

# Green Infrastructure: Guide and Toolkit

A report prepared by *emda* and AMION Consulting

2008

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This document forms part of the *emda* Knowledge Bank

With thanks to AMION Consulting who produced this research on behalf of *emda*

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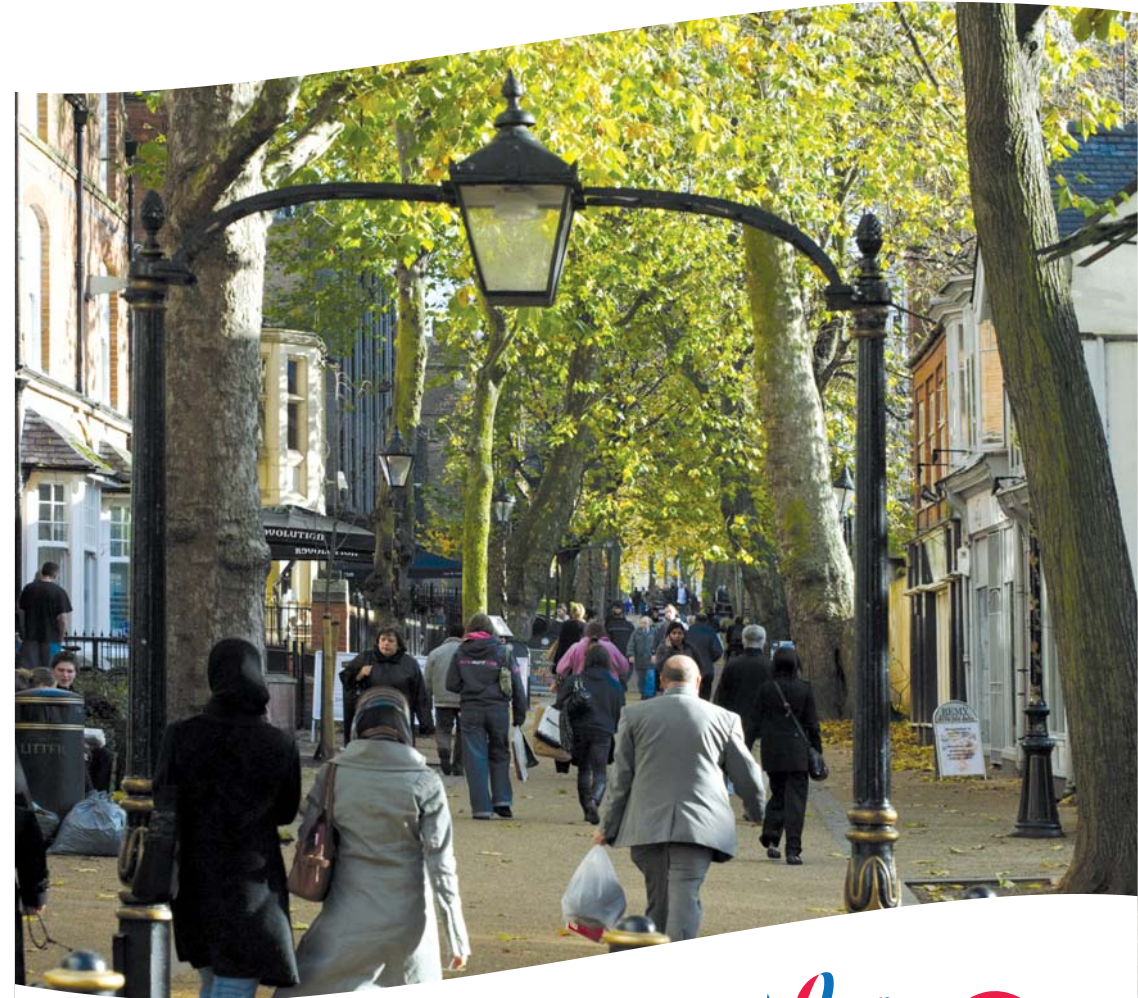
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a guide and toolkit

# green infrastructure

playing an important role in achieving sustainable economic growth and creating attractive communities where people want to live.



<b>Your guide to green infrastructure projects</b>	<b>03</b>
Who is it for? What is it for? How to use it?	07
What is green infrastructure	08
Types of green infrastructure	08
The role of green infrastructure	09
Benefits of green infrastructure	10
Rationale for intervention	17
Beneficiaries of green infrastructure	18
<b>Evaluation framework for existing projects</b>	<b>20</b>
Approach to evaluation	22
Research methods	23
Evaluation analyses	24
Logic chains	25
Relevance	28
Outputs, outcomes and impacts	29
Gross to net additionality	29
Strategic added value	30
Distributional analysis	30
Value for money	31
Reappraisal of the business case	32
Sustainability	32
Lessons learned	33
Reporting arrangements	34
<b>Assessment framework for future projects</b>	<b>36</b>
Initial assessment checklist	37
Full assessment checklist	38
Identifying investment priorities	40
Conclusion	41

## Introduction

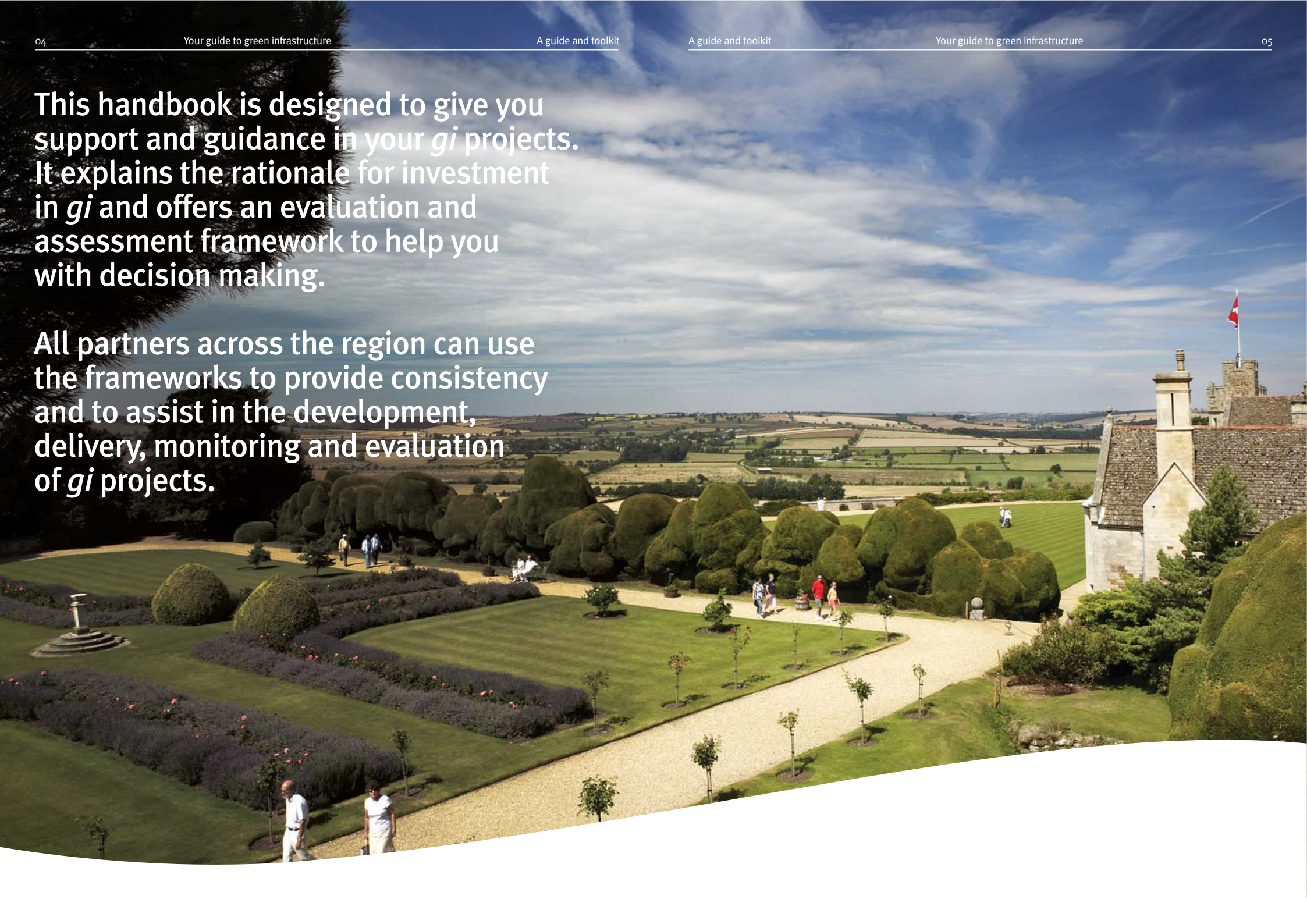
### Your guide to green infrastructure projects

Recent research carried out on behalf of East Midlands Development Agency (*emda*) ‘Green Infrastructure Programme’ (AMION Consulting, 2008) has highlighted that green infrastructure (*gi*) projects are becoming more and more important in regenerating areas, reviving communities, and attracting investment. Ranging from parks and public gardens to agricultural land, these developments can bring key economic benefits, such as increased property values and job creation and retention, as well as boosting tourism and visitor spend.



This handbook is designed to give you support and guidance in your *gi* projects. It explains the rationale for investment in *gi* and offers an evaluation and assessment framework to help you with decision making.

All partners across the region can use the frameworks to provide consistency and to assist in the development, delivery, monitoring and evaluation of *gi* projects.





## Who is it for? What is it for? How to use it?

### Who is it for?

This handbook is produced for the benefit and use of local authorities, sub-regional partners, commercial businesses and other partners across the East Midlands who are involved in bringing forward *gi* projects.

The assessment framework will assist partners in identifying potential *gi* projects while the evaluation framework will assist partners in evaluating the economic, social and environmental outcomes and outputs of existing *gi* projects.

Together, the assessment and evaluation frameworks will assist investors in pulling together and making applications for funding and then delivering successful schemes. Project teams can use the information to provide guidance and consistency of approach in the development, delivery, monitoring and evaluation of *gi* projects.

### What is it for?

This handbook provides an essential reference source for teams delivering *gi* projects and in understanding and capturing the economic benefits.

The handbook will assist in justifying and assessing investment in projects that are centred on or include elements of *gi*. Using the handbook will assist application and approval of funds by providing the economic justification.

### How to use it?

**This handbook provides a resource for research and towards making a formal application for funding as well as a checklist for developing *gi* projects.**

It can be used in a flexible manner or applied more rigidly as a working tool for managing the project to a successful completion. The handbook will also be of significant use to organisations attempting to meet the priorities of the Regional Economic Strategy and delivering its objectives.

## What is green infrastructure?

“A network of multi-functional greenspace provided across the region... *gi* consists of the core network of protected sites, assets and ecological functional landscapes and linkages.”

“The open environment within urban areas, the urban fringe and the countryside. It is a network of connected, high quality, multi-functional open spaces, corridors and the link in between that provide multiple benefits for people and wildlife everywhere.”

“*gi* includes both public and private assets and ranges from inner urban areas to remote rural parts of the East Midlands. Its function depends on its scale, form and location, with many elements having multi-functional purposes.”

For example, in an urban setting its role may be to complement the built environment and/or stimulate economic activity, while in a rural location it may be more closely linked to environmental concerns, such as biodiversity.

## Types of green infrastructure

- Parks and public gardens
- Moorland
- General amenity space
- Agricultural land
- Outdoor sports facilities (incorporating hard surfaces and school playing fields)
- Allotments, community gardens and urban farms
- Woodland
- Cemeteries, churchyards and burial grounds
- Water courses
- Derelict land
- Grassland and heathland
- Private gardens
- Coastal habitat



## The role of green infrastructure

*gi* plays an important role in achieving sustainable economic growth, creating attractive communities where people want to live, work and visit.

It also has the potential to contribute to the aims and objectives of a number of different national and regional strategies.

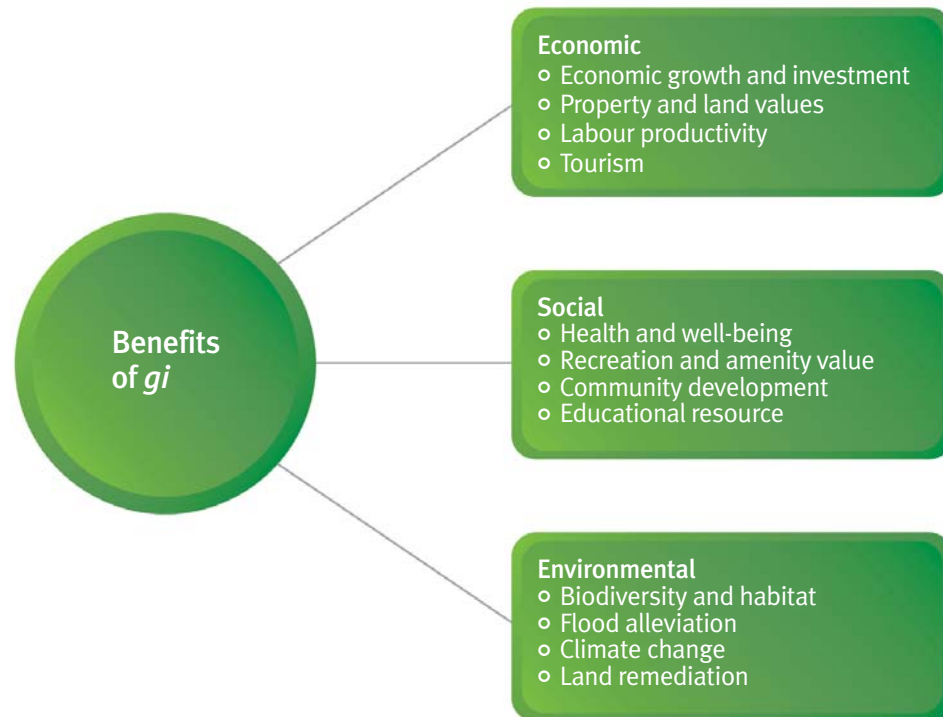


### *gi* functions

Functional category	Functional analyses
Environmental	<ul style="list-style-type: none"> <li>○ Flood amelioration</li> <li>○ Air quality amelioration</li> <li>○ Biodiversity</li> <li>○ Renewable energy</li> </ul>
Economic	<ul style="list-style-type: none"> <li>○ Food production</li> <li>○ Labour productivity (recreation benefits)</li> <li>○ Labour productivity (visual benefit)</li> <li>○ Image and investment</li> <li>○ Contribution to regeneration</li> <li>○ Contribution to tourism</li> </ul>
Social	<ul style="list-style-type: none"> <li>○ Recreation and amenity</li> <li>○ Access to accessible natural greenspace</li> <li>○ Health</li> <li>○ Education</li> <li>○ Cultural heritage</li> </ul>
Multi-functionality	<ul style="list-style-type: none"> <li>○ Potential multi-functionality derived from greenspace location and physical characteristics</li> <li>○ Potential for additional functions through physical intervention</li> </ul>

## Benefits of green infrastructure

There are numerous benefits associated with *gi*. These are summarised in the diagram below and explained in more detail over the next few pages.



## Economic benefits

Green spaces play an important role in stimulating economic growth and attracting inward investment. They can lead to higher property prices, improved labour productivity, increased tourism and visitor activity, each of which is discussed in turn below.

**Economic growth and investment**  
Investment in *gi* can draw in greater levels of investment and improve the economic performance of the local economy.

For example, the green development of Riverside Park Industrial Estate in Middlesbrough levered over £1 million of private sector investment, creating local employment opportunities and further scope for business growth.<sup>1</sup>

<sup>1</sup> CLES & Groundwork (2007) The Contribution of the Local Environment to the Local Economy



### Property and land values

There is a positive relationship between proximity to greenspace and property prices.

An uplift in property and land prices can be seen as an indication of the overall value local residents attach to being located close to *gi*. It is also a direct benefit in itself to property and landowners.



## Economic benefits continued

### Labour productivity

EMRA's Green Infrastructure Scoping Study discovered that: "greenspace can have indirect positive effects, not only on prospects for inward investment, but also on productivity of the labour force."

"Positive effects can come about through visual interaction evoking feelings of well-being and reducing stress".<sup>2</sup>

The suggestion that *gi* can assist in improving labour productivity is of particular importance for the development of commercial space, where occupiers would be likely to benefit from the inclusion of open spaces and public realm.

<sup>2</sup> East Midlands Regional Assembly (2006) Green Infrastructure – Phase One Scoping Study

### Tourism

The Park Life Report indicates that 82% of residents believed that high-quality green parks encourage people and businesses to locate to an area.<sup>3</sup>

Furthermore, EMRA's Green Infrastructure Scoping Study identifies that "local environmental quality, particularly relating to the physical environment, is critical to people's perception of an area as a place to work and live".

"It influences investment decisions, particularly in the knowledge-based and technology sectors". By attracting visitors and visitor spend, *gi* can contribute significantly to local economy, boosting jobs and supporting communities.

<sup>3</sup> Greenspace (2007) The Park Life Report



## Social benefits

The social value of *gi* relates primarily to its impact on people's quality of life. Overall, *gi* is seen as having the potential to generate health and educational improvements, enhance community development and provide a valuable resource for recreation and leisure. These benefits are explored further below.

**Health and wellbeing:** *gi* is associated with a number of health and wellbeing benefits, primarily focusing on access to areas in which people can engage in physical activity.

However, *gi* also offers other health and wellbeing benefits, including reduced incidence of respiratory illness, improved mental health and reduced stress.

*gi* and tree planting in particular, has also been identified as offering specific benefits in terms of improving local air quality. A study undertaken in the West Midlands suggests that doubling tree cover across the region could prevent 140 pollution-related premature deaths in the region each year.<sup>4</sup>

<sup>4</sup> Stewart Et Al (2003) Trees and Sustainable Urban Air Quality

### Recreation and amenity value

EMRA's Green Infrastructure Scoping Study states that "one of the most widely recognised functions of greenspace is to provide a setting for recreation and amenity".

Investment in *gi* can enhance access to accessible natural greenspace and provide opportunities for various forms of recreational activity. In addition, *gi* itself can be seen as a cultural asset that helps to give an area a distinct sense of identity.





## Social benefits continued

### Community development

*gi* can contribute to various aspects of community development. The development and enhancement of *gi* can improve civic pride and place vitality.

It can also provide opportunities for social interaction, helping to increase community cohesion and social inclusion. Investment in *gi* can also help to improve community safety.

### Educational resource

*gi* offers a range of both educational opportunities to all age groups, such as the use of greenspaces for organised activities, the richness and experience offered by the existence of parks in urban areas and educational benefits associated with the greening of school grounds.

Areas with trees and grass offer better play opportunities for children and lead to significantly higher levels of creative play, whilst young children playing in natural environments have been found to have more advanced coordination and balance than children constrained to a traditional playground.



## Environmental benefits

The development of *gi* can lead to a number of environmental benefits, such as the provision of new wildlife habitat, helping to enhance biodiversity, along with flood alleviation and water management.

It can also play an important role in climate change mitigation and adaptation as well as in land remediation. Each of these benefits is discussed below.

### Biodiversity and habitat

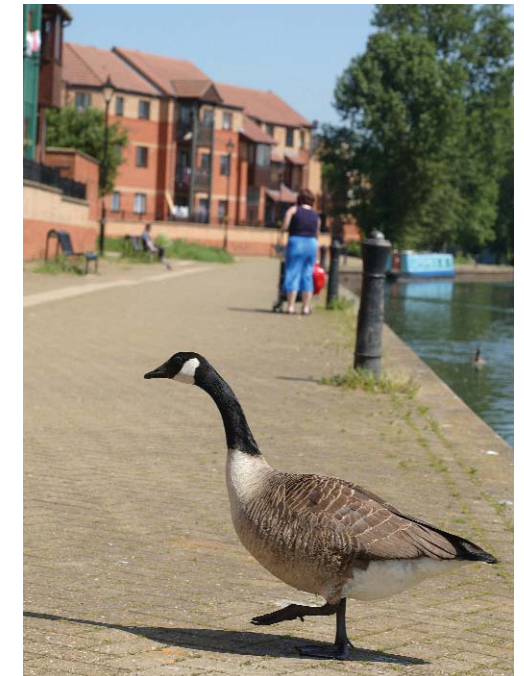
**Greenspaces provide habitat for a wide variety of species. Investment in *gi* is a key component of reversing habitat fragmentation and increasing biodiversity to restore functioning ecosystems.**

Furthermore, in supporting ecosystems, a wider range of species will inhabit urban areas with consequential benefits for local communities in terms of providing access to natural green spaces.

### Flood alleviation and water management

In light of recent floods experienced in the UK, as well as the climate change agenda, the economic impact of flooding is now a central concern of social, environmental and economic policy.

Open space within river valleys have an economic role in flood alleviation. Retention of flood plains as greenspace can reduce requirements for engineered flood defence further down river and as such constitute a significant economic saving.



## Environmental benefits continued

### Climate change mitigation and adaptation

Effectively implemented *gi* can provide a significant carbon sink.

For instance, plants and trees absorb greenhouse gases, including carbon dioxide from the local atmosphere. *gi* can also lower temperatures locally, reduce energy consumption and reduce humidity and temperature within urban locations. The sheltering impact of a belt of urban woodland can also cut energy costs by 10%.

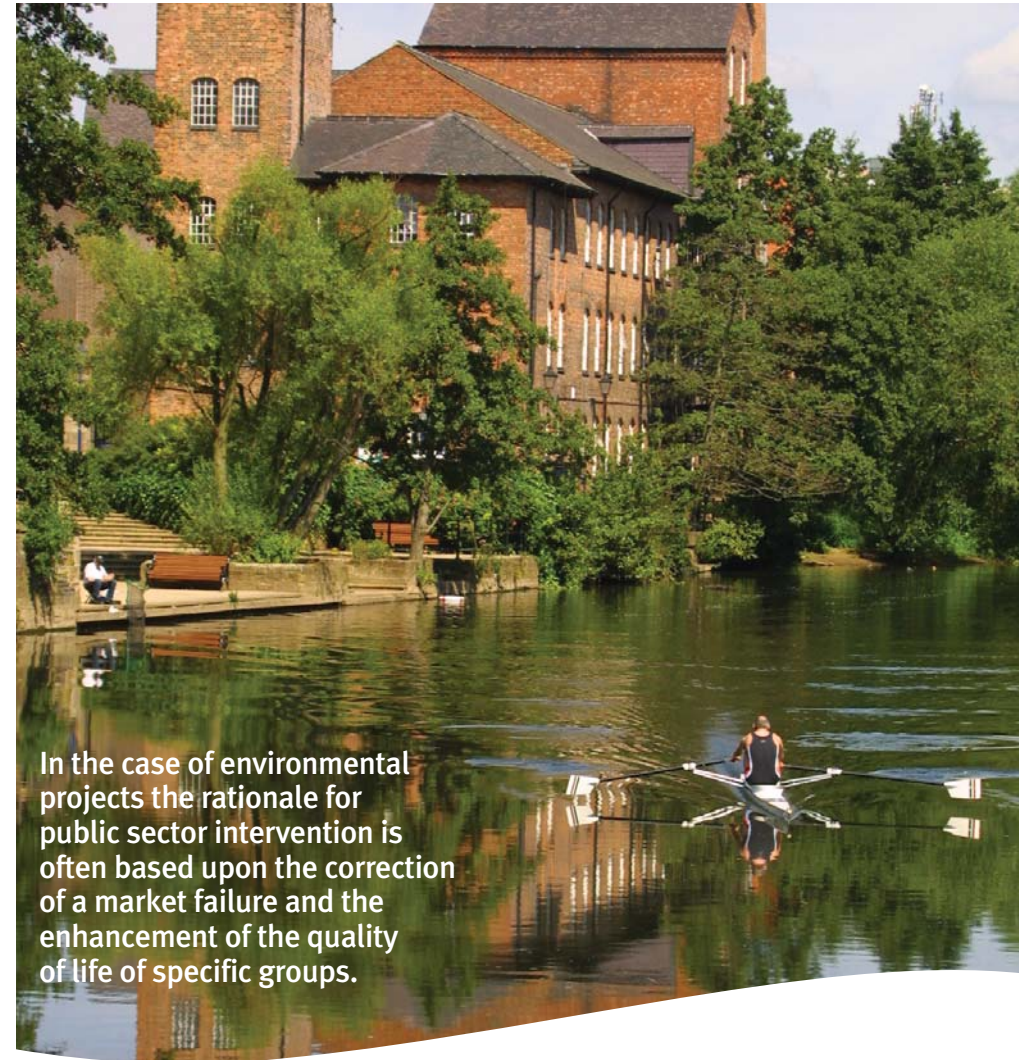
### Land remediation

The urban renewal agenda has focussed development within town and city centres, prioritising the redevelopment of brownfield sites.

Whilst there remains an extensive brownfield resource within the East Midlands region, a significant proportion of these sites suffer from contamination resulting from a legacy of industrial use, waste disposal and mineral extraction. Evidence suggests that conversion of contaminated land to *gi*, and particularly tree planting, represents an effective land remediation strategy.



## Rationale for intervention



In the case of environmental projects the rationale for public sector intervention is often based upon the correction of a market failure and the enhancement of the quality of life of specific groups.

## Beneficiaries of green infrastructure

The following sets out the main beneficiaries from investment in *gi* and the value they can obtain through the development and enhancement of green spaces.

### Beneficiary

#### Local community

#### Value

- Better quality of life and improved mental health
- Greater social inclusivity and a more accessible environment
- Higher levels of civic pride
- Increased property prices
- Reduced pollution
- Better security and less crime
- Improved access to amenity greenspace for leisure activities

### Beneficiary

#### Local business

#### Value

- Image quality attributable to *gi* offers prestige to local businesses
- Greater numbers to participate in leisure and recreation activities, with potential economic benefits for adjacent businesses
- Improved staff retention and recruitment of skilled employees

### Beneficiary

#### User groups

#### Value

- Improved access to quality greenspaces for leisure and recreation groups
- Health benefits to users from improved access to cycling and walking opportunities
- Increased amenity value from the provision of higher quality, attractive green spaces

### Beneficiary

#### Local authority

#### Value

- Improved area image and increased regenerative potential
- Potential to reduce public expenditure on crime prevention, management of urban spaces and health issues associated with inactivity
- Increased economic viability of adjacent sites
- Increased local tax revenue due to higher property values

### Beneficiary

#### Investors and developers

#### Value

- Increased likelihood of a return, offering lower risk and greater security
- The asset, once developed, has greater value in locations adjacent to green spaces, enabling the stakeholder to borrow more on the value of the asset
- Reduced heating and air conditioning costs in some instances due to the sheltering effects of vegetation
- Improved development image and higher quality of tenants



A scenic view of a canal. In the background, a modern, curved building with a glass facade is visible. The canal is lined with lush green trees, including a large weeping willow. In the foreground, a boat with a yellow cabin is docked on the right bank. The water reflects the surrounding greenery and the building.

## Evaluation framework – for existing projects

The next section sets out an evaluation framework which can be used to assess the economic, social and environmental impacts of existing *gi* projects.

## Approach to evaluation – an overview

### Evaluation is the critical examination of projects and programmes in order to assess the extent to which:

- The objectives of intervening have been achieved.
- Additional impacts or changes that are attributable to the project or programme have resulted.
- These changes were secured in a sustainable, efficient way and were value for money.
- And to provide lessons for the future.

Any approach to evaluation must ensure that a range of key evaluation questions are answered and that a robust and comprehensive research method is implemented.

As outlined in the diagram below, the proposed framework comprises the use of various research methods, including baseline analysis and benchmarking. A number of integrated evaluation analyses are also encompassed within the framework so that the full impact of the *gi* programme can be assessed.

### Framework for evaluation

Research methods	Evaluation analyses	Reporting
<ul style="list-style-type: none"> <li>◦ Project review</li> <li>◦ Output monitoring</li> <li>◦ Financial performance</li> <li>◦ Socio economic or market</li> <li>◦ Policy or strategy review</li> <li>◦ Stakeholder interviews</li> <li>◦ Beneficiary surveys</li> <li>◦ Benchmarking</li> <li>◦ Case studies</li> </ul>	<ul style="list-style-type: none"> <li>◦ Logic chains</li> <li>◦ Relevance</li> <li>◦ Outputs, outcomes and impacts</li> <li>◦ Gross to net additionality</li> <li>◦ Strategic added value</li> <li>◦ Distributional analyses</li> <li>◦ Value for money</li> <li>◦ Comparison with appraisal</li> <li>◦ Sustainability</li> <li>◦ Lessons learned</li> </ul>	<ul style="list-style-type: none"> <li>◦ Evaluation framework/ inception report</li> <li>◦ Interim report</li> <li>◦ Final report</li> </ul>

## Research methods

### A range of research methods should be applied in order to derive a robust evidence base. The following briefly summarises the research methods to be applied:

- **Review of key project documentation (including applications and appraisals)** to assess the rationale for the project and gain familiarity with the objectives and intended activities.
- **Analysis of output and monitoring data** to assess performance compared with forecast activity and measure the gross impact of the project.
- **Analysis of financial performance** to assess the level of gross expenditure by source, receipts and net expenditure by source in terms of both forecast and actual.
- **Analysis of baseline and secondary trend data** to assess the local environmental conditions and contextual socio-economic and property market data relating to the region and target areas and how these have changed.
- **Contextual policy/strategy review** to assess the relevance of activities (and their policy impact).
- **Key stakeholder consultations** to assess the views of key stakeholders. The range of 'stakeholder' consultees could include relevant local authorities, *emda*, the Homes and Communities Agency, environmental or wildlife groups, developers and other partners such as local residents groups and community organisations.

- **Beneficiary surveys** to assess the impact on beneficiaries. These could encompass developers, landowners, local businesses and local communities in areas in which the agency has been active. Techniques used could include postal and telephone questionnaires, face-to-face interviews and focus groups or workshops.
- **Benchmarking against similar project activities** to assess the relative impact and value for money of the project and identify elements of best practice. This may include reviewing evaluations of similar activities carried out by other organisations.
- **Case studies** to assess the appropriateness and relative effectiveness in various circumstances of different types of intervention, exemplifying the potential impact of each identified *gi* category.

The above research methods should be applied to gather quantitative and qualitative evidence that can be used to assist in answering the key evaluation questions posed in the proceeding section. In doing so, it will be useful to examine the specific types of *gi* intervention and their specific impacts.

This can help to overcome methodological difficulties that can be caused by the varying timescales and stage of development of the interventions under review.

## Evaluation analyses

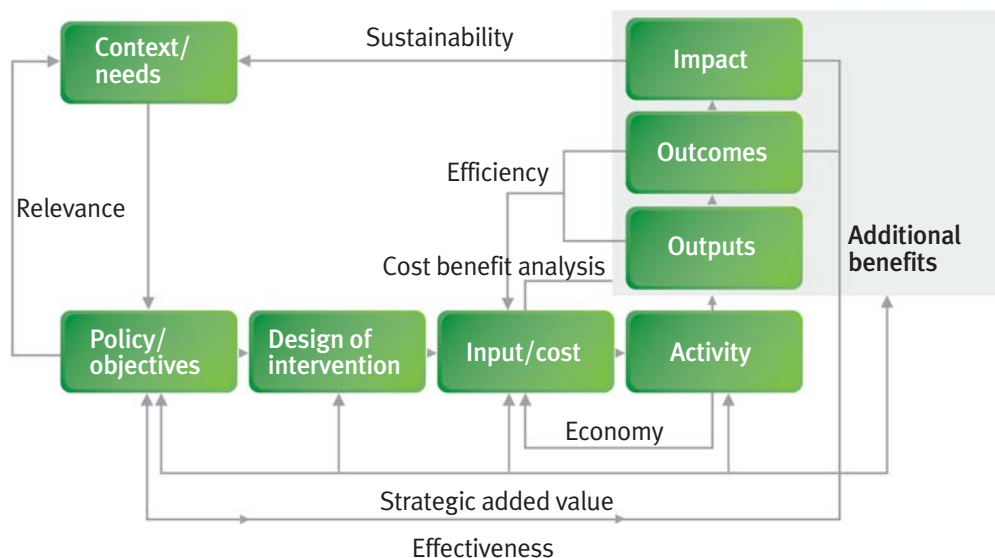
### Within any evaluation exercise a number of key issues will need to be addressed and analysed.

For example, the effects of a project can be wide ranging and the rationale and justification for support will vary depending upon the type of activity under consideration.

Figure 4.3 sets out an overview of the principal issues that will need to be assessed in relation to investment in *gi* and the linkages between the different components of the proposed evaluation framework.

In order to take account of these various issues a range of integrated evaluation analyses should be undertaken. Each of these is summarised in turn below together with examples of some of the key questions that will need to be answered.

Figure 4.3: Overview of key evaluation issues



## Logic chains

### These are an essential element of the approach to assessing projects and programmes.

In particular, the development of logic chains can serve as a useful framework for assessing:

- The connections between inputs, activities, outputs, outcomes and impacts
- The rationale for the intervention(s) by consideration of its or their context
- The intervention's design

Detailed logic chains should be developed as part of the evaluation. An exemplar logic chain has been produced for the three main impact areas associated with *gi* (economic, social and environmental) as shown within Table 4.2. This draws out the general issues related to *gi* activities. (Please see next page for Table 4.2)

### An outline logic chain

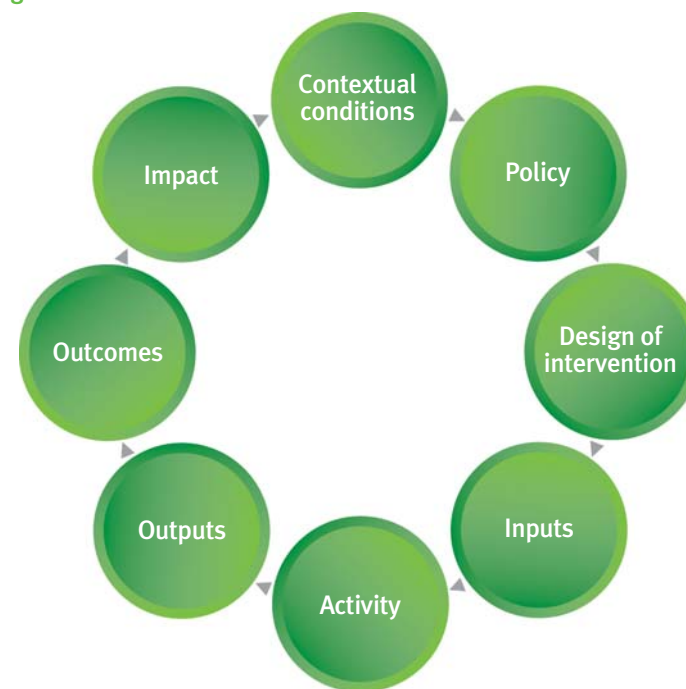


Table 4.2: Generic logic chain – *gi*

Policy area	Economic	Social	Environmental
Contextual conditions	<ul style="list-style-type: none"> <li>Contaminated land and waterways</li> <li>Poor quality public realm</li> <li>Lack of open space</li> </ul>		
Policy context	<ul style="list-style-type: none"> <li>Regional Economic Strategy</li> <li>Regional Spatial Strategy</li> <li>Local planning policies</li> </ul>		
Design of intervention – objectives and targets	<ul style="list-style-type: none"> <li>Intervention design to address market failure or equity issues</li> <li>Master planning or growth area assessment</li> <li>Specific economic, social and environmental objectives, including potentially: <ul style="list-style-type: none"> <li>Improving productivity and growing the market</li> <li>Promoting conditions for sustainable growth</li> <li>Increased biodiversity</li> <li>Enhanced activity and health benefits</li> <li>GVA growth</li> <li>Job creation</li> <li>Firm formation</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Qualifications</li> <li>Employment rate</li> <li>Deprivation</li> </ul>	<ul style="list-style-type: none"> <li>CO<sup>2</sup> emissions</li> <li>Waste production</li> <li>Recycling rates</li> </ul>
Inputs	<ul style="list-style-type: none"> <li>Land resources – public and private assets</li> <li>Human resources – public and private skills and time</li> <li>Financial resources – public and private capital and revenue</li> <li>International resources – ideas and endeavour</li> </ul>		
Activities	<ul style="list-style-type: none"> <li>Realise economic potential of <i>gi</i></li> <li>Enterprise development</li> <li>Regional competitiveness</li> <li>Sustainable production</li> <li>Mixed-use development</li> </ul>	<ul style="list-style-type: none"> <li>Health and well-being</li> <li>Responses to population change</li> <li>Culture and image</li> <li>Community cohesion</li> <li>Skills, qualifications and education</li> </ul>	<ul style="list-style-type: none"> <li>Better use of natural environment</li> <li>New use for brownfield land</li> <li>Sustainable agriculture</li> <li>Sustainable energy strategy</li> <li>Protection of the countryside</li> <li>Place making</li> </ul>
Outputs	<ul style="list-style-type: none"> <li>Jobs created and jobs in priority sectors</li> <li>Increase in visitor numbers</li> <li>Businesses assisted</li> </ul>	<ul style="list-style-type: none"> <li>Increased physical activity rates</li> <li>Increase in educational attainment</li> <li>Increase in community usage</li> </ul>	<ul style="list-style-type: none"> <li>Brownfield land reclaimed/ developed</li> <li>Public realm developed/enhanced</li> <li>Biodiversity/habitat protected</li> </ul>
Outcomes	<ul style="list-style-type: none"> <li>Enhanced GVA growth</li> <li>Increased employment rates</li> <li>Improved business performance</li> </ul>	<ul style="list-style-type: none"> <li>Increased health and well-being</li> <li>Reduction in deprivation levels</li> <li>Increased community cohesion</li> </ul>	<ul style="list-style-type: none"> <li>Reduced CO<sup>2</sup> emissions</li> <li>Increased access to environment</li> <li>Reduction in insurance premiums</li> </ul>
Impacts	<p>A dynamic, sustainable, international, economy consistent with:</p> <ul style="list-style-type: none"> <li>Increased GVA per capita</li> <li>Sustainable consumption and production</li> <li>Climate change and energy</li> <li>National resource protection and environmental enhancement</li> <li>Sustainable communities</li> </ul>		

## Logic Chains

The construction of Logic Chains should form part of the integrated assessment of outputs, outcomes and impacts and value for money, as well as other key evaluation analyses.

Key evaluation questions that will need to be answered in terms of the development of logic chains are:

- To what extent have the activities implemented as part of the *gi* project or programme led to the outputs, outcomes and impacts?
- How has the project or programme addressed the recognised rationale for intervention, including any identified market failures and/or equity considerations?
- To what extent did the project's or programme's design contribute to the achievement of the desired outcomes?

## Relevance

The evaluation will need to review the extent to which the underlying rationale for *gi* projects and programmes, was, and still is relevant and the extent to which changes have, or need to be made, in light of any changing context.

Key evaluation questions that will need to be answered in terms of relevance are:

- To what extent are the objectives of the project or program consistent with the identified regional priorities (RES/RSS)?
- To what extent are the activities of the project or programme justified in relation to the needs of the region or target area?
- To what extent are the outputs, outcomes and impacts of the project or programme relevant to the stated objectives?

**Outputs, outcomes and impacts** *gi* has the potential to result in a diverse range of outputs, outcomes and impacts. Firstly, the various outputs, outcomes and impacts generated by the project or programme should be identified and assessed.

Secondly, a monetary value should be calculated for each of the impacts created by the project/programme where this is feasible.

Lastly, a score should be attached to each impact in order to provide an overall assessment of the effect of investment in *gi*.

Key evaluation questions that will need to be answered in terms of outputs, outcomes and impacts are:

- To what extent has the project or programme achieved its expected outputs?
- To what extent have those outputs led to the anticipated outcomes and impacts of the project or programme being achieved?
- What value, in monetary terms, can be attributed towards the impacts of the project or programme?
- How has the project or programme performed with regard to the full spectrum of potential economic, social and environmental impacts?

## Gross to net additionality

Additionality relates to the net changes that are brought about by a project or programme over and above what would have taken place anyway. The HM Treasury Green Book defines this as “an impact arising from an intervention is additional if it would not have occurred in the absence of the intervention.”<sup>5</sup>

Key evaluation questions that will need to be answered in terms of additionality are:

- What level of outputs and outcomes would have happened anyway without the project or programme?
- Did the project or programme benefit individuals outside of the target area or group? If yes, by how much?
- Did the project or programme reduce existing activity within the target area or group? If yes, where and by how much?
- How many additional outputs have occurred through purchases along the supply chain and employee spending?

<sup>5</sup> HM Treasury (2003) The Green Book



### Strategic added value

This involves consideration of the nature and scope of strategic added value (SAV) achieved by the project or programme and how this has contributed to the achievement of wider policy objectives.

SAV can be achieved in a number of ways – through, for example, provision of strategic direction, exertion of influence, the provision of intelligence and engagement activities.

Key evaluation questions that will need to be answered in terms of strategic added value are:

- How effectively has the project or programme influenced the activities of other partners?
- Is the project or programme adding value or filling gaps in activities?
- To what extent have other agencies changed their practices to accommodate *gi* objectives?

### Distributional analysis

A key evaluation issue concerns the distribution of benefits that have been generated by *gi* projects. The extent to which factors such as resource allocations, partnership working arrangements and the design, delivery, targeting and marketing of services are contributing to the achievement of equity objectives will be an important component of the evaluation.

Key evaluation questions that will need to be answered in terms of distributional analysis are:

- To what extent has the project or programme contributed to the achievement of equity objectives?
- Are the needs of marginalised communities being addressed by the project or programme?
- Are existing environmental ‘problem areas’ being addressed by the project or programme?

### Value for money (VFM)

VFM is defined as being “determined by the relationship between total costs (the resources a project uses up) and total benefits (including, in particular, the outputs and outcomes it is anticipated to achieve)... for a project to offer VFM its benefits must exceed its costs”.<sup>6</sup>

Key evaluation questions that will need to be answered in terms of value for money are:

- Do the total benefits of the project or programme exceed the total costs?
- Are the costs the minimum necessary given the nature and quality of the project or programme?
- Are the aims and objectives of the project or programme being achieved?
- Are the ratios of public sector costs to outputs reasonable compared with benchmarks?

<sup>6</sup>OFFPAT (2008) VFM Project Advice Note



### Reappraisal of the business case

The actual results of the project or programme need to be compared with the expected outturns at appraisal. This will involve a comparison of actual and anticipated costs, benefits, value for money and programme. In addition, an assessment should be undertaken of the risk that did or did not materialise.

Key evaluation questions that will need to be answered in terms of reappraisal of the business case are:

- How did actual costs compare with those expected at appraisal? What were the reasons for any variation? How did actual outputs, outcomes and impacts compare with those expected at appraisal? What were the reasons for any variation?
- How did actual value for money compare with that expected at appraisal? What were the reasons for any variation?
- What risks did and did not materialise?

### Sustainability

It will be important to assess the extent to which an individual project or overall *gi* programme has made a lasting change in conditions and, more generally, whether they have resulted in sustainable development.

Key evaluation questions that will need to be answered in terms of sustainability are:

- Are the improvements achieved by the project or programme likely to be sustainable in the short and the longer term?
- Will the project or programme become financially self-sustaining?
- Is the project or programme addressing the underlying causes of the problems it is seeking to address and the objectives set out in the application?

### Lessons learned

A critical component of any evaluation is to identify the lessons learned and to ensure that these are fed back into the decision-making process. Consequently, careful consideration will need to be given to what the results mean for future management and policy decisions and to ensuring that these issues are widely disseminated.

Key evaluation questions that will need to be answered in terms of lessons learned are:

- To what extent have new effective approaches been developed through the implementation of the project or programme?
- To what extent have best practice lessons been identified and transferred following the implementation of the project or programme?
- What were the main lessons learned?



## Reporting arrangements

The reporting arrangements for the evaluation of *gi* projects and programmes should comprise three main stages.

**1. An initial inception report should first be produced, in line with the evaluation framework described above and should include the following information:**

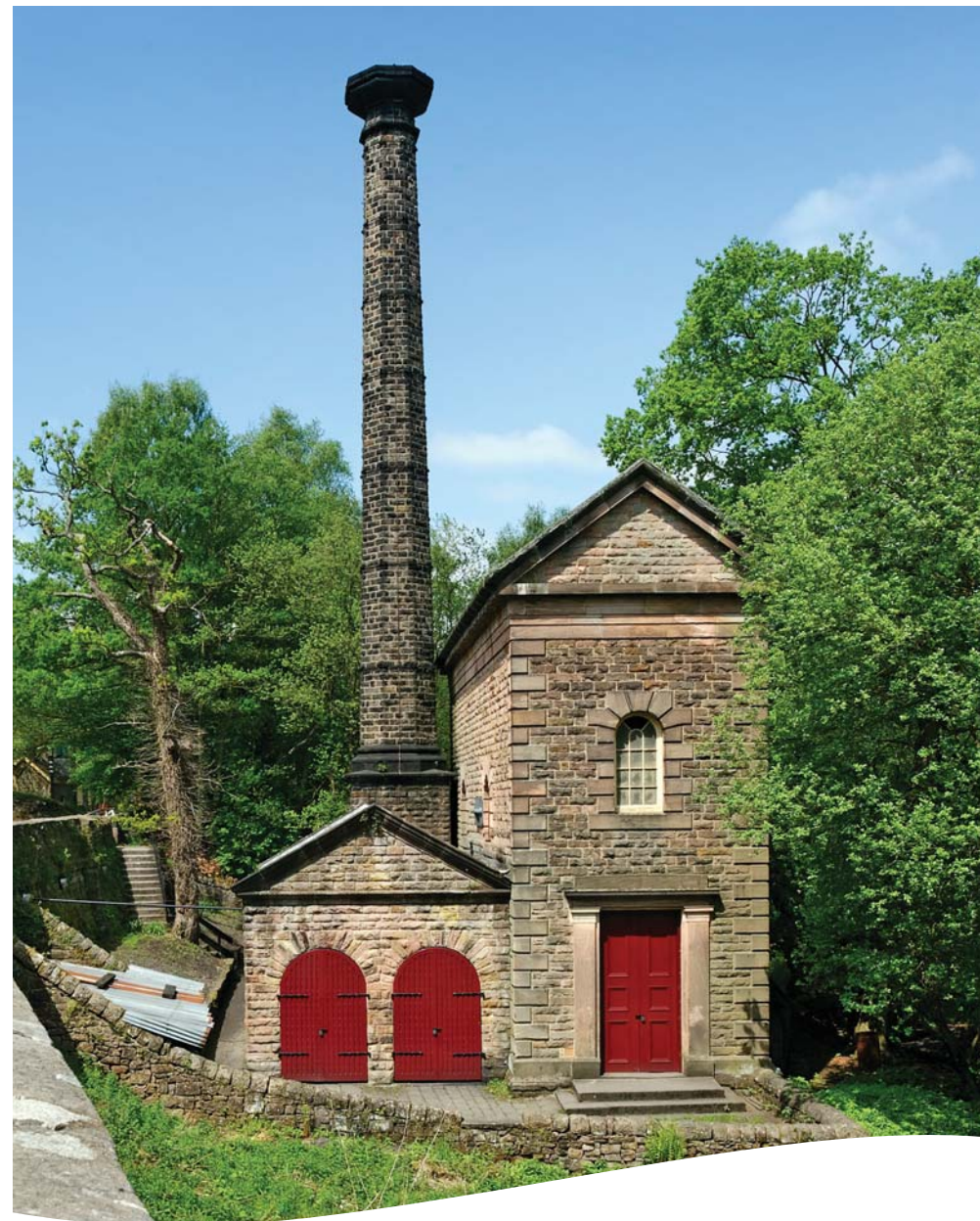
- Project name
- Description and key activities (including progress to date)
- Aims and objectives
- Rationale for Agency investment
- Target geographical area or beneficiaries
- Key milestones or timetable
- Costs, income and funding
- Gross expenditure by source
- Receipts
- Net expenditure by source
- Project outputs, outcomes and impacts
- Key risk factors and mitigation
- Further comments

**2. For projects that have not yet delivered significant outputs, an interim evaluation report should be produced.**

This is likely to be after the second or third year of a project or programme and should focus on process issues and administrative efficiency, but also include an analysis of individual project performance and the aggregate effects of the programme as a whole. It should also consider the expected outputs and outcomes.

**3. At the end of a project or programmes lifetime a final evaluation report should be produced.**

This should include an analysis of the full costs, benefits and value for money of each project or programme, as well as the role of the Agency in achieving any improvements and the key lessons that have been learnt.



## Assessment framework for future projects

The next section sets out an assessment framework which can be used to identify and assess the potential of future *gi* projects.

## Assessing the impact of green infrastructure projects

As the benefits of *gi* are potentially wide ranging and include a number of effects that are difficult to quantify, calculating the overall potential impact of a *gi* project can be a complex process.

Therefore it is recommended that *gi* projects at concept stage are first assessed on the basis of the checklist outlined in the table opposite.



### Initial Assessment Checklist

Impact criteria	Assessment of impact	Comments
<b>Economic value</b>		
Economic growth and investment		
Property and land values		
Labour productivity		
Tourism		
<b>Social value</b>		
Health and well-being		
Recreational and amenity value		
Community development		
Educational resource		
<b>Environmental value</b>		
Biodiversity and habitat		
Flood alleviation and water management		
Climate change mitigation		
Land restoration		
– = negative impact + = positive impact o = neutral impact ? = gaps in evidence		

Then, the next step would be assessment using the full assessment checklist (set out below) as well as providing additional information in relation to, for instance, the project context, aims and objectives, costs and funding and potential key risks.

Full assessment checklist	
Project name	Name of the project for which support is requested.
Site location	<p>Location of the project for which support is requested (a location plan should be provided).</p> <p>This should include the local authority area and ward in which the site is situated.</p> <p>Information on current site conditions and ownership/ occupation of the site should also be provided.</p>
Project description	<p>Detailed description of the project, including:</p> <ul style="list-style-type: none"> <li>○ type of <i>gi</i> project proposed</li> <li>○ site area</li> <li>○ specification of intended works</li> <li>○ site plan and artist impression, where possible</li> <li>○ standards and principles adopted</li> </ul> <p>In addition, details should be provided on the proposed delivery arrangements.</p> <p>Information should also be included regarding the various options that have been considered and why the chosen project was preferred.</p>
Timetable	<p>Timetable for the project, including phasing of development, start date and completion date.</p> <p>The timings of any required approvals or agreements should also be indicated.</p>
Context	<p>Summary of the context to the project, drawing out the rationale (need) for intervening.</p> <p>This should provide details regarding the following:</p> <ul style="list-style-type: none"> <li>○ environmental context – for example, poor quality public realm, lack of open space;</li> <li>○ socio-economic context – for example, low levels of economic activity, poor health;</li> <li>○ strategic context – for example, fit with the RES, local authority priorities.</li> </ul>
Aims and objectives	Aims and objectives of the project, setting out what it is trying to achieve and why.

Costs and funding	<p>Costs incurred by the project, broken down by year and funding source.</p> <p>Both capital and revenue costs should be shown, as well as any income or receipts that are expected to be achieved.</p> <p>The breakdown of funding should identify separately costs public sector sources and the private sector.</p> <p>Details of any application for alternative or additional public sector finance should also be included.</p> <p>The sources of private sector funding should be indicated, where relevant, with supporting evidence showing terms.</p>
Project benefits	<p>Assessment of the benefits expected to be achieved by the project, including any:</p> <ul style="list-style-type: none"> <li>○ economic impacts</li> <li>○ social impacts</li> <li>○ environmental impacts</li> </ul> <p>This should initially involve a qualitative assessment in the form of a checklist analysis.</p> <p>As the project becomes more developed, detailed analysis of the expected benefits will need to be undertaken, with each of the impacts quantified in monetary terms, where possible, and attributed a score.</p> <p>In determining the likely impacts of the project, consideration should be given to the type of <i>gi</i> under consideration.</p> <p>Different types of <i>gi</i> are likely to generate differing benefits.</p>
Potential risk	<p>Key risks to the project and future issues that could arise.</p> <p>An assessment should be presented of the likelihood and impact associated with each of the key risks.</p> <p>Brief details should also be provided in terms of how these risks will be managed or mitigated.</p>
Monitoring and evaluation	Proposed arrangements for monitoring and evaluating the impact of the project.

## Identifying investment priorities

**An additional component to assessing the impact of potential future *gi* projects will need to involve identifying where organisations should prioritise their investment.**

Projects will, therefore, need to be assessed in terms of the form of benefits that they are expected to generate.

Once short-listed projects have been fully assessed, using the previous framework, investment decisions can be made on the basis of the outputs, outcomes and impacts, monetary values and scores attributed to each impact criterion.



## Conclusion

***gi* has significant potential economic value, as well as bringing a host of other social and environmental benefits to an area. These benefits include:**

- An increase of up to 34% in property values can be obtained for properties facing a park.<sup>7</sup> *gi* can also increase the occupancy levels of a development.
- Research in the south west found that 35% of relocating companies quoted environmental attractiveness as a key reason for the move. In the West Midlands, 33% of investors in the region considered the attractiveness of the region to be an important factor in location decisions.<sup>8</sup>
- There is also evidence that *gi* can help to increase labour productivity.
- High-quality *gi* can help to attract visitors and boost the tourism sector.
- *gi* can also result in improved health and well being; recreational and amenity value, community development and educational benefits.
- Investment in *gi* can result in increased biodiversity and habitat, flood alleviation and water management, climate change mitigation, and land remediation.
- A range of different stakeholders can benefit from *gi* including investors, developers, occupiers, public sector bodies and the wider community.
- Appropriate long-term maintenance arrangements and funding need to be established if the benefits are to be long lasting.

<sup>7</sup> Cabe Space (2005) Does Money Grow on Trees?

<sup>8</sup> AWM and The Environment Agency (2001) The Environmental Economy of the West Midlands



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