Giving new environmental value to derelict green areas and fringe areas

In a nutshell

SUMMARY
It is best practice to adopt a plan to restore derelict green areas and fringe areas in the territory of the municipality in order to remove pollutants from soil and water, improve the habitat for wildlife, reduce the urban heat island effect and protect against soil erosion and floods, while offering recreational green areas for the local residents.
Target group
Public administrations responsible for the management of green urban areas.
Applicability
This best practice is applicable to all local authorities responsible for land use planning.
Environmental performance indicators
• Adoption of a plan for the restoration and environmental management of the derelict green areas and fringe areas within the urban area (y/n)
Benchmarks of excellence
N/A

Description

As urbanisation increasingly puts heavy pressure on open space, efforts to preserve urban green areas have been growing in recent years. Acknowledging that they contribute to their climate and environmental policy objectives, the European Commission promotes their preservation by incorporating them into national and regional policies across the European Union (EC, 2013). At country level for instance, in Germany, the Federal Government promotes their preservation by incorporating them into its national strategy on biodiversity protection (Federal Ministry for the Environment, Nature Conservation, Building, and Nuclear Safety, 2007). A major challenge in efforts to preserve urban green areas is to highlight their benefits for human development and the environment. In particular, several researchers and organisations have reported the positive effects on well-being, human health and particularly on biodiversity by providing important habitat to hundreds of species (Mitchell and Popham, 2008; Cornelis and Hermy, 2004; Krekel et al., 2015).

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This best practice covers two related types of green / brown areas of relevance in the environmental management of towns and cities: derelict green areas, which have been designated as parks or natural areas but no longer provide optimal environmental value and should be restored; and fringe areas i.e. buffer zones which are usually located at the outer edge of urban settlements and are most at risk of urban sprawl. In both cases the following technique focusses on the

improvement of the environmental value of the sites.

Fringe and derelict green areas are subject to strong tensions from decision makers and urban developers. In particular, abandoned and fringe areas around the core of the cities are threatened because usually they suffer from the symptoms of environmental degradation e.g. illegal dumping, abandoned gravel pits, quarries, illegal bonfires (Beatley, 2012). Fringe and derelict areas associated with urban centres have become numerous, larger and more complex with rapid urbanization. The environmental degradation of these areas is inevitably associated with loss of agricultural land, sometimes unauthorized rapid urban development (urban sprawl), industrial operations, and other environmental issues, which significantly alter the ecosystems.

The urban fringe areas are zones between urban and rural areas where urban and rural activities exist and interact. This interaction may result in positive and negative results. One important positive aspect is the creation of synergies; for instance, the presence of an attractive agricultural landscape, which combines operations like recreation, biodiversity conservation water management and employment creation/growth. On the other hand, the negative aspects can be the presence of a polluting industrial site (or in general the existence of industrial activities) in the urban fringe zone, which leads to depreciation of neighbouring housing (and farmland). Therefore, the public administration (local and/or regional scale) should balance carefully both aforementioned aspects and eventually favour the best usage (SURF, 2012).

The main reasons that fringe areas are not incorporated adequately into an overall sustainable urban management planning are linked to the rapid urbanisation process and the governance of the urban areas (Clark, 2009) and in particular:

- The existing planning capacity is overwhelmed by an ever increasing task
- Urban governance and planning: the fact that in the fringe areas, limited urban planning rules, regulations or planning capacities are in place.
- Land use and speculation: the exploitation of relatively low-cost land by developers for speculation on future expansion rather than immediate development

Valuing green areas

The benefits of maintaining or establishing green urban areas are often perceived as intangible; however, in the face of mounting pressures for other uses and in particular development, a more structured approach can help identify and prioritise the actual benefits that can be expected from a green restoration project.

One of the unique advantages of green areas is the provision of ecosystem services. As described in EA (2011), modern conceptions of ecosystem services represent the convergence of diverse strands of resource protection science and practice that have emerged since the 1980s. The UN Millennium Ecosystem Assessment (MA, 2005) introduced a consistent typology of "ecosystem services" as a basis for assessing the status of global ecosystems and their capacity to support human wellbeing. The MA grouped ecosystem services into four main categories: provisioning, regulatory, cultural and supporting services, which are detailed below:

Table 1: Ecosystem services according to the UN Millennium Ecosystem Assessment

Provisioning services	Regulatory service

Fresh water Food (crops, fruit, fish etc.) Fibre and fuel (timber, wool etc.) Genetic resources (used for crop/stock breeding and biotechnology) Biochemicals, natural medicines, pharmaceuticals Ornamental resources (shells, flowers etc.)	Air quality regulation Climate regulation (local temperature/rainfall, greenhouse gas sequestration etc.) Water regulation (timing and scale of run-off, flooding etc.) Natural hazard regulation (storm protection) Pest regulation Disease regulation Erosion regulation Water purification and waste treatment Pollination
Cultural services	Supporting services
Cultural heritage Recreation and tourism Aesthetic value Spiritual and religious value Inspiration of art, folklore, architecture and so on Social relations (such as fishing, grazing or cropping communities)	Soil formation Primary production Nutrient cycling Water recycling Photosynthesis (production of atmospheric oxygen) Provision of habitat

Looking specifically at urban fringes the SURF project has identified that they provide significant value on the following dimensions (Thomas and Wishardt, 2013 and SURF, 2012):

- Providing urban residents with access to nature and recreation
- Protecting nature, providing ecosystems services for towns and cities and conserving biodiversity
- Providing space for urban expansion such as housing and industry
- A location for urban support services like waste transfer, energy generation, water supply, sewage treatment, recycling facilities and landfill sites
- Transport infrastructure
- A location for urban support services such as waste transfer, energy, production, water supply
- Providing food for the towns and cities
- Location for more sustainable living
- Sites for major transport infrastructure, airports motorways etc.
- A source of health and wellbeing
- A source of cultural identity and regional heritage
- A source of enterprise and productivity

Restoring and valuing green areas: principles and approach

The approach to best practice management of derelict and fringe areas can be governed by the concept of green infrastructure. Green infrastructure addresses the connectivity of ecosystems, their protection and the provision of ecosystem services, while also addressing mitigation and adaptation to climate change. It contributes to minimising natural disaster risks, by using ecosystem?based approaches for coastal protection through marshes/flood plain restoration rather than constructing dikes. Green infrastructure helps ensure the sustainable provision of ecosystem goods and services while increasing the resilience of ecosystems. The concept is central to the overall objective of ecosystem restoration. It also promotes integrated spatial planning by identifying multifunctional zones and by incorporating habitat restoration measures and other connectivity elements into various land?use plans and policies, such as linking peri-urban and urban areas or in marine spatial planning policy. Its ultimate aim is contributing to the development of a greener and more sustainable economy by investing in ecosystem?based approaches delivering multiple benefits in addition to technical solutions, and mitigating adverse effects of transport and energy infrastructure.

In addition, the social value of restored green spaces has to be highlighted, in particular when engaging with local residents and broader members of the community. White (2013) identifies a small but significant impact of the availability of urban green spaces on the mental health of the population which can enjoy it. Green spaces also offer an excellent medium for educational and awareness-raising efforts on the value of the environment at local level.

Finally the environmental benefits in terms of reduced air pollution, soil remediation or water quality improvement can also help governments meet regulations and reach targets at local, national and European level.

Restoring and valuing green areas: practical steps

In practice, fringe and derelict areas can be restored and improved by applying various measures. Nowadays, urban agriculture has inspired designers to create mobile modular storage/office/educational space specifically geared towards urban farms. One important challenge is to give quality to the planning areas and buildings within fringe areas taking also into account the potential local and regional interactions while respecting the environmental rules in place. For instance, a well-designed housing area can contribute to the conservation of the local biodiversity. In particular, it can improve water quality by installing green roofs and purifying the collected water or generate energy from photovoltaic panels or from geothermal sources (SURF, 2012). On the other hand, some municipalities manage their fringe areas by appending land adjacent to the city limits as an instrument to control growth (Heimlich and Anderson, 2001).

Specific measures/actions that can be implemented by the public administration are outlined in the following bullet points (SURF, 2012; Heimlich and Anderson, 2001):

- Fringe/formerly derelict areas must be clean, clearly signposted, well-connected and easily reached by all members of the community
- On-site renewable energy generation should be included in fringe/derelict areas, if feasible, based on local renewables available (e.g. solar/PV panels etc.)
- Where a new development is proposed in fringe and derelict areas, both pedestrian and cycle paths should be included (ensuring the good connectivity with the metropolitan area of the city)
- Green roofs, sustainable urban drainage systems, and other mitigation measures to reduce surface water run-off as close to the source as possible, can be encouraged
- Construction of features that ensure flood minimisation should be designed and implemented at the earliest possible stage
- Public open space should be maximised and incorporated into a network of existing and new open spaces
- Establish strategic approaches to urban fringes with special attention to green infrastructure and spatial planning
- At regional / national government level, provide guides for government policies and actions on the pattern and intensity of land use, the provision of public facilities, including transportation and development of human and

natural resources

- Identification and evaluation of area housing, employment, education and health needs and plans to meet those needs
- Preparation of regulatory and administrative measures to support the entire plan.

Public administrations have the opportunity to support the implementation of the aforementioned measures/actions using the tools below: (SURF, 2012):

- Communication and stakeholders' participation through awareness raising, education etc.; the buy-in from a majority of the citizenship is essential to maintain the value of newly improved areas in the long term. The communication effort can be carried out by the use of online tools like special platforms where experts or local people can express their opinion and leave valuable feedback, town hall meetings, open days etc.
- Regulation and local conditions: specific formal and legal procedures are developed or applied like zoning plans, building permits etc.
- Planning and design: the distribution of activities, the design of areas, structures and buildings in the area are crucial aspects
- Financial tools: important tools that may give funding opportunities in support of the prescribed activities

Environmental benefits

The achieved environmental benefits of this best practice are listed below (EC, 2013):

- Provision of clean water
- Removal of pollutants from air and water
- Protection against soil erosion, rainwater retention
- Improvement of land quality, soil remediation
- Mitigation of urban heat island effects
- Disaster prevention (e.g. storms, forest fires, landslides)
- Climate change mitigation
- Improved habitats for wildlife, ecological corridors
- Educational value of flora and fauna
- Well-being for members of the community
- Increase in adjacent land values

One of the most important environmental benefits is the mitigation of the heat island effect. This effect is of particular interest and is clearly demonstrated that both climate change and the urban environment dramatically increase urban risk individually and collectively and these interactions must be integrated into urban planning (Clark, 2009).

The impact of climate change and the associated risks to populations in urban areas is complex, dynamic and dependent on a wide and diverse set of global, national and local urban factors. These interactions are perhaps best exemplified by issues associated with urban heat.

Side effects

As outlined in the best practice on urban sprawl, the management and refurbishment of green areas within towns is a complex and sensitive issue which goes beyond the practice of environmental management, but also encompasses fundamental policy choices for stakeholders in an urban area, underlined by the conflict between development and the preservation of natural capital. In the case of fringe areas or green areas closer to the city centre, there is a conflict between the push to favour denser habitat towards urban centres in order to limit expansion in surrounding (formerly agricultural or natural) land. While this best practice is focussed on maintaining green areas as such and making the most of scarce land resources to maximise their environmental value, broader trade-offs might be reached in local circumstances to achieve a balance between greener and denser urban habitats.

Applicability

This best practice is applicable to all local authorities responsible for land use planning.

Economics

Mayesbrook Park: According to EA (2011), the overall economic benefits of the Mayesbrook Park regeneration are likely to be substantial compared to the planned investment. Assessed over 40 years (and with increase in property values assessed over 100 years), the lifetime benefits of the parkland and river restoration should amount to about £27 million. When compared to the estimated costs of the whole Mayesbrook Park regeneration scheme of just under £4 million (including the river restoration works), this produces a benefit-to-cost ratio of £7 for every £1 invested.

St Helens: The industrial city of St. Helens is located between the cities of Liverpool and Manchester and its population is approximately 100,000 inhabitants. Due to the fact that St. Helens is an industrial city, local authorities wanted to attract more tourism, economy and investments, increasing the quality of life. Therefore an Urban Fringe Action Plan was compiled in 2006, having a special focus on green infrastructure. The two described main points are: i. the Mersey Forest, which for the last ten years has been planting new community woodlands and reclaiming derelict land and ii. the "Countryside In and Around Towns" point, which main aim was to demonstrate how planners can make the most of the open spaces in and around urban areas. The total funding of about £80,000 was secured for the implementation of that urban fringe action plan. Many economic benefits arose from those investments, i.e. the land and property values were increased. The area on the edge of the town, called Bold Moss, transformed into a community woodland. It was reported that the property values in the surrounding area raised by £15 m as a direct result, while the value of new developments estimated approximately £75 m. In the case of the Forest Park was expected to attract over 100,000 new visitors per year and it was predicted that will bring an extra £4 m of investment into the area (Nolan, 2008).

As a general remark, when these economic benefits are put in a relation to the investment cost (assuming they are complete), it becomes clear, that investments in green infrastructure can indeed provide a local government with immediate economic benefits.

Driving forces for implementation

The forces that drive the urban growth are well known and understood. The population growth and household formation result in land use changes by the redistribution of the population. Therefore the careful management of the land use, especially the fringe and abandoned areas, which are located around the metropolitan centre of the cities, must be implemented carefully taking into account the various local environmental parameters e.g. biodiversity etc. Especially at local level, urban ecosystems and urban climate change impacts need to be given more consideration in urban planning.

Reference organisations

- Mayesbrook Park (London borough of Barking and Dagenham)

- Partner cities and organisations in the SURF project (see SURF2012)

- Brixham city has prepared a comprehensive study regarding the incorporation of the nearby fringe areas, which is available online: https://www.torbay.gov.uk/bufmainreport.pdf.

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