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CAN GREEN INFRASTRUCTURES PROMOTE THE URBAN RENAISSANCE AND AID URBAN SUSTAINABILITY?

Theme: Sustainability and the different approaches to urban planning.

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Can Green Infrastructure promote the Urban Renaissance and aid urban sustainability in the UK?

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ABSTRACT

The UK government's Department for the Environment, Transport and the Regions (DETR) 'Our towns and cities: the future' (2000) document promoted the prospect of an urban renaissance in the UK developed through a series of urban renewal initiatives to create better places to live, work and recreate. Six years on from the Urban White Paper and there continues to be a policy drive through programmes such as The Northern Way and the Thames Gateway that focus the work of the Office of the Deputy Prime Minister (ODPM) and now the Department for Communities and Local Government (DCLG) on promoting better quality environments through integrative design, social inclusion and public participation. However, whether urban renewal can succeed without a progressive integration of multi-functional greenspaces into the urban matrix is still uncertain?

This paper proposes that Green Infrastructure can play a pivotal role in the urban renaissance by providing a complementary green matrix of spaces that offer multi-level benefits for human populations. Secondly, Green Infrastructure is also viewed as simultaneously providing natural resource sinks to assist urban climate control, water management and provide important green networks in an increasingly urbanised Britain.

Green Infrastructure as a delivery mechanism has been discussed as holding the potential to develop environments that fulfil the remits of the DCLG and the new government manifestation of Natural England. Due to the potential of Green Infrastructure to be '*retrofitted*' into most environments this paper will argue that Green Infrastructures can be delivered across diverse urban environments in the UK to promote sustainable community engagement and management with their local environments. It will also suggest that ecological and economic agendas can also be successfully incorporated into Green Infrastructure plans to promote an increased sustainability within urban areas.

Overall this paper will address how Green Infrastructure can be planned within urban environments to promote increased human integration, ecological sustainability and economic regeneration. It will argue that through the integration of green spaces into the urban matrix that urban environments can be developed as multi-functional and sustainable places at both community and municipal levels. This argument will draw on examples from the UK to emphasise the role Green Infrastructures can play. Finally, this paper will suggest the broader implications for climate control and economic regeneration that Green Infrastructure integration can deliver, will in the long-term, provide a base for a continued urban renaissance.

Key words: Urban renaissance, Green Infrastructure, climate control, social inclusion, integration.

1. INTRODUCTION

In 2000 the UK government office in charge of transport, social and environmental infrastructures, the Department of Environment, Transport and the Regions (DETR)¹ released its vision for the regeneration of urban areas. This programme named the *Urban Renaissance* (DETR, 2000) was developed as an agenda through which better places to live, work and recreate could be created. The primary focus of the DETR's vision was to develop places that fulfilled the environmental, financial and social agendas of this, and other government offices² by promoting urban areas in Britain as thriving and vibrant places. The Urban Renaissance agenda thus outlined a set of practical strategies for implementing and developing cohesive and structured urban living (DETR, 2000). By working through an agenda that constituted of a number of 'visions' and utilised the fundamentals of regeneration and sustainability as the driving force behind urban renewal. The agenda also placed a high value on the development on appropriate infrastructures (ecological economic and social) stating that to fulfil its aims the Urban Renaissance must be able to;

...achieve[ing] urban integration means thinking of urban open spaces not as an isolated unit - be it a street, park or a square - but as a vital part of the urban landscape with its own specific set of functions.

(DETR, 1999:Pg. 57)

In order to deliver such as an agenda the DETR and subsequently the Office of the Deputy Prime Minister (ODPM) and Department for Communities and Local Government (DCLG)³ developed additional programmes based on similar issues to those outlined in the Urban Renaissance. Whereby they have reinforced the role social and environmental justice must play in developing better environments for people to live in (Finco and Nijkamp, 2001). Within the DETR's work the role of public participation, diverse management practices and development partnerships have also been viewed as an essential process vital to the success of the agenda. Since its development the Urban Renaissance has been mirrored by other exemplars of multi-partnership work in the Thames Gateway and Northern Way Growth Corridor, where the role of public consultation and social interactions have also been viewed as a key elements in the development of better places to live. Through these systems of multi-partner management the DETR and other organisations have stated that each town and city would be able to develop a plan for the future and put into place mechanisms for its successful implementation urban renewal (DETR, 2000).

¹ The Department for the Environment, Transport and the Regions was created in 1997 to amalgamate the portfolios of the Secretary of State for the Environment and the Secretary of State for Transport.

² These departments include the Office of the Deputy Prime Minister (ODPM) and its current manifestation of the Department for Communities and Local Government (DCLG).

³ The Office of the Deputy Prime Minister and the Department for Communities and Local Government are the office promoting currently promoting the UK government's vision of prosperous and cohesive communities, offering a safe, healthy and sustainable environment for all.

The role of multi-scale integration in the development of appropriate and innovative urban green design will form a part of this paper. This will focus on how Green Infrastructures can be used to delivery the values of the Urban Renaissance at a number of contrasting scales, from local street level programmes to larger municipal projects. Although the differences in delivery scale may vary this paper will argue that Green Infrastructure offers a greater level of flexibility to be retrofitted into existing spaces or to be implemented as an integral part of new developments. The paper will also outline how Green Infrastructures have also been viewed as a mechanism for combating the effects of climate change. However, the main focus of this paper will be to outline how, and indeed whether Green Infrastructures can contribute positively to the Urban Renaissance agenda and create 'public spaces [that] work best when they establish a direct relationship between the space and the people who live and work around it' (DETR, 1999: Pg. 57)

2. SIX YEARS ON: THE ROLE OF THE URBAN RENAISSANCE

Six years on from its presentation and the Urban Renaissance agenda is still focusing policy on vital areas. Since its release the values of public participation, increasing sustainable living and creating and sharing prosperity have been integrated into other policies by both the UK government and by a number of Non-Governmental Organisations (NGO's) and delivery partners. With government departments such as the DCLG, Department of Health (DoH, 2004, 2005) and the Department of Culture, Media and Sport (DCMS, 2002) all using elements of the Urban Renaissance as a way of promoting a better standard of living across the UK. By utilising the Urban Renaissance's views on social inclusion, environmental sustainability and the development of well-kept cities the DCLG itself has also been able to promote its role as a delivery agent for 'cohesive communities that offer a safe, healthy and sustainable future' (www.communities.org.uk, 26/01/07). This has been made possible through their attempts to create communities that are prosperous and provide opportunities for local populations. The DCLG have also embedded the principals set out in the DETR's work at the heart of their drive for social justice, social mobility and the promotion of economic inclusion.

Due to the broad scope of the Urban Renaissance it has been possible to adapt its visions into a number of urban renewal programmes. From developing better quality homes, to providing a higher standard of services the ethos of the Urban Renaissance has been incorporated into additional contemporary policy. With its focus on providing people with better quality environments the Urban Renaissance has used the foci of community, opportunity and prosperity as a way of driving forward the policy agenda (DETR, 2000). Following its publication the Urban Renaissance has potentially become more relevant because of the UK governments drive to increase social inclusion and provide its citizens with a better standard of living. Thus, the role of better urban design and the development of better services infrastructures such as schools, medical services and green spaces has become of paramount importance in achieving its targets. This remit has also been written into other government policies such as the Sustainable Communities developed by the ODPM (ODPM, 2005). The Sustainable Communities programme promotes several of the key issues in

the Urban Renaissance⁴ and looks to improve the relationship between people, places and the environment. In the ODPM programme this can be achieved through a better understanding of the needs of any target population. Therefore by balancing and integrating the economic, environmental and social components of a communities needs the ODPM aims to create inclusive, safe, well designed and environmentally sound landscapes (DCLG website, 29/01/07; ODPM, 2005).

Each of these areas thus compares favourably with the visions set out in the Urban Renaissance but achieving them is a more difficult target. Two projects that have looked at combining the policy focus of the Urban Renaissance and the Sustainable Communities programme with realistic delivery are the Northern Way Growth Corridor and the Thames Gateway. Both projects offer an insight into how pan-regional or multi-partner projects can be developed to meet the ecological, economic and social needs of large diverse populations.

The Thames Gateway has been described by the ODPM as holding enormous assets that if developed thoroughly could bring the area up to the growth standards of the rest of the South-East (DCLG, 2006b:2). The programme itself offers a good example of how a multi-agency project can be run to effectively rejuvenate a region that has underperformed in a region of excellent performance. Within its remit the Thames Gateway project aims to enhance the existing infrastructures of the region by reviewing the needs of local populations and increasing the areas livability (ODPM, 2005). This is being achieved through a combination of integrative design, a balancing of environmental and ecological functions and an overall the enhancement of the landscape (DCLG, 2006a). In short the Thames Gateway Partnership has provided a set of visions which through management co-operation and integration have been able to develop a more cohesive set of places. However, due to its location in the South-East growth area the Thames Gateway has been subject to extensive funding and is more likely to achieve its renewal targets than other regions. In contrast to the Thames Gateway the Northern Way Growth Corridor does not have the same level of government support or strategic policy framework within which to promote the Urban Renaissance. The Northern Way Growth Corridor itself covers the three regions of the North of England; the North-East, North-West and Yorkshire and Humber, all of which are landscapes steeped in stages of post-industrial renewal. One of the aims of the Northern Way is thus to rejuvenate the post-industrial cities of the region by promoting economic growth and attracting capital and people to live in the region in the long-term (Goodchild and Hickman, 2006). It aims to achieve these goals through urban and economic renewal both of which have been emphasised strongly within the Northern Way documentation (Northern Way Steering Group, 2004). However, whether these targets are achievable in such a diverse and potentially fragmented physical and social landscape is still unclear.

⁴ In both the Urban Renaissance and the Sustainable Development agendas social inclusion, landscape regeneration, environmental integration and multi-actor organisation and management are emphasised.

The targets and visions set out by both the Northern Way and Thames Gateway Partnerships rely on their ability to implement renewal through innovative landscape change. It is hoped that the removal of barriers to development such as economic stagnation or a lack of capital funding in the Northern Way Growth Corridor will enable urban renewal to take place. Both programmes acknowledge that to deliver these visions the lives of those people who reside in the regions must be improved. Thus, to achieve these targets both the physical and social environment must be considered equally important as the people who live in an area affect both the economic growth of an area but also the long-term liveability and well-being of a place. Both of these factors have however been debated as forming elements of what Green Infrastructures can deliver.

3. GREEN INFRASTRUCTURE AND LIVEABLE SPACES

Green Infrastructures are the spaces in and around urban areas that provide ecological, economic and social environments for sustainable living and urban development (TCPA, 2004). They offer spaces that hold multi-functional benefits⁵ for a broad range of demographic groups and can be located in all areas of the urban-rural matrix⁶. However, there are a number of fundamental principals that underlie its use and its value in relation to the Urban Renaissance. Authors including Benedict and McMahon (2002, 2006) outline the ecological function of Green Infrastructure as a conservation and ecological connective element. Williamson (2003) notes the role Green Infrastructure can play in providing ecological sinks for the management of environmental resources such as water and essential nutrients. Both of which are important if long-term sustainable land use is to be delivered. Simultaneously and in contrast to these authors, Davies *et al* (2006) and Green Infrastructure North West (www.greeninfrastructurenw.com, 26/01/07) place a high value on multi-functionality and use of Green Infrastructures as a way of connecting people through better proximity and access to green spaces across urban and urban-fringe areas. These later authors have all highlighted the work of the Countryside Agency and Groundwork (2005)⁷ to show the potential that Green Infrastructure has to provide a number of multi-scale benefits to a broader demographic. These benefits which include; providing access to green spaces, places to exercise and recreate, links to local heritage, regeneration, access for education, social cohesion and the development of attractive places to live within. Each of these areas also compliments the issues noted by the DoH (2004), ODPM (2003) and DCMS (2002) as essential to sustainable and healthy living within the Urban Renaissance.

⁵ See for example the Countryside in and Around Towns (Countryside Agency and Groundwork, 2005) or the Sustainable Communities agenda (ODPM, 2003)

⁶ Examples include parks, gardens, river corridors that make up the green networks and also include nationally designated land types i.e. National Parks and Sites of Special Scientific Interest (SSSI) and the Boston Emerald Necklace at an international level (Pauleit *et al*, 2003; Fabos, 2004).

⁷ See the Countryside in and Around Towns (Countryside Agency and Groundwork, 2005) document for a full description of the ten main areas that the Countryside Agency state that green infrastructures can promote.

In practice Green Infrastructures are being used in the UK, Europe and North America to fulfil a number of urban and ecological policies. In the United States Green Infrastructures are used to conserve and protect landscapes from overdevelopment and landscape degradation (Williamson, 2003). Green Infrastructures plans are also being developed at county levels in Maryland to promote exemplar projects highlighting the sustainable benefits of the process (Weber, Sloan and Wolf, 2006). Alternatively in the UK England's Community Forests have embraced Green Infrastructure as both a way of further promoting their remits but also as a mechanism for addressing broad social and ecological change simultaneously. In doing this the Community Forest network have been one of the main protagonists delivering the Countryside in and Around Towns (CIAT) agenda and in developing multi-functional spaces that are accessible a broad range of people. Alongside the Community Forests there have been a number of organisations attempting to deliver landscape diversification though innovative design (England's Community Forests, 2004). The work of the North East Community Forest (NECF) in conjunction with the Countryside Agency, Natural England, Forestry Commission and Groundwork is one such group where Green Infrastructure has been discussed as offering an innovative landscape management process that can create diverse and inclusive landscape opportunities (Davies *et al*, 2006).

If Green Infrastructure is to be reviewed as a major contributor to the Urban Renaissance then the concept needs to be seen as an equally important infrastructure as housing, services or transport infrastructures. By placing this value on Green Infrastructure development planning authorities would have an obligation to invest in Green Infrastructures into their urban renewal plans.⁸ Unfortunately for those people championing Green Infrastructure, such as those plans developed by the Community Forests programme and Natural England, there still appears to be strong focus placed on landscapes being used for economic development. This is viewed by some as lowering the potential of regional and local level agents to deliver multi-functional landscapes because they may not be economically viable (ECOTEC, 2006). However within the DETR's initial Urban Renaissance document it was stated that funding would be made available for alternative infrastructure projects. One example of this is where the DETR claimed that 65% of the transport infrastructure expenditure would be moved to fund projects prioritising walking, cycling and public transport (DETR, 2000:11). Although this funding may not have been granted for Green Infrastructures projects it is a move towards appropriate planning for sustainable living of which Green Infrastructure may play a major part.

4. CLIMATE CONTROL AND GREEN INFRASCTURE

As Green Infrastructure have gained support being viewed as a multi-scale landscape management process the concept has also been increasingly

⁸ To develop a statutory role for Green Infrastructure planning the concept must be embedded within both national planning policy guidance's and statements (PPG's and PPS's) but must also be developed within the Regional Spatial, Development and Economic Strategies (RSS, RDS and RES) of a region.

debated as holding a potential role in combating the affects of climate change. The work of Benedict and McMahon (2006) supports this view and highlight how Green Infrastructures can be developed as environmental sinks for natural resources. In their work, and also the work of Davies *et al* (2006) it is noted that the creation and maintenance of green spaces allows ecological resources to be developed that provide landscape sinks militating against environmental change. This can be achieved by developing both large expanses of flora and fauna, water or green spaces but also by developing pockets of ecological infrastructure within urbanised areas. Therefore, trees, back gardens, play areas and pocket parks all hold substantial ecological value and when discussed as a broader green matrix highlight how creating and connecting green spaces can provide a level of compensation for some of the effects of climate change (Williamson, 2003).

Figure 1 Linking Green Infrastructure concepts with climate control (source: Williamson, 2003)

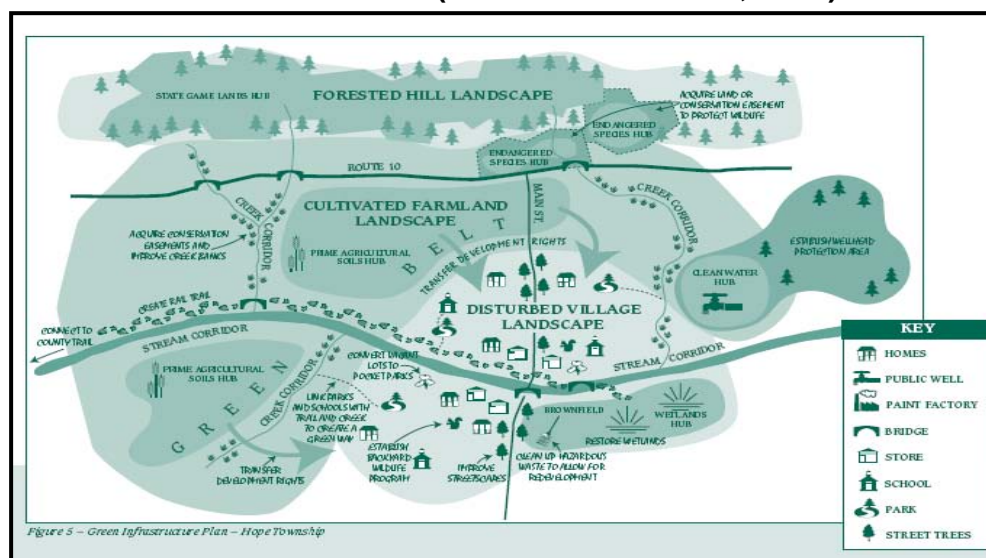


Figure 1 above highlights this process. In Williamson's work she notes that development must be discussed in conjunction with environmental targets and information. The work Heritage Conservancy thus states that integrating Green Infrastructures within urban or built developments provides a level of climatic control that would otherwise be lost to grey or impervious infrastructures (Williamson, 2003).

The work of Robert Brown develops this view as he outlines how the use pocket parks and street trees in New York have lowered or stabilised the surrounding air temperatures (Brown and Gillespie, 1995). This affects has long been associated with the role of water (i.e. canals or lakes) but Brown's work highlights how small green spaces or infrastructures can provide climatic stability beyond their immediate boundaries. Brown's work thus offers an indication of the value that a small area of Green Infrastructure can provide for its surrounding environment. However, if this view is expanded to a municipal or regional scale then Green Infrastructures can be discussed as providing large scale contributions to the climate (see Williamson, 2003, Benedict ad McMahon, 2006). In areas of urban renewal such as London or Newcastle

this is becoming an increasingly important way of attempting to control the liveability of urban environments⁹. Thus, green spaces in London such as Regents, Hyde or St James parks provide spaces that accommodate a significant proportion of London's visible green spaces. Each of these spaces provides places for gardens, grass pitches, lakes and trees offering spaces that control the micro-climate of the increasingly polluted streets of London¹⁰. These spaces can also be viewed as a part of the wider London Green Infrastructure matrix that provide ecological sinks across the city and into the urban-fringes of Middlesex, Essex and Surrey (see for example the Thames Gateway work by ODPM, 2003).

Green Infrastructures subsequently provide a landscape category through which ecological components can be developed within the wider urban matrix to provide localised climate control (ODPM, 2005). However, as they can also extend across wider municipal regions they also offer mitigation against wider climatic issues such as flooding by working within a network of Green Infrastructures designed to cope with such environmental stresses.

5. GREEN INFRASTRUCTURE AND THE URBAN RENAISSANCE

The above debates have highlighted some of the areas that different authors have noted as being valuable outlets for Green Infrastructure planning. However, if Green Infrastructures are to be planned to enable increased human integration, ecological sustainability and economic regeneration they must take into account a broad range number of ecological, political and social factors. To be successfully integrated into urban matrices Green Infrastructures must firstly be planned with the functions they are to fulfil in mind. Designing landscapes that do not provide a number of beneficial functions for their target populations may hinder patronage and lead to the development of an exclusionary space (Countryside Agency and Groundwork, 2005; Sibley, 1995). Landscape functionality must therefore be seen as essential if people are to use a site. Green Infrastructures can thus be a way of achieving this goal as they have the ability to provide a number of simultaneous functions covering health, recreation or general well-being that promote social inclusion (see previous CIAT comments). Therefore through a system of Green Infrastructure development there is the potential to increase people's awareness, use and subsequent ownership of a space and developing its long-term sustainability (CABE Space, 2005a). This in turn also promotes some of the features of the Urban Renaissance by increasing public use of green spaces and by allowing people to feel a part of a spaces well-being. They may also consequently make the spaces safer and more attractive to other users through increased patronage (Burgess *et al*, 1988).

Secondly, as discussed in section 4 Green Infrastructures also have a role to play in addressing issues of climate change. This idea works in two ways; firstly it assumes that urban environments have an increasingly modified

⁹ See for work of the North East Community Forest and University of Bari Green Exercise work for further details (Work in progress)

¹⁰ Pollution in London has dropped since the introduction of the Transport for London (TFL) congestion charge but the level of emissions is significant.

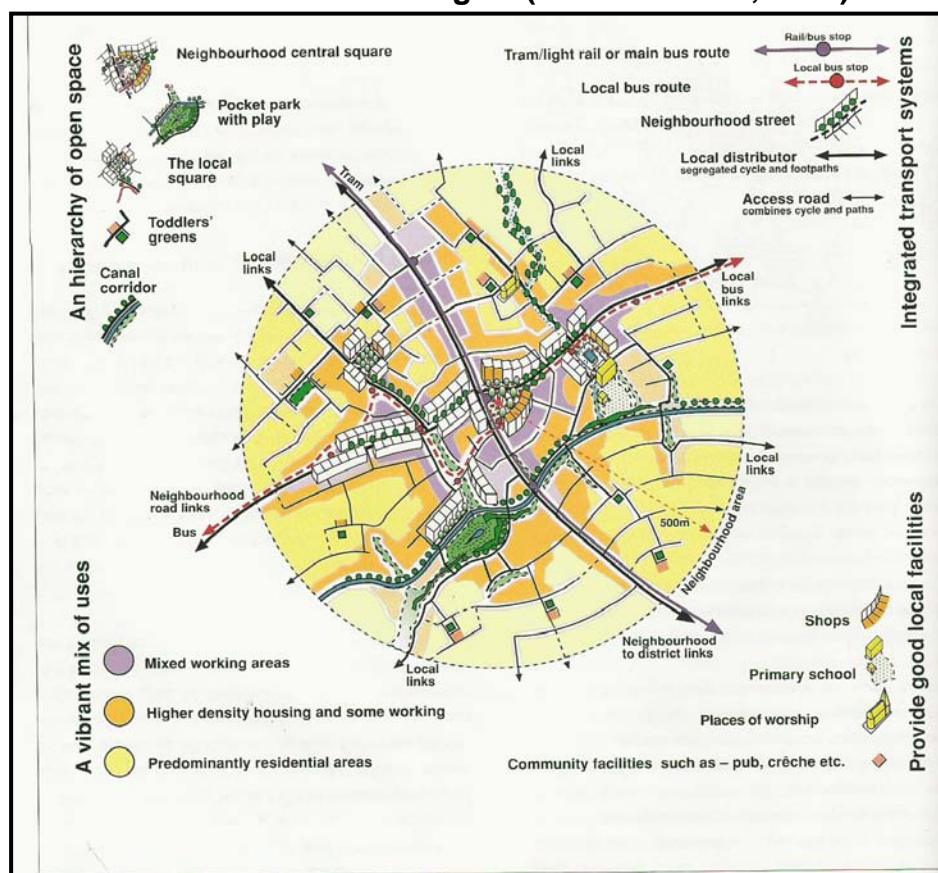
climate compared to urban-fringe or rural areas because of their built infrastructures (Beatle, 2000). Consequently, urban areas are assumed to have a lower tolerance to climate change because they are composed of a number of closed systems. Green Infrastructure can thus offer microclimatic controls in urban areas by providing spaces that intercept rainfall, absorb solar radiation and increase urban cooling effect (Kloss and Calarusse, 2006). This idea is very important in large cities and areas with arid or hot climates where shade can provide a better quality of life by relieving heat stress and fatigue (Brown and Gillespie, 1995). Secondly at a broader scale Green Infrastructures can act as an ecosystem manager and natural resource sink. In this case Green Infrastructures act as buffers to climate change and provide spaces that can adapt to diversifying weather situations such as flooding or drought. This can be achieved by providing a space where excess rain water can be stored and then dispersed (i.e. the proposed Airedale Nature Reserve near Leeds, West Yorkshire). Thus, within the context of current estimates that state that extreme weather conditions will increase this makes large scale Green Infrastructure projects more viable to landscape managers (Benedict and McMahon, 2006).

This level of integration can be achieved by creating networks of spaces that allow the flow of energy (i.e. water or pollutants) to pass from different danger points into sink areas for storage. In a recent document produced by the Environment Forum North East for the North East Strategy for the Environment (NESE) the role of ecosystem management was heavily emphasised as a way of developing the North-East environment to protect against climatic change (Environment Forum North East, 2006). When these two points of view are contextualised within the Urban Renaissance there does appear to be a strong link between climate change mitigation and Green Infrastructure. At a micro local or city scale, and macro or municipal scale Green Infrastructures can aid small and larger scale climate control. By providing landscape elements that provide a better quality of life by relieving the stresses associated with temperature and humidity but also by using large scale Green Infrastructure projects to manage change through natural green space functions.

Thirdly, Green Infrastructures provide a process that can aid the Urban Renaissance through economic renewal. As seen in the Northern Way Growth Corridor landscapes play a major role in attracting business and economic renewal to regions of decline (Goodchild and Hickman, 2006). The North-East Regional Development Agency, ONE NorthEast has been one of the main proponents of this process using the iconic Green Infrastructures of the region as one of their main drivers in promoting the region across the UK. The DETR themselves also point out that attractive and well designed spaces are able to attract business because people want to live in these areas (DETR, 1999). This view has also been strongly supported by the Community Forest programme in England who believe that attractive places to live come from a combination of better services, recreational facilities and attractive functional landscapes. Thus, the Community Forest Partnerships have stated that economic regeneration is a process that is linked directly to landscape. In previous generations this link was related to natural resources such as coal

but at present it relates to the quality of life people can expect in any given area. Likewise in the Thames Gateway project Green Infrastructure development has been seen as a vital part of achieving sustainable communities and promoting social inclusion (ODPM, 2005).

Figure 2 Green Infrastructure elements and their fit with urban renewal strategies (Source: DETR, 1999)



The work of the DETR drive towards the Urban Renaissance can be seen in Figure 2 which presents a number of these ideas. The figure highlights how Green Infrastructures can be developed in conjunction with transport or 'grey' infrastructures to form a matrix of mixed-use, accessible environments that offer amenities and activities for different demographic groups.

Through a combination of these issue Green Infrastructures have been discussed as offering a landscape management process that can provide long-term urban sustainability. However, the development of Green Infrastructure is still in its formative stages and there needs to be a balance between its supporters and the tangible or achievable benefits that can actually be delivered. If Green Infrastructures are to aid the Urban Renaissance then a number of factors need to be addressed.

Firstly, the political climate of the UK still places a high emphasis of the economic value of landscapes. Unfortunately health benefits or physiological well-being are not readily seen to hold the same value as the financial recuperations from housing development. Consequently all too often

landscapes and their functions (ecological and social) are underestimated compared to the economic incentives of development (ECOTEC, 2006). Secondly, there is still a lack of a coherent dialogue between land managers and policy officials relating to Green Infrastructure. This has led to a number of contrasting policy streams being developed at all levels from Local Authority (LA) to government agencies (Goodchild and Hickman, 2006). This in turn has meant that landscape developments do not always promote the best land use but the best interests of developers. Therefore, a dialogue between all stakeholders including the public is needed if, as the Urban Renaissance states, people are to share the future (DETR, 2000). This is also a vitally important area for Green Infrastructure as only through policy recognition can it become a statutory landscape management process. Finally if Green Infrastructure is to be discussed as a positive landscape management process planners and developers need to review the long-term viability of developments. In large scale municipal projects such as the Emerald Necklace in Boston or Central Park in New York in the United States these projects were viewed in terms of the broader benefits they could deliver across a number of scales (Fabos, 2004; Hiss, 1991). Both of these projects viewed the city as a system with inputs and outputs and were developed as a way of providing environmental access for all. In the UK if Green Infrastructure is to succeed it needs to be viewed by planners as a way of linking people and landscapes with the long-term aim of creating sustainable places to live. Therefore by engineering places that people want to live in the ecological, economic and social interactions of the Urban Renaissance may be achievable.

6. CONCLUSION

Green Infrastructure has been debated as offering a number of broad benefits in ecological, economic and social spheres. Within this paper I have outlined how they have been viewed as providing a process through which climate change can be militated against. The paper has also examined the broader social and economic benefits outlined in current government policy relating to green space and urban renewal. Overall, the Urban Renaissance agenda aimed to develop places for sustainable living that allowed people to develop links with their environments and to create and share prosperity. Green Infrastructure as a delivery mechanism, with a number of appropriate foci can aid this process but only if developed appropriately. Like many green space planning mechanisms Green Infrastructure planning must take into account the needs of an environment, be they social justice, exposure to innovative green spaces or simply the ability to move within and around their environments freely. Therefore landscape managers and developers must be careful when developing Green Infrastructure not to develop spaces that work within too small a remit. As Jan Gehl (1987) notes when discussing urban design 'first life, then spaces, then buildings' proposing that liveable spaces are at the heart of acceptance and continued use of spaces. Thus, to promote social inclusion spaces cannot be retrofitted without appropriate public consultation outlining a community's wants and needs. In areas such as the Thames Gateway this process has been adopted and the subsequent development of housing, transport and Green Infrastructures has been implemented successfully within local support (ODPM, 2005).

If the Urban Renaissance is to be achieved effectively alongside other programmes such as the Sustainable Communities agenda then the following processes must be put into place. Firstly, developments must take into account the different needs of ecological, economic and social influences when decisions of appropriate design are being made. This must also view each of these areas of equally important in meeting targets set by the Department of Health (DOH), Department of Culture, Media and Sport (DCMS) and the Department for Communities and Local Government (DCLG). If developers do not take the needs of health, social inclusion and service provision into account then the long-term viability of urban renewal may be unrealistic. Secondly, as a mechanism for delivering these and other potential answers for climate change Green Infrastructure must also be developed at an appropriate scale and with a relevant focus. Any underestimation of the complexity of green spaces within urban-rural matrix could undermine the value of the space itself and hinder its function (CABE Space, 2003, 2005a, 2005b). Consequently, a strategic systems approach is proposed as an effective mechanism for a fuller understanding of the ecological interactions and functions of any given landscape¹¹. Finally as an appropriate mechanism for delivering the Urban Renaissance Green Infrastructures is not a quick fix solution but should be viewed as part of a long-term process of developing liveable spaces. Designed appropriately and developed with ecological, economic and social factors in mind Green Infrastructure can be a valuable component of the urban matrix for successful renewal. In the same manner that communications, housing or transport infrastructures cannot develop better places to live individually, but together this is possible. Green Infrastructures must be viewed in the same way, as an essential part of an integrated process of developments aimed at creating attractive towns and cities that perform as long-term sustainable places of prosperity and cohesion.

¹¹ A systems approach to green infrastructure is proposed based on theories drawn from Landscape Ecology, Green Urbanism and environmental systems literature.

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