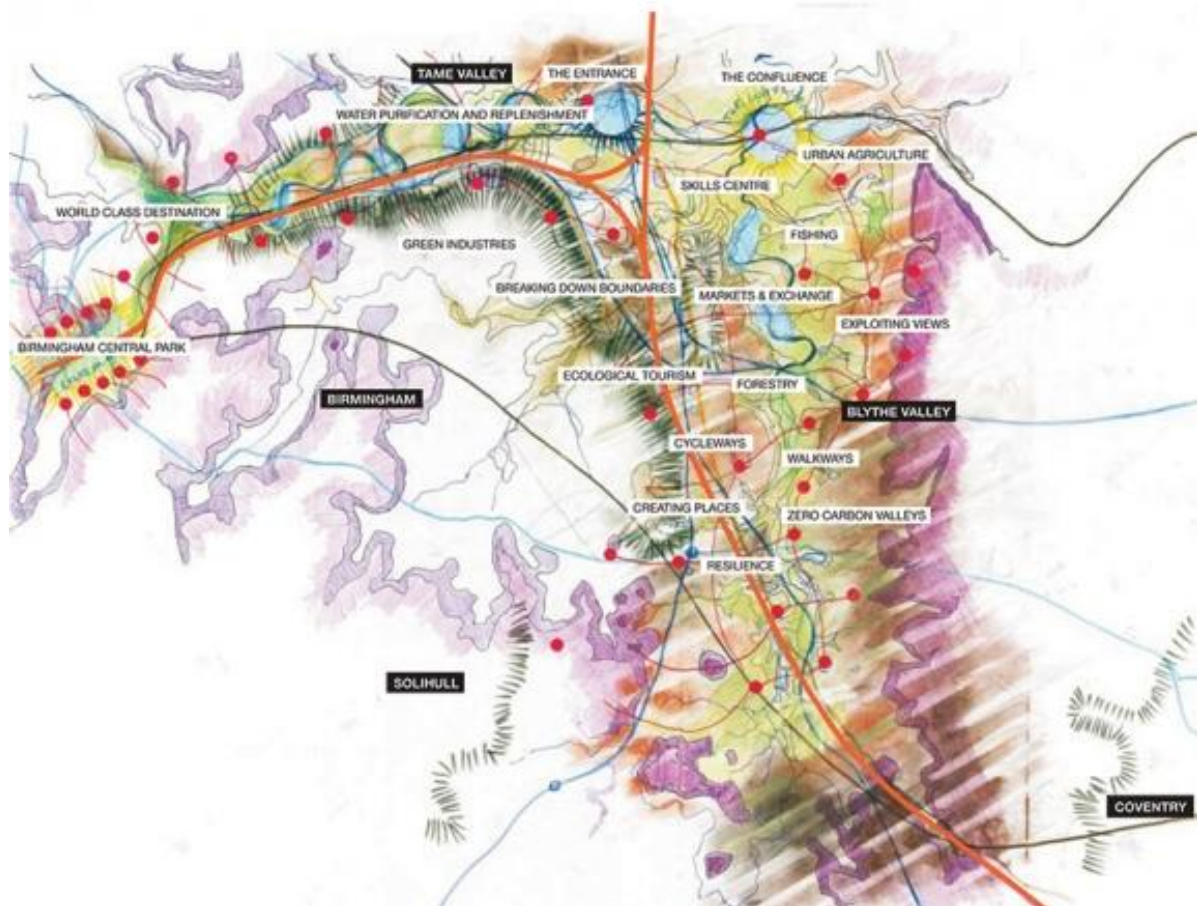


Figure 7: Drawing created to reveal the landscape identity and illustrate an iconic landscape for HS2LV proposal in the route between London-Birmingham. The drawing illustrates the railway line, the valleys and environmental areas of the region as well as the high points with significant views. Source: Kathryn Moore personal archive.

Interview and case study evidence has revealed that the drawings often play a key role in the communication of the project's narrative, illustrating key issues such as spatial quality and sustainability in a way better suited to the audience. HS2LV using a series of drawings and visuals was able to communicate a vision for the landscape, engaging communities and changing perceptions for the impact of the new railway line in the region. It is considered significant for the governmental policy of the UK, demonstrating a different image of the region and integrating environmental and social ideas for the city of Birmingham and its surroundings through landscape design. Data collected during the case studies suggest that a landscape vision needs to be presented visually as well as in text in order to result in better communication of the concept. Building a vision through drawings, as happened with HS2LV, allows us to 'materialise' the key ideas, creating various interpretations depending on the concept and character of the landscape strategy. Establishing a low carbon and quality landscape vision and communicate these ideas to the broader audience is not easy, but this study aligns with Lutz [10] who suggests that it is possible to describe an attractive and sustainable place and suggests that the most effective visions are conveyed through design and drawing.

4. CONCLUSIONS

The case study investigation has revealed that effective implementation of a sustainable and quality landscape project depends on a series of different processes. The concepts of spatial quality and low carbon are often flexible in their understanding and therefore easy to be interpreted in various ways depending on the aim and vision of the strategic development. However, their early integration in the project process has substantially beneficial results for the scheme. The development in these pioneer projects of surrogates such as water safety and ecological soundness has shown that the key issues of a strategic scheme can equate with something more tangible depending on the location and project aims. This method, together with the creation of a landscape vision improves their spatial understanding and therefore their delivery on a large scale.

Findings on the role of drawings and visuals during the project process suggests that pictorial forms can be a major communication tool. Their effective use from the early stages of the project development shows that low carbon and quality concepts can be communicated in a different way, creating a powerful landscape narrative. Identifying the lack of articulation of the landscape concept in legislation, the study highlights that policies act as a way to enhance the principles of design, low carbon and spatial quality, and persuade politicians and civil servants to consider the vision and the outcomes of each landscape scheme from the very beginning, resulting to a more sustainable and quality landscape scheme.

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