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Sustainability implementation and monitoring through Land Use Planning: A closer look at Brownfield Regeneration.

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Abstract:

This document defines and looks at Brownfield Redevelopment Projects (BRP) land use life cycle thus developing an understanding of the different processes involved and the way they ultimately affect the sustainability of these BRP. The paper concludes that the Land Use Planning process which ultimately any BRP needs to undergo is the most important process as it is at this stage the future sustainability of the development is determined. It is identified that through the planning phase of a project life cycle local authorities and regulators have the greatest powers to implement sustainability. A review of the Land Use planning contextual (or policy) stance with regard to sustainability and brownfield regeneration identifies that brownfield regeneration is considered de facto sustainable and is on the top of the policy agenda. Sustainability although described as the core aim of planning lacks policy cohesion, with no planning policy guidance referring specifically to the concept, but rather being referred to in different topic planning policy documents for example transport, housing etc without clear guidance on its implementation . This lack of cohesion also characterises the planning processes and initiatives available to monitor and implement sustainability especially at the development level which are characterised by fragmentation and lack of standardisation.

However, land use planning in the UK is changing, and the changes are examined together with the introduction of the Strategic Environmental Assessment Directive 2001/42/EC which has the potential to change or introduce sustainability monitoring of plans and policies. The relevant processes and opportunities identified for BRP sustainability implementation and monitoring at the development control rather than planning policy and development plan scale, are identified as those of planning gain, Environmental Impact Assessment and Regulations, whose limitations and prospects are described as well as potential for integration with SEA and the Redevelopment Assessment Framework (RAF) (Pediaditi, et al, 2005).

Keywords

Brownfield Redevelopment Projects, Land use Planning, implementation monitoring, Sustainable Development,

Table of Content:

Main report:

1. Purpose & Frame of Reference

This Working Paper is the first literature review out of a series of four:

a) Sustainability implementation and monitoring through Land Use Planning: A closer look at Brownfield Regeneration.
b) Risk, its Role in Brownfield Redevelopment Project decision making and conceptual commonalities to sustainability.
c) Participation in Brownfield redevelopment projects and sustainability monitoring.
d) Sustainability monitoring and indicators, a review. Applicability to Brownfield redevelopment projects.

The working papers have been conducted to support and inform research being undertaken under the Sustainable Urban Brownfield Regeneration Integrated Management (SUBRIM), which is looking at brownfield sustainability Metrics (Work Package D). This research funded by the EPSRC (Grant Number: 19) aims at creating a framework to enable the development of site specific indicators to monitor the sustainability of brownfield redevelopment projects.

Since sustainable development came onto the global and national agenda, arguable in 1992 with the Rio Declaration, a lot of research has gone into developing tools and indicators to monitor progress being made towards it. However, despite the plethora of available sustainability assessment and monitoring tools very few have been consistently adopted and used to monitor sustainability, especially at the development level. This failure amongst other things has been attributed to these tools lack of integration into existing development and more specifically planning and regulatory processes. It was therefore deemed important for the purpose of this research to examine, the Brownfield Redevelopment Process (BRP) and to

identify the different planning and regulatory processes currently employed to implement and monitor sustainable development. By undertaking this review opportunities as well as current limitations of the ever developing UK land use planning system can be identified which can create the basis for developing a practically implementable and adoptable BRP sustainability assessment framework.

2. Introduction

This paper starts by defining and describing the BRP land use life cycle process (Section 3). The importance of Land Use planning in determining the sustainability of a project is examined (section 3.1). The land use planning policy context is outlined with regard to sustainability and brownfield regeneration (section 4) with a closer examination of existing processes in place to implement and monitor sustainability through planning (section 5). However, the UK land use planning system is undergoing reform, and a closer examination of the changes this reform is going to have on sustainability implementation and monitoring is undertaken (section 5.3). Finally, the specific planning mechanisms available at the development control level which are applicable to BRP are investigated with regard to the implementation and monitoring of sustainability at the site level (section 6). Limitations and opportunities for the integration of the RAF (Pediaditi et al, 2005) are outlined, with recommendations being proposed in Section 7.

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3. The Brownfield redevelopment Process.

3.1 Defining Brownfields

There are a number of definitions of brownfield, and there is yet to be a universally or nationally adopted definition of the term. Many classify brownfields as the opposite of a Greenfield, which although also doesn't have an official definition has been taken to mean land which has not previously been developed (POST, 1998). The (US EPA, 1996 pg 1) defines brownfield land as ' *Abandoned, idled, or underused industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination*' The term brownfield in the US has a connotation of always being contaminated, which is not always the case as a site may be previously developed but contamination may not be present .

Alker et al (2000), having undertaken a review of existing definitions national and international, of the term brownfield propose a definition for universal usage which is adopted for the purpose of this research. "*A brownfield site is any land or premises which has previously been used or developed and is not currently fully in use, although it may be partially occupied or utilised. It may also be vacant, derelict or contaminated. Therefore a brownfield site is not necessarily available for immediate use without intervention*" (Alker et al, 2000 pg 49).

3.2. The land use life cycle of a Brownfield redevelopment project.

Brown (2003), in a criticism of academic research with regard to better quality of life and sustainability implementation, points out the need for research to examine the development process functions and find ways of integrating their findings within the existing decision making processes of the various stakeholders including developers. Therefore, the development process is outlined with specific reference to the particularities of Brownfield redevelopment process.

According to Avis in (Topping & Avis 1991), The main stages in the development process are: Initiation, Evaluation, Acquisition, Design and Costing, Permissions, Commitment, Implementation, Let/Manage/Dispose. However, these stages do not always follow this sequence and often run in parallel (ibid). With regard to the implementation of sustainability and decision making Dair & Williams (2004) makes a simpler account of the Brownfield Redevelopment Process by phasing it into three stages; land use planning and regulation; development and construction, and end use. Additionally, the authors suggest a remediation stage, which may be required in some BRP prior to development and construction (figure 1). These stages are described in further detail with regard to what they encompass focusing on particularities with regard to brownfield redevelopment.

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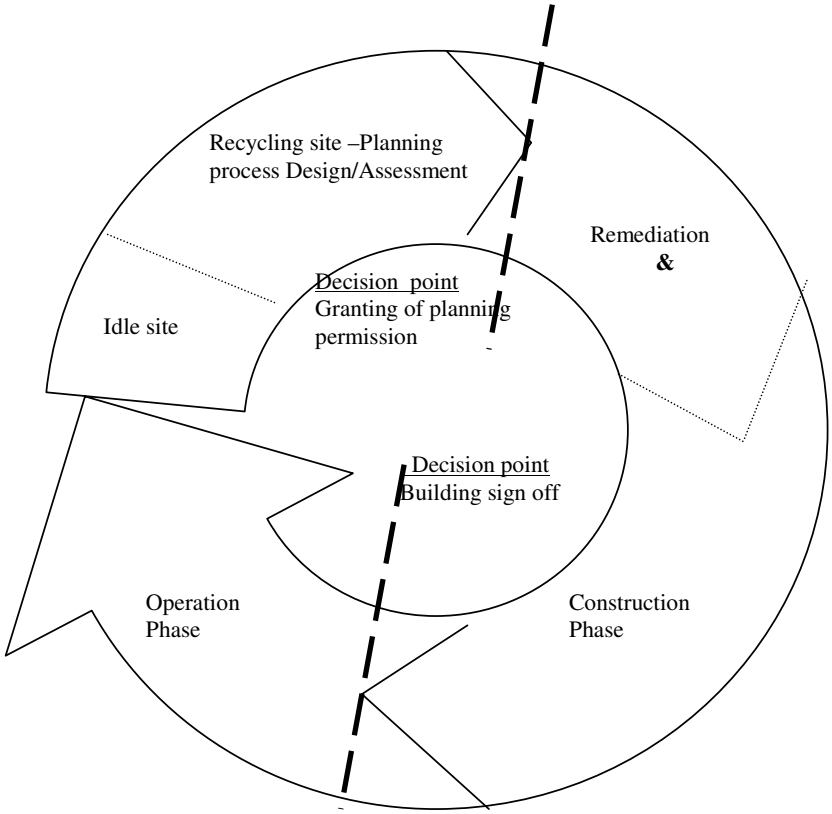
Figure 1: Brownfield Land Use Life Cycle:



The land use planning and regulation phase, is arguably the most important phase as decisions are taken at this point which will affect the sustainability of the development throughout its life cycle. With regard to brownfield redevelopment this initial phase is most likely to include an initial stage where by the site remains idol (Figure 1). This period varies in length and could extend over several decades before interest is expressed in redevelopment.

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The only decision making involved with regard to a brownfield site at the idol stage is its characterisation in the Local Development Framework (LDF) or Local Plan (LP), ie. land allocated for employment generation, housing etc. The sustainability with regard to the land characterisation, is identified through the environmental appraisal, and Strategic Environmental Assessment of the LDF or LP (Hales 2000 & Cullingworth & Nadin, 2002). However, detailed examination of this process is beyond the scope of this study, although an overview is presented in section 5, as emphasis is placed on the actual development process, meaning the process following an expression of interest in development of the brownfield site.

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This does not imply that not developing the site would result in an unsustainable site. On the contrary, brownfield sites which have been abandoned for many years often are recolonised and are of great biodiversity value in their own right (Woodall & Crowhurst,, 2003, Firth 2001, Mabey 1999). However, no redevelopment on a brownfield site implies, that there are no decision making and planning processes in progress and potentially no responsible stakeholders through which sustainability can be implemented, and therefore it is feasibly impossible from a procedural point of view to make requirements for sustainability monitoring. Should a site be allocated for open or recreation space which would result in change of use or even formalisation of current use, involving active management then it could equally be considered in the following development process described below.

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In this initial planning and design phase, the four first stages identified by Topping & Avis (1991), above are included. Development is initiated when a use for a site has been identified or when a site has been allocated for a particular use. Evaluation is a vital stage in the process, with the main stakeholder and decision maker being the developer. This stage includes an

assessment of the site's potential, and especially with regard to brownfield sites it may include risk assessments especially with regard to contamination. Issues with regard to obtaining planning permission are considered by the developer at this point prior to moving to the acquisition stage, and design and costing. Ideally at this point the developer would consider the sustainability issues with regard to the nature of the site and the considered development. However, there are no formal processes in place obliging a developer to make any such considerations apart from a review of the policies and regulations, the limitations of which are examined in section 4.

The design and costing phase are continuous processes interlinked with the stage of obtaining planning permission. In these two interlinked stages are where the most stakeholders are involved and where important decisions affecting the sustainability of the development throughout its life cycle are made. Williams (2003) points out that through the design and specification briefs of the development is where decisions such as the choice of materials and construction methods are made, all of which affect the sustainability of the site. Through Pre-application discussions with the local authority as proposed in the Green Paper (DETR, 1998) discussions/negotiations can be made with regard to introducing sustainable practices. However, these may not be obligatory, or may be required through supplementary guidance or as part of Section 106 Agreements, which are discussed in detail with regard to their sustainability implications in section 6.

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The planning application process or the obtaining of permissions stage is undoubtedly the stage with the most stakeholders involved and has the greatest potential to improve the sustainability of brownfield development projects. (See ODMP (undated Annex A) for a list of statutory and non statutory consulties.) The process is analysed in detail in section 5 however,

in terms of the BRP land-use life cycle (figure 1) obtaining permission is considered the decision point for phase 1.

Phase 2 includes the remediation and construction phase. Brownfield sites are not necessarily contaminated, but should contamination be identified in the initial phase, following obtaining the appropriate licenses and agreements (see DEFRA & EA, 2004) remediation will have to be undertaken using the UK principle of "suitable for use" (Pediaditi et al, 2005a). Both the way construction and remediation is undertaken on a site may affect the sustainability of the development. Inconsiderate on site operation practices with regard for example noise and dust generation, discharging of waste or effluents to water courses may affect significantly the sustainability of the site. However, there are a number of licenses and regulations dealing with these aspects, although they are minimum requirements and do not constitute best practice. Often, although not always, remediation and construction may occur simultaneously on a brownfield site, where by a phased approach of remediating and constructing may be undertaken. For the above reasons when considering the impacts with regard to these processes as well as the ways of introducing sustainability it is logical to group them in one phase. It is important to note that the processes employed for this second phase of construction and remediation are determined in the planning and design (phase 1). Therefore, with regard to implementing and monitoring sustainability of construction and remediation processes, the issues and indicators need to be established during the initial planning phase, yet monitored for during the actual construction and remediation phase. From the above once again the vital importance of the planning phase in determining and monitoring sustainability is reconfirmed.

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The third and final phase in the development lifecycle is the operation phase which begins with the hand over of the development from the

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developers. This Phase includes renting, selling or leasing the development as well as managing its operation and long term maintenance. In this phase the impacts of the development are mainly fixed and limited changes can be made with sustainability being introduced through the maintenance and management of the development. However, consideration during the planning and design phase of the long term management and operation of the development may be very beneficial in improving the long term sustainability of the development. However retrospective sustainability improvements will have minimal effect when compared to the possible effectiveness of designing in sustainability in the initial phase.

From the above it can is established the there are sustainability implications throughout the whole life cycle of a BRP with a number of stakeholders and processes involved. However, it was identified that the processes in place and the decisions made during the initial planning and design phase have the greatest influence and potential to affect the sustainability of a BRP through out its life cycle as well as involve a greater number and diversity of consulted stakeholders. It is therefore important to ensure sustainability is implemented into the decision making early on in this processes and that sufficient measures are incorporated to monitor the effect that decision making in the initial phase has through the project's life cycle. Having established the importance of land use planning in BRP decision making, it is important to see the UK policy drive and stance with regard to brownfield regeneration and sustainability.

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4. Land Use Planning's contextual stance towards Sustainable Development and Brownfield regeneration.

4.1 The role of Sustainable Development in Land Use Planning policy

The English land use planning system "*is designed to regulate the development and use of land in the public interest*" (Department of the Environment (DoE), 1995, para.2) According to the new draft Planning Policy Statement (PPS1) which is to replace the PPG1 "*Sustainable development is the core principle underpinning planning*" (ODPM 2004, para.1.1). However, sustainable development is defined and perceived in different ways and this has an effect in terms of its implementation. One of the most common definitions of sustainable development is "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*" (WCED, 1987) and is a demonstration of the ambiguity of the concept.

In this section the government's interpretation of sustainable development is described, which has been coupled with the concept of "*better quality of life for everyone, now and for future generations*" (ODPM, 2004, para. 1.12). There are four aims identified in the government's sustainable development strategy "*A better quality of life, a Strategy for Sustainable Development in the UK,* (DETR 1999)" which supposedly should be reflected in all Planning Policy Guidance :

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- "*Maintenance of high and stable levels of economic growth and employment.*
- *Social progress which recognises the needs of everyone*
- *Effective protection of the environment*
- *The prudent use of natural resources*"

Although the planning regime in England is changing (see section 5.2) the importance of government policy guidance will remain strong and therefore it is important to examine the core policies with regard to sustainability. The government announced its approach with regard to delivering sustainability in 2002 in the policy statement "Sustainable Communities: Delivering through Planning" (ODPM 2002). In 2003 the

strategy for delivering sustainable communities was set out in "Sustainable Communities: Building for the future" (ODPM,2003). In this strategy, key specific actions with regard to delivering sustainable communities were laid out.

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Sustainable communities are defined as "*communities that meet the diverse need of existing and future residents, their children and other users, that contribute to a high quality of life and provide opportunity and choice. They achieve this in ways that make effective use of natural resources, enhance the environment, promote social cohesion and inclusion and strengthen economic prosperity*" (ODPM, 2004a pg 18). In the Egan Review the components of sustainable communities are presented (Figure 2).

Although the above provides an understanding of the governments interpretation of Sustainable Development or the newly so-called sustainable communities concepts and the fact that they are integral to planning and should be considered, the definitions remain vague and there is a lot of criticism over their actual implementation (Hales, 2000 & Rydin et al 2003). Greater understanding of the government's interpretation of sustainable development or communities can be obtained by examining the specific objectives set out in PPS1: "Creating Sustainable Communities" (Box 1) or by examining the headline indicators against which the government judges the progress (or lack there of) in implementing the sustainable development strategy "A Better Quality of Life" (1999) (Table 1).

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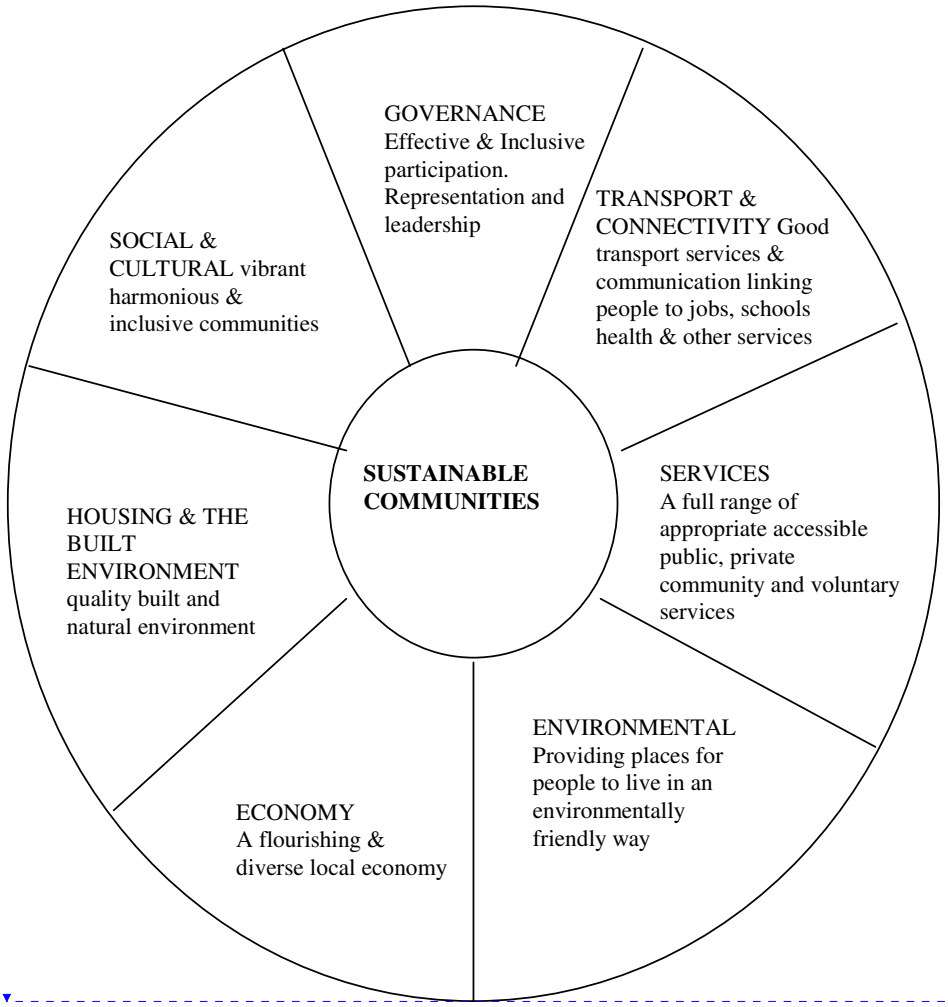

Figure 2: Components of Sustainable Communities (ODPM, 2004a pg19)

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Box 1: Objectives for sustainable development (ODPM, 2004)

- Promoting urban and rural regeneration to improve the well being of communities, improve facilities, promote high quality and safe development and create new opportunities for people living in those communities. Policies should promote mixed use developments that create linkages between different uses and create more vibrant places.
- Promoting regional, sub-regional and local economies by providing a positive planning framework for sustainable economic growth to support efficient, competitive and innovative business, commercial and industrial sectors.
- Promoting communities which are inclusive, healthy safe and crime free, whilst respecting the diverse needs of the communities, including women, young and elderly people, people with disabilities and black and minority ethnic groups.
- Bringing forward sufficient land of a suitable quality in the right locations to meet the expected needs for housing, for industrial development and for retail and commercial development to provide for growth and consumer choice, taking into account accessibility and sustainable transport needs and the provision of essential infrastructure.
- Giving high priority to ensuring access for all to jobs, health, education, shops, leisure and community facilities by ensuring that new development is so far as reasonable located where everyone can access services on foot, bicycle or public transport rather than having to rely on access by car, while recognising the limited potential for doing so in rural areas.
- Focusing developments that attract a large number of people, especially retail development in existing centres to promote their vitality and viability, social inclusion and more sustainable patterns of development.
- Recognising the need to enhance as well as to protect biodiversity and the need to address, on the basis of sound science, the causes and impacts of climate change, pollution and waste and resource management impacts for example through design. When the needs of development are such that some environmental detriment has to be accepted measures to prevent reduce or offset adverse effects should be considered.
- *Promoting the more efficient use of land through higher density, mixed use development and the use of suitable previously developed land and buildings. Planning should seek to actively to get vacant and underused previously developed land and buildings back into beneficial use t achieve the targets the government has set for development on previously developed land.*
- Reducing the need to travel and encouraging public transport provision to secure more sustainable patterns of transport.

The government recognises that the objectives are broad and states that *" to deliver them, we must focus on specific issues. One way to do that is through indicators. They help to identify areas for action and connections between them"* (DETR, 1999).

Table 1 The UKs Strategic Objectives and Headline Indicators for Sustainable Development.

Maintaining high and stable levels of economic grown and employment
H1 Total output of the economy (GDP & GDP per head)
H2 Total and social investment as a percentage
H3 Proportion of people of working age who are in employment
Social Progress which recognises the needs of everyone
H4 Success in tackling poverty and social exclusion, (children in low income households, adults without qualifications and in workless households elderly in fuel poverty).
H5 qualifications at age 19
H6 expected years of healthy life
H7 Homes judged unfit to live in
H8 Level of crime
Effective protection of the environment
H9 Emissions of green house gases
H10 Days when air pollution is moderate or higher
H11 Road traffic
H12 Rivers of good or fair quality
H13 Populations of wild birds
H14 New homes built on previously developed land
Prudent use of natural resources
H15 Waste arisings and management

Source (DETR, 1999)

Rydin et al (2003, pg. 545) states "*sustainable development is a challenging policy goal. It is a holistic concept covering different policy domains, the environmental, the social, and the economic and integrating them. It deals with the current and the future through the principle of intergenerational equity*". Both Rydin et al (2003) and Hales (2000) question whether the commitment to sustainable development exists beyond the rhetoric and is actually translated into action.

Implementation of sustainable development through planning policy guidance and initiatives has taken the form of many individual policies. The government advice passed through PPGs, Circulars and best practice publications, which are presented as proof of the incorporation of sustainable development have been criticised for being very compartmentalised, departmentalised and detached (Hales 2000 & Cullingworth & Nadin, 2002). There is no one specific PPG with regard to implementing sustainability, but rather different policies are proposed relating to sustainability within each PPG and are evaluated based on different criteria. For example, private car minimisation, the criteria which have been developed applicable to land use planning include reduction of car parking allocations in town centres; ensuring development is close to transport corridors etc (ibid). This ad hoc introduction of generalising sustainability measures through policy becomes even more apparent when looking at the policies with regard to sustainability, Urban regeneration and Brownfield redevelopment, which are of particular interest to this research and examined further below.

As defined in PPS1 the government identifies urban regeneration and brownfield redevelopment as one of the main objectives in achieving sustainable development (Box 1 section 1). Urban regeneration according to the European Commission (1996) involves the rehabilitation of existing structures, redevelopment of buildings and sites or simply the reuse of

urban land, thus being the relevant policy aspect with regard to brownfield redevelopment. However, urban regeneration in order to be sustainable requires more than property led renewal (Hopkins et al, 1997) and this has been recognised by the government with its focus on sustainable communities and the White Paper on sustainable development (DETR, 1999).

The need for urban regeneration is not a new concept. However, an examination of urban regeneration in the 1970s and 1980s if anything has taught us that regeneration must be about more than bricks and mortar (Hemphill, et al, 2002). Hemphill et al (2002) argue that the issue is not about understanding that sustainability should be incorporated into urban policy, but rather developing mechanisms to achieve that integration.

This is in fact a real issue when one examines the plethora of urban policies and initiatives, which are currently being employed with the aim of achieving urban regeneration and thus sustainability. In Table 2 the current initiatives aimed at achieving urban regeneration are presented. It is not however, in the scope of this paper to review the context of these initiatives but a few conclusions of the urban regeneration process can be drawn.

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Table 2: Government Regeneration Initiatives

Policy sustainability issue	Government policy response initiative or programme
Business & Investment	• Business improvement districts • Coalfields Enterprise fund • Community development Venture Fund • Community investment tax credit • Inner City 100 project • Local Tax Re-investment programme • Network Space • New Entrepreneur Scholarships • Phoenix Fund • Public sector research establishment fund • Research and development tax credit • Reducing business rates for small businesses • Regional Innovation Fund • Regional Venture Capital Funds • Science Enterprise Challenge • Small firms Loans guarantee scheme • Stamp duty exemption in certain disadvantaged communities • One hundred per cent tax credit for contaminated land clean up • University for industry (learn direct) • UK High technology fund • University Challenge • Remove VAT burden on sale of renovated houses empty for 10 plus years
Communities	• Active community- matched funding for volunteering • Active Community Funding package Experience Corps • Better Government for Older people programme • Coalfields regeneration trust • Community chests • Fuel duty rebate for some community transport • Home Zones • The Mentoring Fund • Millennium Communities • New Deal for Communities • Neighborhood Renewal Fund • New opportunities Fund Green spaces and sustainable communities programme • New Opportunities Fund Transforming Communities Programme • Neighbourhood Support Fund • Reallocation of Lottery Community Projects Fund • Sure Start local programmes • VAT relief for listed buildings that are places of worship
Crime & Communities	• Crime & Disorder Partnerships • Crime reduction programme • Expansion of closed circuit television • Neighbourhood wardens • Projects to reduce domestic burglary

	• Safer communities Housing fund
Education & training	• Advanced Modern Apprentiships • Catch-Up programmes • Childcare tax credit payments to increase employment take up • City academies • Connexions service • Creative partnerships • Education action zones • Employment zones • Ethnic minority Acheivement Grant (EMAG) Programme • Excellence in Cities and Excellence challenge programme • Extended Mortgage Interest Income support run on • Higher education innovation fund • Job grant • National child care strategy • New deal programme for the 50+ • New Deal for schools capital funding • Paid time off to pursue qualifications • Pilot education maintenance allowance • RDA regional skills development funds
Environment	• Environmental Action Fund • Environment Task force option of the new Deal for Young People • Heritage Economic Regeneration Schemes • Heritage Lottery Fund urban parks + townscape heritage initiatives • Home energy efficiency scheme
Health & well-being	• Health Action Zones • Health Improvement Programmes • Healthy Living Centres
Homes & Housing	• Home buy an shared ownership schemes • Housing renewal areas • New strategy for rough sleeping • Starter home initiative for key workers • Supporting people programme
Sports & Leisure	• School sport co-ordinators • Space for sport and the Arts Scheme • Sports Action Zones
Transport & traffic	• Pilot Clear zones • Road maintenance and street lighting • Urban Bus challenge Fun

Source : Compiled from ODPM Website http://www.odpm.gov.uk/

Cullingworth & Nadin (2002) argue that the plethora of urban policy and regeneration initiatives are disjointed, thus presenting a great difficulty when organising a coordinated effort to tackle specific issues with regard to sustainable urban regeneration. In fact as can be see from Table 2 although it can be argued that the approach is thorough, covering all the

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areas with regard to sustainability in context, the compartmentalisation and specificity of the initiatives counters the context thoroughness of the approach. Gibbs (1997) argues that although there has been a tendency to integrate urban regeneration and sustainability policy this has been done at a superficial level, with economic development priorities still having the main role.

With regard to the main contextual thrust of urban policy, we see a move towards urban intensification with the increase of dwelling densities, mixed use and reuse of brownfield land (PPG3 2000, Urban Task Force, 1999, DETR, 2000, Williams et al 1996, & Williams 1999). There has been a lot of theoretical support with regard to intensification in the literature, with many people describing it as the way forward with regard to the concept of the sustainable "compact city" (Sherlock, 1996, Haugton, 1997). The main arguments for having urban containment are, to protect the natural environment from urban sprawl (CPRE, 2000), the reduction in the need to travel distances with a consequent reduction in emissions from vehicles. The DETR (1998) also argues that higher densities would make public transport more viable.

However, there are arguments against intensification with regard to sustainability. For example Breheny, (1992) and Jenks et al (1996) point out that the compact city could result in overcrowding, increase in traffic congestion and pollution, which are not elements compatible with the government's concept of " better quality of life". In a research conducted by Jenks & Gerhardt (2000), it was identified that the intensification and sustainability of the compact city varied according to the characteristics of the local area in which it was undertaken. This leads to the understanding that urban regeneration as proposed by the government should not be taken as de facto sustainable, but rather there needs to be a consideration of

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existing local circumstances as well as ongoing monitoring to ensure the effectiveness of the various initiatives

4.2 The role of Brownfield regeneration in Land use planning policy.

Brownfield redevelopment is now at the heart of the UK Government's urban policy (Adams & Watkins, 2002) and is part of a strategic planning approach to achieving sustainable cities (Dair & Williams 2004). Redeveloping Brownfield sites is one of the core objectives to achieve sustainable communities (ODPM, 2004)(box 1) and this is reflected in a number of strategic guidance and policy documents (Egan Review 2004, DTLR 2000, PPS1, PPG1, PPG3). In planning policy and guidance it is argued that brownfield redevelopment can provide the opportunity to create a more spatially integrated, mixed use environment but also to introduce resource efficient, high quality buildings (DETR, 1998a).

The Government has assumed brownfield redevelopment to be the equivalent of sustainable development, and this is demonstrated with the governments "headlining" new homes on previously developed land as one of the most important indicators of sustainable development (DETR, 1999) (Table 1).

However, Adams & Watkins (2002) and Dair & Williams (2004) argue that just because development is on a brownfield site it doesn't necessarily make it sustainable. Firth (2001) points out that even supposedly derelict sites can be rich in fauna and flora. Many of the derelict sites can provide open space, which the local community use for their recreation or which they have become accustomed to and do not necessarily wish to see redeveloped.

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Adams & Watkins (2002) point out that a housing development on a Greenfield site which meets best practice standards with regard to design,

energy efficiency, water conservation may be more sustainable than a poor quality development on a brownfield site. Furthermore, they have identified that a lot of new housing on brownfield sites is of poor quality, and recommend that the sustainability of brownfield developments should not be taken for granted. Both Dair & Williams (2004) and Adams & Watkins (2002) point out the importance of examining the sustainability of a proposed brownfield development based on the local context.

Taking for granted the sustainability of brownfield development purely based on location, could have major implications when considering the target set by the Government for 60% of all new housing development taking place on brownfield land (DETR, 1998) and the need for 3.8 million new households being required by 2021 (Urban Task Force, 1999). In its report the Urban Task Force identified the issue of regional differences with regard to achieving the 60% target, identifying the greater supply of brownfield sites is in the Midlands and the North whereas the greater demand for development is in the South East. These areas face different policies to an extent, different market forces and have different location requirements, although they both face the challenge of meeting the same 60 percent target. It is therefore questionable that this brownfield redevelopment target is necessarily sustainable when it fails to take into account local conditions.

With regard to sustainability which is stated in the main principles of planning and expressed in the objectives (box 1) Cullingworth and Nadin (2002) argue that there has been only a partial and fragmented conversion of the principles into planning policy and actions. They also claim that policy compartmentalisation and departmentalism are strong barriers to effective integrative approaches to sustainable development. In its Green Paper (DTLR, 2001 par 4.5 pg 12) the government realises this and states that "there are too many inconsistencies. Too often local plans are

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inconsistent with policies set out at the regional or national level. If there a policy changes at a higher level, a plan can be overridden when planning decision are made. This makes it hard for those using the system to be confident that they know what policies apply". Hales (2000 pg 103) states that "increasingly one is able to detect an uneasy division between strategic direction and application manifesting itself in central government guidance and advice to those responsible for regulation on the ground-the local planning authorities". A representative example is that of the strategic policy direction for brownfield development, which is also being purported as sustainable development, but at the same time finding opposition at the local levels. Adams & Watkins (2002) and Dair & Williams (2004) identify the need to take into account the local conditions as well as consult widely with the community, claiming that sustainability should be assumed purely on the basis of development location.

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A further criticism of policies with regard to sustainability is that they tend to place emphasis on the economic or socio-economic development while marginalising environmental considerations. An example is the Thames Gateway area where although sustainability is purported to be integrated within the area RPG9a regional PRG9 policies, we see a strong emphasis on economic development and the push for economic growth (SERPLAN, 1998). Hales (2000), comments on the ability of the planning system to make decisions with regard to development, without having to choose between different conflicting policies. So there is still a situation in current practice after 20 years of sustainability talk of economic growth vs sustainable development (Cullingworth & Nadin, 2002; Hales, 2000).

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The above conflicts in policy levels and context Rydin et al (2003) attribute to the different perceptions of the concept of sustainable development. Hales (2000), points out the importance of defining the sustainability

objectives of any regeneration project or development and Hemphill (2002) points out the need to monitor progress towards achieving them.

5. Land Use planning processes currently implementing and monitoring sustainable development.

Having examined the UK government policy with regard to sustainability, urban regeneration and brownfield redevelopment as well as their contextual limitations, meaning the issues of contradiction, fragmentation etc, it is important to outline the planning mechanism and processes through which sustainability policies are implemented, especially with regard to the development control process. The UK land use planning system is undergoing reform and some of these changes are examined with regard to their implications for sustainability implementation and monitoring.

5.1 The planning process & sustainability implementation and policy monitoring.

Sustainable development in planning has been promoted through the adoption of Local Agenda 21 (LA21), which should provide the direction and indicators to monitor progress towards sustainable development. LA21 requires Local Authorities (LAs) to prepare a local development strategy using extensive consultation of the local community to obtain input on how progress can be achieved and measured. Cullingworth & Nadin (2002) conclude that this open participatory approach often leads to the strategies being developed in a way that they lack clear direction and purpose, thus reducing their utilisation in planning decisions. Furthermore, LA21 is voluntary and does not hold any legal or statutory weight especially in land use planning and development control

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(Cullingworth & Nadin 2002) and thus as identified by Doak (1998) is rarely explicitly considered in development control decisions.

Planning Policy Guidance notes (PPGs) and more recently, Planning Policy Statements (PPSs) provide a national framework for planning. PPGs set out the Governmental policies on different aspects of planning. They must be taken into account by local planning authorities as they prepare their development plans. The current planning system is plan-led, which means that if planning applications are in accordance with the development plan, they are likely to be approved. Regional Planning Guidance (RPGs) provides a strategic planning framework in each of the eight English regions and in London the Mayor prepares a Spatial Development Strategy. Development plans are produced by county authorities (structure plans), district councils (local plans) and in unitary authorities, a unitary development plan which combines elements of both. In producing development plans the relevant authorities need to take into account policies at the national and regional levels (DTLR, 2001)(Figure 3).

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From the above, the importance of the way sustainability is interpreted in national and regional policy becomes apparent, especially with regard to the sustainability of future developments. However (Hales, 2000 pg 116) in a survey of local planning authorities concluded that 'Efforts to incorporate sustainable development into development plans and their preparation is still very much in its infancy'.

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One of the main processes available for the incorporation of sustainable development into the different development plans is through sustainability appraisals, environmental appraisals and more recently Strategic Environmental Assessment of development plans. In 1993 a number of techniques and procedures which LPA could use to appraise their

development plans where set out in *Environmental Appraisal of development plans* (DOE, 1993). Since then the methodology for doing so has evolved further guidance for which was provided in the Government's *Good practice Guide on sustainability appraisal of regional planning guidance* (DETR, 2000). This methodology is objective-led and qualitative in style and is aimed to be carried out in parallel with evolving policies and proposals in development plans. However, in an examination of the current UK approach to sustainability and environmental appraisals George (2001) identified a lack of clarity between the relation and integration of planning and appraisal processes limiting its effectiveness so far.

Strategic Environmental Assessment (SEA) which is the implementation of the European Directive 2001/42/EC required by member states by July 2004, is a new and arguably more robust form of sustainability appraisals. The Government Guidance document ' *A draft practical guide to the Strategic Environmental Assessment Directive*', (ODPM 2004c) provides clear steps in evaluating the sustainability of proposed plans and stresses the importance of carrying out this process as an integral part of the plan development process rather than a separate assessment exercise. The implications of where it can help introduce sustainability is illustrated in Figure 3. As is illustrated in Figure 3, SEA is required to be carried out for difference plans and guidance at different levels therefore creating the opportunity for a continual systematic consideration of sustainability issues. This is also important when considering the monitoring provision set out through the Directive. The importance of designing in monitoring processes and adopting a participatory approach with guidance on how to achieve that are provided in ODPM (2003a), thus creating a brilliant opportunity for a systematic and non fragmented approach to policy sustainability monitoring and evaluation. However, it is still too early to be able to judge the effectiveness of this process although it is proposed that any sustainability evaluation processes at the site specific and development

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level should draw guidance and be integrated into the SEA process. One final issue with SEA is that it is in fact an environmental and not sustainability assessment. However, through the guidance provided, attention to socio and economic issues is also proposed. This issue has also been raised in consultation document '*The draft environmental assessment of plans and regulation 2004 : a consultation document* ' (ODPM, 2004d) and requires further investigation as to its implementation.

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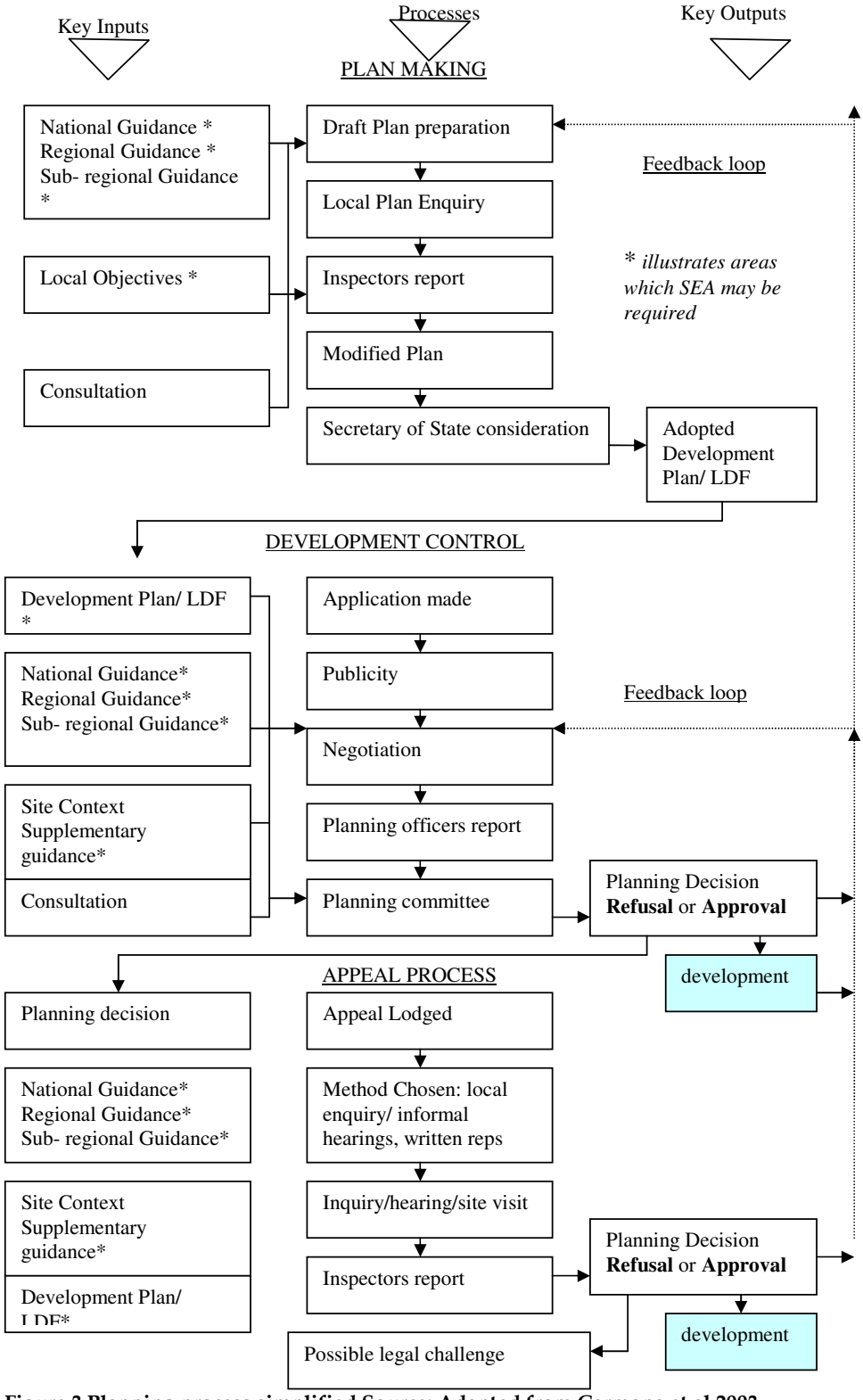

Figure 3 Planning process simplified Source: Adapted from Carmona et al 2003,

As outlined in section 3, a brownfield redevelopment in the initial phase in order to proceed will have to obtain planning permission and therefore go through the planning application process (Figure 3). Depending on the nature of the project, there are a number of areas where sustainability can be introduced through the planning application process. The main ones are through the consideration of planning policies and guidance, the meeting of the various building, pollution control and Environment Agency regulations as well as through the undertaking of an Environmental Impact Assessment (EIA) and preparation of an Environmental Impact Statement (EIS) should this be required (see section 6).

When making a decision whether to accept or refuse a planning application, the relevant planning officers need to take into account existing policies in the local plans, any supplementary guidance, and material considerations such as new national policies for example PPG3 (2000) (Cullingworth & Nadin, 2002). The policies as discussed in section 4 cover a variation of thematic topics, which essentially contribute to sustainability, such as noise, public transport provision, open space, densities etc, although in a fragmented manner. As noted by Dair & Williams (2004 pg 14) "*almost without exception, development applications give rise to conflicting views on the merits of the development proposal*". However, it needs to be pointed out that there is not an official systematic examination of proposed brownfield developments sustainability in this process. A planning proposal can only be refused should it contradict specific policies. In Rowan Robinson et al (1995) in a study of how development control could deliver sustainable development it was identified that development control officers, due to the nature of the process, had difficulty in determining whether a proposal will be sustainable as well as justifying negotiating elements of sustainability. Hales (2000) identifies the pressures on planning officers to make decisions involving the sustainability of proposed developments without having clear guidance on such issues,

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especially when political and economic pressures are involved. This problem is especially acute when considering the eight week deadline development control authorities are set to deal with most planning applications. Therefore, Gwilliam (1993) proposes the need for the introduction of practical tools to integrate sustainability, that form the basis of planning decisions at the technical and political level. Since the introduction of SEA, it is considered that specific mechanisms to link the planning application process to SEA should be introduced which would ensure the integration of sustainability.

5.2 Review of urban policy evaluation and monitoring practices

There is a plethora of indicators developed to monitor sustainability at an international, national, regional and local level, for example key performance indicators at the national level, and Local Agenda 21 and Best Value indicators at the local level. Although the importance of these indicators is not disputed the actual use of the information and its dissemination is questioned as well as the integration of the information and focus throughout the different levels.

Specifically with regard to the evaluation and monitoring of UK Urban policy, this is a process which has been ongoing for more than thirty years. In a review of evaluation practice of Urban Policy Ying Ho, (2003) identifies that in the 1970s there was limited progress with regard to evaluation and monitoring as information was not carried on to future evaluation programmes. Ying Ho (2003) criticises the 1980s approach which was based on a value for money approach and describes the 1990s as static although identifies the role of monitoring as a specific requirement to obtaining funding and discusses the significance attributed to monitoring in 1997 with the introduction of Best Value. According to the DETR (1995 &

1999a) however, progress is acknowledged with the introduction of the two evaluation strategies in 2002 (ODPM, 2002a) (ODPM, 2002b).

It is clear that urban policy evaluation is undertaken at different levels but even today it remains top-down and strictly regulated by the government. In a study conducted by KPMG, (2000) the conclusion was drawn that officers at the local authority level found monitoring very cumbersome and did not use the information to draw conclusions as they did not find the contents of the monitoring relevant since they where dictated by the government. On the one hand this approach is understandable as urban policy initiatives are developed by central government but implemented at the local level thus there being the need for monitoring information to facilitate programme management and policy evaluation (Ying Ho, 2003).

However, even the government in its Urban White Paper (DETR, 2000) recognises the significance of local evaluation as a learning tool, rather than purely for meeting the requirements and targets set by the government but unfortunately the issue of how to achieve this is not addressed. Ying Ho (2003) points out the importance of involving the local level and community in the development of monitoring and evaluation processes of regeneration initiatives but also stresses the need for coordination and integration between the different schemes to avoid duplication of effort.

Although brownfield development is a sustainability indicator in itself (table1), it was identified in section 4 that the sustainability of such development should not be taken for granted and that there is a need to monitor the sustainability of such projects. Primarily, there needs to be an examination of how the monitoring of sustainability of brownfields is occurring, if at all.

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As was identified from the relevant sustainability and urban regeneration policy and initiative review (section 4), there is the issue of fragmentation and lack of cohesion which is inhibiting the effective implementation of the sustainability concept. This fragmentation however also poses problems to the evaluation of the actual policy and initiative effectiveness (Cullingworth & Nadin, 2002). It is argued that although there has been a constant flow of new urban regeneration initiatives there has been little in the form of systematic evaluation of their actual impact (ibid). Cullingworth & Nadin (2002) point out that where monitoring of initiative impacts is undertaken this is mostly done on a piecemeal basis taking into account mainly economic impacts. Therefore, an important question which arises is how can we be sure that the current proposed initiatives which have been addressed as synonymous with sustainability, are actually sustainable when monitoring is not holistic taking into account mainly economics and when even these measures are halted due to the disjunctive nature of the initiatives?

In a review of the evidence base for urban regeneration initiatives and policy conducted by the DETR (2001a), conclusions where drawn over the general lack of evidence. They state that where present ' *evidence is largely constructed on empirically based research of case studies, often seeking to identify examples of good practice, rather than testing causality or long term impacts of policy measures* (DETR, 2001a pg80). Another criticism emerging was the lack of longevity in monitoring and the short term focus on output of initiatives like those in table 2 rather than outcomes. The failure of evidence with regard to sustainability impacts and changes over time to the community and areas affected by the initiatives and policy was a major conclusion. Recommendations, included the introduction of a more long term systematic monitoring strategy, funds for which should be allocated at the initiation of any project. The need to create direct information

feedback mechanisms, which are able to transfer outcome results from the local level to government policy level, was also stated (ibid).

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5.3 Changes in Land use planning and implications for sustainability implementation and monitoring.

Having identified the importance of policy and planning with regard to sustainability and brownfield regeneration, it is thus deemed important to outline the changes occurring in the land use system and identify the implications or opportunities with regard to procedural integration of sustainability.

The changes with regards to the operation of the planning system as proposed in the Government Green Paper (DTLR, 2001) and as summarised in the Egan Review (ODPM, 2004a, pg 39) are presented below:

- "*Putting sustainable development at the heart of planning through the statutory requirements in the Bill and making it the key principle of national policy in PPS1;*
- *Creating a more effective system for determining the broad distribution of new development at the regional level, with better integration of land use, transport and economic planning together with greater devolution of responsibility for policy formulation;*
- *Removing a tier of plans and simplify and speed up the local planning process, with a more flexible and responsive system setting out core policies and more locally focused action plans for new settlements, regeneration areas urban extensions etc;*
- *Introducing a framework for stronger, more interactive community involvement at a formative stage in producing policy and plans, in pre-*

application discussions with developers in preparing their proposals and in actively engaging with community groups; and

- *Providing a variety of new tools (planning zones, local development orders; improved Compulsory Purchase Orders powers) which will facilitate the assembly of sites and speed up the process of delivery whilst 'front loading' community involvement."*

The Green Paper (DTLR, 2001) proposes the abolishment of structure, local, and unitary development plans and replace them with a new single level of plan the Local Development Framework (LDF). Although this system is proposed for simplicity it then proposes the development of action plans, which include area master, plans neighbourhood and village plans, design statements and site development briefs. Furthermore LAs will also be responsible in developing community strategies which ideally should inform the LDFs. Although there is emphasis on the importance of the local level, which is a perquisite in achieving sustainable development (Dair & Williams 2004) '*especially with regard to brownfield development increasing emphasis is placed on regional planning policy*' (ODPM, 2001 para 4.39 pg 20).

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In the name of sustainability and the integration of social, environmental and economic considerations RPG is proposed to be replaced by Regional Spatial Strategies (RSS), although how the integration is more likely to be achieved through this change is not clearly demonstrated.

Arguably one of the most important points proposed in the planning reform is the increased emphasis in public involvement, which is even proposed at the pre-application phase of major developments (DTLR, 2001). This role is encouraged in the EGAN Review, although it is identified that this new approach will '*require the development of new skills and methods in interacting and listening to communities and in working with them to secure the optimum benefits from development*' (ODPM,2004a,

para2.48). Community participation is an essential element of sustainable development and is welcomed; however, concern arises as to how this is to be achieved. It is a common known fact that community involvement is a timely process. The government in the same report which it promotes increased participation (DTLR, 2001) proposes a significant reduction in the time required to process a development application, the achievement of both is somewhat questionable.

The Egan review (ODPM, 2004a) in response to the Green Paper (DTLR, 2001) identifies the increased importance in monitoring progress in achieving sustainable communities, and proposes yet another set of indicators. Although the increased emphasis on monitoring and evaluation is applauded, the above (section 5.2) examination into urban policy evaluation and monitoring practices identified a number of issues and shortcomings which are yet to be addressed.

6. Land use planning processes available for the implementation and monitoring of Brownfield Redevelopment Project (BRP) Sustainability.

So far the policy background to sustainability and brownfield regeneration has been examined as well as its limitations. The planning process from plan development to the planning application process have been described identifying the inconsistencies and difficulties in implementing sustainability. However, there are present mechanisms within development control, through which explicitly or implicitly sustainability can be implemented with regard to a specific development and which are also applicable to brownfield redevelopment projects. The potential of these processes to introduce or require long term sustainability monitoring is also examined as well as the scope of this potential monitoring's

integration into planning policy formulation and plan development. These development control processes are namely planning gain, EIA and regulations. They are examined in detail below.

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6.1 Implementing and monitoring BRP sustainability through the use of planning gain.

An important part of the planning application process is the negotiation period (Figure 3 section 5). This essentially relates to the negotiation of planning gain or planning obligations, conditions or agreements, with regard to the proposed development (see DoE, 1997 & DoE 1995). "*The term planning gain can denote the provision of facilities which are an integral part of the development, but it can also mean 'benefits' which have little or no relationship to the development, and which the LA requires as the price of planning permission* "(Cullingworth & Nadin, 2002 pg 166).

Planning conditions and agreements are often used for the provision of affordable housing. Developers are expected to provide affordable housing on developments above a certain size (ibid). Crook et al (2001) identified that 89 per cent of planning authorities had developed an affordable housing policy within their local plan, thus demonstrating to potential developers their intentions to require such planning gain. However, the agreement on the provision depends on the negotiating power for S106 of the LPA which in turn is related to current and local economic conditions (Marvin & Guy, 1997, Cullingworth & Nadin 2002, Carmona et al, 2003). For example, negotiating powers in London or in the South East where there is increasing pressure for development and housing costs are high, are much stronger in relation to the North where there is considerable difficulty in attracting development (Cambell et al 2000, Carmona, et al 2003, Cullingworth & Nadin, 2002).

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However, planning gain extends further than just the provision of affordable housing. It now has a vital role in providing infrastructure especially since the privatisation of public services (Marvin & Guy, 1997). Providing for road infrastructure, gas, electricity, water etc, is a commonly excepted planning obligation of the developers, which in turn becomes a negotiation process between developers and service providers (ibid). In a sense however, this distances the ability of LPAs to stipulate the choice of service provision, especially with regard to environmental considerations, as they are not involved in the decision-making for example choosing a more environmental friendly service provider.

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Campell et al (2000 pg 759) in a review of planning obligations identified that " *a significant widening of the use and scope of planning obligations has occurred in the last ten years. Obligations are used not only to remove physical constraints on development and to mitigate direct development impacts, but also to ameliorate more diffuse social, economic and environmental impacts, to provide community benefits and to support wider policy objectives*". The Urban Task Force recognises the potential of planning obligations to provide for quality and management improvements in the urban environment. The RICS (1991) identified the potential of planning agreements with regard to major developments in providing benefits to the community particularly when there is a loss of amenity.

From the above it is understood that, with the consideration of planning gain, a brownfield redevelopment could in fact have impacts reaching beyend the development itself and thus with regard to sustainability implementation, planning gain provides a major opportunity. However, there has been an increasing debate over the "*extent to which local authorities can legitimately require developers to shoulder the wider costs of development: the needed infrastructure, schools and other local services.*"(Cullingworth & Nadin, 2002 pg 166). Cambell et al (2000 pg 760) state that " *developers are faced with*

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a proliferation of different types of approaches and charges in different areas which have evolved in an ad hoc manner" they also state that " *Short-term planning gains are tending to override longer term planning concerns such as environmental quality* (ibid, pg 759)". The need for a systematic predictable approach to planning gain has been long expressed by developers (Carmona et al, 2003).

In the Green Paper (DTLR, 2001) it is proposed that LPA 'develop a planning checklist so that people know how to submit a good quality planning application (DTLR, 2001 pg 29). Since then a number authorities have also developed sustainability checklists to measure the sustainability of developments (Starck, 2003). These checklist in many ways can help guide and potentially be used as a basis for the creation of planning gain requirements in the form of Section 106 agreements relating to sustainability. However, these checklists rarely consist of material planning considerations, vary substantially between LPA and therefore are still faced by the issues of development control capacity to consider sustainability through standardised processes.

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Thus far as identified by Cambell et al (2000) planning obligations are not determined in a systematic manner, and although the local plan is used as a basis there is no assessment of the sustainability of the obligations. Furthermore, there is no evaluation of the actual effectiveness of the completed planning applications. An opportunity is therefore identified to introduce a systematic monitoring scheme to evaluate the sustainability of brownfield redevelopment projects, including their related planning obligations. By identifying the full sustainability implications of proposals, planning obligations can then be proposed, to mitigate for them. A systematic participatory monitoring framework would help identify the real impacts of a proposal and help in the stipulation of relevant planning

obligations, with a core element of sustainability, rather than supporting specific LA officers' or members' pet projects.

It is envisaged and hoped by the authors that through the introduction of SEA and all its evaluation and monitoring requirement and area specific sustainability targets, considerable scope will be created for the evaluation and consideration of planning gain proposals in light of sustainability. However, there will be the need for a structured framework to be implemented to allow that, such a framework is proposed in (Pediaditi et al, 2005). Furthermore, with regard to monitoring of long term sustainability there is considerable scope for S106 agreements to be developed obliging developers to monitor the sustainability of their developments. Initial experience of such activities has been gained through the introduction of Green Travel plans which require developers to monitor their effect on transport. However, the issue of who utilises the results obtained from the monitoring and what remedial actions can be taken should issues be identified arises.

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6.2 Implementation and monitoring of brownfield sustainability using EIA

EIA is a procedure introduced into the British planning system a result of EC Directive 1985 (85/337) and implemented for England and Wales through Environmental Impact Regulations 1999 SI no 293 to assess the environmental impacts of developments. EIA is a process, which requires the production of an Environmental Impact Statement (EIS), through the gathering of information the environmental effects of a development from a variety of sources such as the developer, LA, statutory consultees and third parties. Although the focus is mainly on environmental impacts, such as noise, ecology, traffic, air pollution etc; social impacts are also considered, when stipulated in the scoping study (Weston 1997, Morris & Therivel, 1995). However, there is criticism of the weak treatment of socio-

economic impacts in EISs and also the subsequent lack of monitoring of these issues (Glasson & Heaney, 1993 & Glasson et al, 1999 & Glasson 1995 in Morris & Therivel).

EIA has the potential to improve the sustainability of a development as it has to take into account the proposed site, the development the predicted impacts and proposal of mitigation measures to minimise negative impacts (Glasson et al 1999, Weston 1997). This may be the case, provided that a holistic approach is adopted taking into account socio- economic impacts too. Furthermore, there is a requirement for EIA to include public participation, another sustainability requirement which unfortunately in most cases is limited to the public enquiry and publication of the EIS. Moreover, best practice literature on EIA recommends the introduction of monitoring processes to assess the efficiency of mitigation measures (Glasson 1994, Glasson et al 1999). However, Chadwick & Glasson (1999 pg 811) state that EIA "*at its worst is a partial linear exercise related to one site, produced in-house by the developer with little public participation. There is a danger of a short-sighted 'build it and forget it', with little attention paid to the actual impacts which result from projects once implemented*".

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With regard to sustainable brownfield redevelopment EIA is a potentially very beneficial process. However, not all brownfield developments require an EIA (only those listed in Schedule 1 & 2 of the Regulations), which are expected to give rise to *significant* environmental impacts (Cullingworth & Nadin, 2002, Weston, 1997). Therefore, this process could not be applied to improve and assess the sustainability of all brownfield redevelopment projects, although where applicable it can prove to be beneficial (Glasson et al, 1999). However, elements can be drawn from this process and there is also room for improving the EIA process it self.

Glasson et al, (1999) propose that EIA should not stop at the decision to grant planning permission, but rather should be a means to obtain good environmental management over the life of the project and thus stress the need for follow-up monitoring and auditing work in the EIA process (Glasson, 1994). It is thus proposed that S106 agreements are used to require a participatory sustainability monitoring framework such as that described in Pediaditi et al (2005) to be introduced through the EIA process to monitor the long term sustainability impact of the proposed development as well as the efficacy of the proposed mitigation measures. This would not only enhance the participatory nature of the process which has been heavily criticized (Weston, 1997 & Morris & Therivel, 1995), but also provide important feedback for future proposals on the efficacy of mitigation measures and impact predictions (Chadwick & Glasson, 1999). With regard to the participation element of the framework proposed in Pediaditi et al (2005), a clear benefit is identified as the opportunity is given to stakeholders to express their views and aspirations while identifying which their greatest concerns with regard to sustainability which they would like to see monitored. Thus the argument is shifted from the nature of the development.

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The authors identify further scope in EIA long term monitoring. Should EIA post monitoring requirements be integrated to SEA sustainability indicators, a mechanism as proposed in Pediaditi et al (2005) would be created for development scale information to be fed into local and ultimately regional and government policy, thus reducing the fragmentation of the policy evidence base as discussed in section 4. However, this would require a coordinated approach as well as LA resources for collating and interpreting the information provided.

6.3 Implementing and monitoring brownfield sustainability through Regulations.

During the planning application process a developer will have many matters to consider with regard to regulation and obtaining licences, either for the construction, remediation or operation of the development. There is a whole variety of regulations, covering issues such as energy efficiency, accessibility etc, and thus it could be considered as a way of implementing sustainability. Specifically with regard to Brownfield sites in the case that there is contaminated ground the number of regulations and licences required is substantially larger, and thus there is potential for sustainability implementation to occur through compliance with these regulations (See DEFRA & EA, 2004). However, there are limitations to the ability of regulators to improve the sustainability of developments as identified by Williams (2003). The views expressed by regulators in interviews conducted by Williams (2003 pg 344), were that "*they felt they lacked the powers to enforce best practice*". It is recognised that regulations are becoming more stringent with regards, for example, to requirements for fuel and power conservation (HMSO, 2000 & BRE, 2001). It has been identified that although stipulations could be made through regulations with regard to the maximum discharge rates for surface waters to watercourses, regulators do not have authority to stipulate the means to achieve that rate, for example, through using environmentally friendly technologies (ibid). Furthermore, regulations are not locally derived but nationally and therefore local circumstances cannot be taken into consideration. However, the data which is obtained with regard to a development is standardised and may potentially serve as an important source of information with regard to sustainability monitoring. Community participation is very limited if at all in this process, which is also another indicator of its inflexibility. However, in combination with the other processes there is potential to implement sustainability, although improvements are required, especially with regard to process integration, participation and monitoring.

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7. Conclusions and recommendations.

An examination of a BRP land use life cycle signified the importance and potential of land use planning to affect the sustainability of projects. The exploration into the relationship of the concepts of sustainability, and brownfield regeneration in planning policy revealed a close interrelation at least at the theoretical level. Sustainability is claimed to be the core aim of planning, and brownfield redevelopment is seen as an indicator of sustainable development and promoted through various planning policy and guidance documents. However, it was demonstrated that not all brownfield redevelopment projects are sustainable and that in fact there is a need for long term monitoring.

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An examination of the evidence base on which policy and urban regeneration initiatives are based was found to be flawed, characterised by fragmentation, limited information based on best practice examples rather than standard projects as well as a lack of long term monitoring of the outcomes of these initiatives. Fragmentation, also characterised policy guidance and the various initiatives which fail to address sustainability in a holistic manner. Fragmentation was found between different policies which could end up being contradictory eg economic growth vs environmental protection but also between the different planning levels from government to LPA. An examination of the planning processes in place to implement the policies indicated a chasm between sustainability theory and practice. A lack of clear implementable mechanisms being applied to bring sustainability into practice was identified at both the development plan and development control level. LA21 although laudable for its participatory approach until now has failed to be clearly linked to development plans and development control planning decisions and is rarely considered as a material consideration. However, potential to implement sustainability into plan development was identified through the

newly introduced SEA process, the outcomes of which still remain to be seen. SEA provision for sustainability monitoring also proved promising, although mechanisms need to be developed to link the development control planning application process to SEA objectives and monitoring procedures. This is proposed through the use of the Redevelopment Assessment Process which is a participatory long term monitoring framework described in Pediaditi et al (2005). The development control planning application process was examined in detail idenitifying current mechanisms in place through with sustainability and be implemented and monitored. The mechanisms identified are planning gain, EIA and regulations although they all face shortcomings. The lack of a systematic process for assessing the sustainability of developments when making a planning application decision was identified as the main issue which could be over come through the implementation of the RAF (Pediaditi et al, 2005). The need for systematic sustainability assessment however extends to the need long term monitoring of BRP effects something currently provided for again proposed through the use of the RAF.

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