



CIRIA proposal 2904

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Demonstrating the multiple benefits of SuDS – a business case

Phase 2 – Developing a detailed methodology and presenting evidence

Summary

It is becoming recognised that the traditional approach to managing surface water is no longer sustainable and that Sustainable Drainage Systems (SuDS) is necessary to improve the way flood risk and water quality is managed while also delivering multiple benefits. This project will support SuDS delivery, particularly retrofitting by developing and collating an evidence base, case studies, guidance and agreed methodology to better understand costs and value the broad range of benefits providing a more compelling business case.

Background

SuDS provide opportunities to improve water quality and reduce the flood risk associated with surface water runoff. It also enables improvements in biodiversity, urban design, amenity, place making and other factors influencing local quality of life and spaces. With the growing requirement to explore different funding routes, particularly joint funding and partnerships for flood risk management it is becoming increasingly important that this appraisal should be sophisticated enough to cover multiple benefits and as many beneficiaries as possible associated with surface water management measures, particularly Sustainable Drainage Systems (SuDS).

Growing evidence from the UK and overseas suggests that well designed sustainable drainage for new developments are cheaper and more beneficial than traditional approaches for those funding projects and the wider society. However, there is a more that can be done to obtain further information and there's limited consensus on approaches and evidence, it is even less certain for retrofitting. CIRIA's guidance on retrofitting to manage surface water together with other policies and strategies (Localism Act, the National Flood & Coastal Erosion Strategy, catchment management etc) highlight the importance of partnerships and capturing the full range of benefits associated with SuDS, green infrastructure and ecosystem services to identify beneficiaries and partnership funding in achieving desired outcomes.

Following the Millennium Ecosystem Assessment in 2005 there has been a number of relevant initiatives related to assessing ecosystem services and valuing green infrastructure interventions in our cities, towns and villages. Methodologies to assess the full (monetary) value of economic (i.e. including social and environmental) benefits are continually evolving. Approaches like these place a monetary value on the benefits from interventions to assist decision making.

Phase 1 of this project, run by the Environment Agency with support from Halcrow and partners has focused on identifying and locating a range of retrofit SuDS components and schemes to obtain cost information, develop an evidence base and demonstrate good practice. Information on the dimensions, costs and other factors required for an assessment of benefits and costs will be collated and eventually used to determine the costs and multiple benefits of SuDS once an agreed methodology has been developed. This information will be captured and collated electronically then disseminated to enable future analysis of the full range of costs and benefits by a wide range of stakeholders.

Justification

With growing recognition that traditional approach to surface water management no longer being sustainable it is increasingly desirable to deliver SuDS, particularly in existing urban environments.

Reflecting the current economic climate and the need for value, and sustainable growth improvements in economic appraisal of infrastructure interventions are required. Approaches to appraisal that enable judgements as to the “value for money” of a given infrastructure project and facilitate prioritisation and partnerships are increasingly required. This is also likely to be reinforced by an evolving Ofwat/EA framework for developing drainage strategies that recognise the value of all benefits.

While supporting information and examples of SuDS delivery are growing there is still a shortage of specific evidence and methodologies around capturing the full range of benefits of SuDS (both proprietary products and landscaped approaches), particularly for retrofitting. Overcoming this challenge has been recognised by the industry and regulators as being crucial in retrofitting sustainable drainage. Some of the benefits this project will assess include:

- Flood risk management benefits
- Water quality and reduced treatment requirements
- Provision of biodiversity
- Amenity and recreation
- Climate change mitigation
- CO₂ reduction and reduced energy use
- Climate change adaptation (eg managing the Urban Heat Island Effect)
- Quality of life (health and wellbeing)
- Investment, labour productivity and property prices
- Community benefits
- Deferred capital expenditure

The list is not meant to be comprehensive at this stage.

Approaches to capture multiple benefits have begun to be explored for fluvial and coastal flood risk management. Official guidance like the FCERM-Appraisal Guidance (EA, 2010), Defra (An Introductory Guide to Valuing Ecosystem Services, 2007) and the Green Book (HM Treasury, 2003) allows and encourages the valuation of the natural environment and the services provided by ecosystems (eg Mayes Brook Park). This approach (and others like Social Return on Investment) to valuing the full range of benefits is going to be vital in supporting the shift towards partnership funding from government and the emphasis on delivering outcomes from environmental and economic regulators.

In addition, improved understanding of benefits delivered by ecosystem goods and services of SuDS could help generate is needed to implement payments for ecosystem services (PES) schemes. There has been a great deal of work in this area recently (e.g. Defra, Payments for Ecosystem Services 2010) as PES schemes offer an opportunity to generate income and fund schemes that deliver multiple benefits.

Benefits

A diverse group of stakeholders will benefit from the project. The key target audience and beneficiaries are likely to be those managing or living with local flooding and water quality challenges and those delivering redevelopment or regeneration projects and green infrastructure (ie regulators, local authorities, sewerage undertakers, clients and increasingly community and third sector organisations).

Opportunities will be taken to rationalise the presentation of benefits to avoid double counting and facilitate ease of use. Linkages and synergies with existing processes in similar fields will be explored to exploit earlier research and maintain consistencies (where appropriate).

Many of the beneficiaries are aware of the opportunities and challenges when retrofitting SuDS and have requested support in terms of integrating it with other business drivers, investment plans and appraisal mechanisms. The expected benefits of this project are to:

- Develop a compelling evidence base (including costs and benefits) and business case on the delivery of SuDS, particularly retrofit SuDS components and schemes.
- Support collaboration, sharing of experiences and knowledge on the benefits and costs of SuDS, promoting cost effective and practical delivery and retrofitting. Providing and promoting more momentum in retrofitting SuDS.
- Help and encourage engineers, planners, landscape architects and green infrastructure practitioners manage drainage systems and the built environment.
- Provide a valuation framework that facilitates partnerships and multi/partner funded SuDS schemes. This will support the development of business cases and applications for a variety of funding routes, including partnership funding, catchment restoration fund, Community Infrastructure Levy etc.
- Capture and widely disseminate good practice and examples of SuDS that deliver multiple benefits.
- Augment knowledge and experiences on delivering SuDS at a key stage in the process.
- Identify synergies and opportunities to improve the transparency and consistency of the appraisal process undertaken by those involved in managing surface water.
- Develop greater consensus on inclusion of SuDS in investment plans for relevant stakeholders.
- Contribute to wide range of government and regulator policy initiatives and commitments including:
 - Water White Paper – Water for life
 - Natural Environment White Paper – The natural choice – securing the value of nature
 - The second round of River Basin Management Plans under the EU Water Framework Directive
 - National flood risk management strategies in the UK
 - National initiatives to manage water quality (including the Water Framework Directive and imminent consultation on diffuse pollution strategy)
 - General approach to managing local flood risk and surface water management (including Partnership Funding)
 - Approaches to facilitate climate change adaptation
 - Localism and local decision making
 - Improving communities and facilitating Business Improvement Districts
 - Initiatives to encourage public private partnerships
 - Green infrastructure delivery

Aims and objectives

To expedite project delivery and capitalise on available funds the project has been split into two stages, stage 2a covering the scoping and stage 2b the development of tools and guidance. The overall aim of this proposal is to collate and evaluate potential methodologies for assessing costs and benefits of SuDS, develop approaches accepted by relevant stakeholders and using the data from Phase 1 and other projects

develop an evidence base and detailed case studies that present an assessment of the costs and benefits. The specific objectives of the project are to:

1. Engage with the wide range of organisations with an interest in evaluating the benefits and costs associated with SuDS to understand their needs, desired outcomes and perceived benefits. *[Stage 2a and 2b]*
2. Develop an initial evidence base and collation of case studies with cost information *[Stage 2a]* (for use and further analysis in Stage 2b)
3. Understand the approaches used by relevant stakeholders to assess whole life costs and benefits for delivering and managing SuDS, particularly retrofit schemes (and relevant green infrastructure). This is likely to focus on local authorities, sewerage undertakers and developers (and other risk management authorities). *[Stage 2a]*
4. Collate and assess potential methodologies for assessing costs and benefits of delivering SuDS to develop an interim methodology and associated guidance. This will include a national and international review of approaches used for assessing ecosystem services, green infrastructure and urban drainage. Consideration will be given to the extent to which costs and benefits can be assessed in qualitative, quantitative and monetary terms. (This will include liaison with Natural England and organisations like the Center for Neighborhood Technology (in the USA), GI North West etc to build on their experiences). *[Stage 2a]*
5. Work with and support relevant stakeholders who have collated information from Phase 1 of the project (and other case studies) to populate the database, test and develop an interim assessment framework and methodology for assessing the full range of benefits and costs associated with SuDS delivery. This will build on the information from phase 1. *[Stage 2a and 2b]*
6. Develop guidance and associated tools that provide full transparency and opportunities for modification for the assessment of costs and benefits. (Following the testing process, guidance and tools will be developed, the spreadsheet tools may if appropriate be developed for two stages, covering coarser optioneering and more detailed assessment) *[Stage 2b]*
7. Develop a broad suite of case studies and an evidence base demonstrating the approach and results of the methodology. *[Stage 2b]*
8. Disseminate the guidance and findings from the project and encourage broader delivery of SuDS by having dissemination and practical workshops. CIRIA's existing projects and links with other initiatives and organisations will be fully utilised. *[Stage 2a, but mainly 2b]*
9. Provide support for the collation of further evidence and maintenance of the portal developed in Phase 1. *[Stage 2a, but mainly 2b]*

The final output of this project will include guidance and spreadsheet tools (delivered through the web portal with links to and from www.susdrain.org as necessary) on the assessment of benefits and costs for SuDS with a focus on retrofitting for use in business/investment planning for a variety of stakeholders. A suite of case studies will also be developed to demonstrate approaches, outcomes and lessons learned.

The outputs will be placed within the broader context of surface water management, green infrastructure, urban design and regeneration. These interactions are likely to be complex but increasingly beneficial and will be addressed in the guidance.

The guidance will produce a (consensus based) framework and a process for assessing the benefits and costs of SuDS delivery, looking at the roles of different stakeholders, their drivers and approaches to funding and delivery. The guidance will also be augmented by spreadsheet tools, worked examples and real-life case studies. The specific deliverables include:

1. Consultation workshop report *[Stage 2a]*

2. Collation of case studies where multiple benefits have been delivered through SuDS delivery [Stage 2a]
3. Scoping report and literature review capturing approaches to assess benefits and their application to the UK [Stage 2a]
4. Guidance document on how to assess the costs and benefits related to SuDS [Stage 2b]
5. Spreadsheet tools to assess the costs and benefits of SuDS (covering coarse optioneering and final more detailed appraisal) [Stage 2b]
6. Suite of case studies applying the developed approach for presentation on www.susdrain.org [Stage 2b]
7. Powerpoint presentation (with notes) providing summary of generic guidance [Stage 2b]
8. Summary webpages for www.susdrain.org [Stage 2b]

Project team

CIRIA

CIRIA will manage the collaboration, quality, objectivity, independence and relevance of the document to the industry and will co-ordinate the production of the proposed guidance outputs. CIRIA will also manage the consultation, engagement and dissemination throughout the project.

The overall project will be managed by one of CIRIA's experienced Project Managers, who will be guided by an independently chaired Project Steering Group.

CIRIA has a strong reputation for the production of collaborative and consensus based guidance on urban drainage, sustainable drainage and green infrastructure and also has extensive links with government, practitioners and the wider industry. Their guidance documents have a high standing and reflect the opinion of a broad cross-section of stakeholders.

Project technical team

MWH has an extensive track record of retrofitting solutions to surface water management in urban areas in the UK and abroad, including surface water separation schemes and SuDS. They have also been engaged in some of the innovative thinking for retrofitting surface water management with sewerage undertakers and recently produced CIRIA's guidance on ***Retrofitting to manage surface water***. **MWH will lead the project team** which includes an economist familiar with approaches to assess the range of benefits likely to be provided by SuDS. The team will also be augmented with specialist SuDS practitioners as required.

University of Sheffield will assist with the literature review, collation of case studies develop synergies with relevant international initiatives and provide an internal review of processes and outputs. Professor Richard Ashley from University of Sheffield was also involved in the earlier CIRIA retrofitting project and internationally is very well placed to obtain useful input on initiatives.

Halcrow (now part of CH2M Hill) has been assisting the Environment Agency with phase 1 developing a web-hosted national database to capture and share costs and benefits of surface water retrofit pilot projects being undertaken. In the UK Halcrow is developing a drainage strategy framework (for Ofwat and the EA) and a surface water removal planning framework (for UKWIR). They also have expertise in assessing and delivering surface water retrofit programmes in many USA cities.

Approach and methodology

The extensive contacts of CIRIA, the project team and partners will be used to exploit synergies with other initiatives and organisations to produce consensus based guidance, tools and disseminate outputs.

The project will be managed to foster collaboration and consensus as well as utilise extensive links and momentum with related initiatives and others in the industry.

The project will utilise consultation approaches and a Project Steering Group to secure input from diverse disciplines such as engineers, landscape architects, planners, urban designers, green infrastructure practitioners, investment planners, consultants, developers, sewerage undertakers, regulators, third sector workers and regulators to ensure that the outputs are informative and efficiently targeted.

The project will involve the following work stages:

1. **Communications and implementation strategy** – this will be a living document setting out the approach to stakeholder engagement during the delivery and implementation stages of the project. Engagement (both national and international) will support key stages of the project including the consultation, literature review, collation of case studies and development of the guidance and tools. The strategy will have to evolve and respond to opportunities and particularly challenges as the project progresses. *[Stage 2a and 2b]*
2. **Initial consultation workshop** – consultation at this stage will help ensure that high-level issues are highlighted at the beginning of the project and encompassed within the project objectives, methodology and future methodology. This will provide an early opportunity to highlight the approaches to delivering SuDS (planning, design and management) and the potential benefits that might arise. (The output will be summarised and circulated externally as part of the project and fed into the PSG). *[Stage 2a]*
3. **Literature review and collation of case studies** – This will involve the collation of information, literature and case studies on the assessment of SuDS benefits (both new-build, retrofit, proprietary products and landscaped approaches) as well as green/blue infrastructure from national and international sources (Natural England have a specific project looking at tools). Key learning points for approaches in the UK will be obtained from the case studies and literature. This exercise will include:
 - Collation of case studies particularly those including costs and benefits of new build and retrofit SuDS delivery from the UK and overseas (eg USA, Australia and other parts of Europe)
 - Review of literature sources, frameworks, methodologies and process for assessing the benefits and costs of SuDS delivery and blue/green infrastructure for inclusion in a scoping report. Initiatives and approaches include:
 - The Environmental Valuation Reference Inventory (EVRI) and other valuation databases
 - The Economics of Ecosystems and Biodiversity – TEEB Manual for Cities: Ecosystem Services in Urban Management
 - Centre for Neighborhood Technology – The value of green infrastructure – a guide to recognising its economic, environmental and social benefits.
 - American proponents of green infrastructure – e.g. Banking on green (how green infrastructure can save municipalities money and provide benefits for the community)
 - Natural England – e.g. Microeconomic evidence for the benefits of investment in the environment – review and other relevant initiatives.
 - Defra/Environment Agency – working on valuing ecosystem services, delivering multiple benefits from FCERM (e.g. work on Mayesbrook river restoration)
 - Green infrastructure northwest – Building natural value for sustainable economic development – the green infrastructure valuation toolkit user guide
 - New Economics Foundation – Social Return on Investment for assessing the monetary value of socio, environmental and economic benefits.

- SKINT EU INTERREG IVc project guidance – Selling Sustainable in SKINT (SKINT Water Series)
 - Review of the current and potential frameworks for funding, investment planning and infrastructure decision making used by those organisations likely to be delivering SuDS. This will include the main sources of partnership funding relevant to SuDS. **[Stage 2a]**
4. **Draft scoping report** – this will set out the scope of the project, outlining the approach, potential benefits that will be assessed and how the approach could potentially be used and incorporated within relevant organisations investment/decision making processes. The contents of the interim guidance and structure will also be presented to the PSG. **[Stage 2a]**
 5. **Development of interim guidance and tools** – following the literature review and feedback on the scoping report interim tools and a process will be developed. The guidance will be directly related to supporting the use of the tools rather than providing the contextual benefits (this will be developed in later stages) **[Stage 2b]**
 6. **Application, testing of guidance and tools and provision of support** – two support workshops/surgeries will be provided during the course of this stage where the tools and guidance will be applied to real schemes and the contractors will work with those delivering projects on the ground. This will culminate into a broader consultation workshop to include those that have and haven't used the tools and guidance. **[Stage 2b]**
 7. **Refinement and further development of guidance and tools** – information obtained from earlier project stages and feedback on the use and application of the tools and guidance will be used to develop the them further. The guidance documents will be written with the specific requirements of the target audience in mind. (Draft documents will be reviewed by the PSG). **[Stage 2b]**
 8. **Production of dissemination material** – As well as the guidance documents a PowerPoint presentation (together with notes) will be developed. The guidance will be complemented by webpages summarising the generic guidance placed on www.susdrain.org. **[Stage 2b]**
 9. **Publication and dissemination workshops** – Three regional workshops will disseminate the final guidance to a wide audience. Linkages with other initiatives like the Green Infrastructure Partnership, LANDFARM etc will also be explored. **[Stage 2b]**

The programme has been split into two phases to enable early delivery of initial review with the funding already available. It is designed to maximise engagement, consultation and dissemination of information from the project through a variety of communication channels, including the main CIRIA website, www.susdrain.org, LANDFARM websites and other relevant journals. The programme will also ensure that stakeholders have the opportunity to provide feedback and input into the final outputs. During the Project Steering Group meeting, CIRIA asks members of the PSG to act as champions to promote the project and use of the outputs.

Project information

The total project cost is £300,000 (including contributions in kind from industry etc). With stage 2a costing £110,000 and stage 2b costing £190,000 The total programme is likely to be 20 months.

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