



Approaching value added planning in the green environment

Elizelle Juaneé Cilliers

*Unit for Environmental Sciences and Management, North-West University,
Potchefstroom, South Africa, and*

Wim Timmermans

*Van Hall Larenstein, Wageningen University of Applied Sciences,
Wageningen, The Netherlands*

Abstract

Purpose – The purpose of this paper is to link economic value to urban green spaces to enhance the value of green urban spaces, along with the added benefit it can offer to the urban environment.

Design/methodology/approach – As part of the VALUE project (Valuing Attractive Landscapes in the Urban Economy, made possible by INTERREG IVB North West Europe, European Regional Development Fund, European Territorial Cooperation, 2007-2013), this development approach was designed to enhance the planning of qualitative urban spaces by linking an economic value to green urban spaces, to enhance value and meaning.

Findings – Based on case studies conducted in The Netherlands, the approach proves that by linking an economic value to green urban spaces, space is considered differently, authorities tend to prioritize these spaces and additional spinoffs realize.

Research limitations/implications – The notion of green-value is subjective and differs between users, experts and between locations.

Practical implications – The paper provides local authorities with a new approach to spatial planning, considering the economic value of green urban spaces.

Social implications – The paper transforms the way in which green urban spaces are valued and planned; by realizing the intrinsic value of green urban spaces, in terms of social, environmental and economic benefit.

Originality/value – The Value Added Planning approach stresses the need for qualitative planning processes that will enhance future economic value and sustainable development initiatives. The green environment is hard to quantify in terms of economic value, but it is this intrinsic value that can provide future benefit and sustainability in terms of place management and development.

Keywords Place management, Place development, Local authorities, The Netherlands, Urban areas, Green planning, Value added planning, Integrated planning, Sustainability

Paper type Viewpoint

1. Background

This paper is the third in a series of three papers, focussed on value added planning. It builds upon two previously published articles in the *Journal of Place Management and Development*, namely: “Sustainable green urban planning: the green credit tool”

This work is based on the research supported by the National Research Foundation, and the “Valuing attractive landscapes in the urban economy” project, made possible by INTERREG IVB North West Europe, European Regional Development Fund.



(Cilliers *et al.*, 2010, pp. 57-66) and “Sustainable green urban planning: the workbench spatial quality method” (Cilliers *et al.*, 2011, pp. 214-224).

The first paper focussed on the environmental-dimension of planning, considering green spaces as an important issue to protect and suggested methods of compensation to realise the protection of the totality of urban green spaces. It focussed specifically on one tool, the green credit tool. The second paper focussed on the social-dimension of planning, stating that inclusive participatory planning processes can ensure better planning and sustainable development, as a result of social capital that is built, stakeholder involvement and interactive design approaches. It focused specifically on the Workbench method as one such method to ensure participatory planning throughout an entire planning project.

This paper focuses on the economic-dimension of planning, more specifically the additional value of green-spaces that can be added via integrative spatial planning processes. It captures the complexities of green-spaces, and explain that there is indirect values connected to green space (such as social and environmental benefits), but also economic benefits (in terms of direct and indirect benefits where actual figures and money can be connected to the green-space). In an attempt to “convince” authorities of the importance of green-spaces, and stating the need to plan for such spaces, the economic value of the green-spaces is emphasized in terms of monetary issues (measured in terms of indirect benefit) and monetary issues (measured in terms of financial gain). This approach is new to the planning literature, and the contribution made in this article is unique and a point of departure for further research on this topic of economic value of green-spaces and how to measure such value.

2. Introduction

Spatial planning is constantly faced with conflicts between pro-development approaches and pro-environment approaches. Current urban reality reveals that the environment is often sacrificed in order to benefit urban development (Cilliers *et al.*, 2010, p. 23), mainly because green-spaces are seen as a luxury, a visual attribute of the city, and not a necessity. “There is no monetary value connected to the green spaces, as it is hard to quantify and measure it in economic terms” (Commissie Van Ek, 2009, p. 9). Urban spaces (in this context referring to developed urban areas) on the other hand are believed to be more valuable, due to their direct benefit which can be determined in monetary (financial) value. Green urban spaces are mostly defined in terms of indirect benefit, realized in terms of social and environmental benefits.

The economic value of nature (green spaces) is thus not comprehensively defined in literature, but it is worth trying to quantify this value, since green spaces are crucially important to the realization of sustainable development and enhancement of quality of life (Ministry of Agriculture, Nature and Food Quality, 2006, p. 9):

The quality of green spaces helps to define the identity of towns and cities, which can enhance their attraction for living, working, investment and tourism. Green space offers a diversity of land-uses and opportunities for a wide range of activities. Well managed and maintained green spaces contribute to social justice by creating opportunities for people of all ages to interact (Baycan-Levent *et al.*, 2008, p. 2).

The fine balance between the direct benefits and indirect benefits of green spaces are playing a more concrete role in spatial planning approaches. The value added planning approach was introduced to ensure and enhance qualitative green space planning

within developed urban areas, an approach to guide spatial planning approaches towards future sustainability, providing spaces with greater economic value. This article summarizes the value added planning approach within the urban setting, along with the impacts and benefits thereof.

3. Understanding green-spaces

It is commonly accepted that open space and green space are similar concepts. However, current practice proves there is quite some difference between open space and green space, as Table I illustrates.

This research distinguishes open space from green space by means of quality, as well as function and community input. When using the green space design approach to conduct community planning, green spaces move to the forefront in the eyes of the community and developers, as Table II illustrates. The green space design approach favours green space over urban development, as the open space planning occurs prior to development. This results in elimination of fragmentation of open spaces and ensures greenways and green corridors as determined by public policy.

Green spaces provide a unique function to the urban areas. This function and value is not always measured in economic (financial) terms, but the risk of not providing green spaces is too great to take, considering the taxonomy of urban green space values as presented by Baycan-Levent and Nijkamp (2009). The taxonomy, defined a variety of urban green space values, classified according to five categories:

- (1) *Ecological values.* Intrinsic natural value, life-support value.
- (2) *Economic values.* Market value.
- (3) *Social values.* Recreational value, aesthetic value, historical value, therapeutic value, social interaction value, substitution value.

Table I.
Open space vs
green-space

Open space	Green space
Any type of open land	Preplanned and preserved open land
Isolated parcels of open land	An interconnected system of open land
Value may not be known or apparent	Cultural, ecological, developmental, agricultural, recreational value

Source: Greenspacedesign (2010)

Table II.
Planning for open space
vs green-space

Issue	Conventional planning	Green space design
Location of open space	Determined by developer	Determined by public policy and need
Fragmentation of open space	Guaranteed fragmentation	Fragmentation eliminated
Greenways or trails	Piecemeal greenway systems	Greenways guaranteed, prioritized
Timing of open space	Open space planning behind development	Open space planning prior to development

Source: Greenspacedesign (2010)

(4) *Planning values*. Instrumental value, competitive value.

(5) *Multidimensional values*. Scientific value, policy value.

Value added
planning

147

“This taxonomic framework offers a systematic assessment approach which embraces the complex and multidimensional structure of urban green areas” (Leeuwen *et al.*, 2006, p. 4). Open spaces are the result of a lack of planning, whereas green spaces are the result of qualitative, intensive planning. In this way, it is believed that green spaces can contribute to the overall sustainability of urban areas, due to the nature and context that it demands from the spatial planning process.

4. The value of green spaces

A transparent description of the values which arose from the taxonomy of urban green spaces is important in order to define and measure the contributions thereof to urban quality of life. It is broadly accepted that green urban spaces have direct and indirect benefits. Current practice gives preference to indirect benefits (social and environmental benefits), which is believed to be the common benefit of green spaces that will contribute positively to the competitiveness of cities (Baycan-Levent *et al.*, 2008, p. 2). These indirect benefits of green spaces are hard to quantify in monetary terms (Harnik and Welle, 2009, p. 6), and therefore classified as an indirect benefit. Indirect benefits include, but are not limited to:

- *Social benefits*. The most common social benefit derived from green-spaces is the aesthetic value it offers. Ahmed and Hassan (2003, p. 9) conducted a study to evaluate the perception of residents in regards to urban green space values, in relation to socio-economic factors including income, occupation and education. They concluded that the lack of green space and the exponential increase of the population enhance physical, social, psychological and environmental hazards, stressing the need to enhance current green spaces and plan for new (future) green spaces. Various other studies proved that community cohesion is built through the use of green spaces, as users are bound by location and common interest (Kazmierczak and James, 2008; Kuo, 2003; Cilliers *et al.*, 2010). Social interaction is stimulated within the green spaces, contributing to cultural and historic values of the area itself. Human health and mental health are also part of the social benefits of green spaces. A series of studies (Kuo, 2003) has determined that having trees in public housing neighborhoods lowers levels of fear, contributes to less violent and aggressive behavior, and encourages better neighbour relationships.
- *Environmental benefits*. Ecological systems provide various services to human societies. Trees and green spaces are elements of the ecosystems that provide clean air and surface water, provide or renew potable water, and reduce energy consumption, thereby contributing to life support systems. The greatest environmental benefit derived from green spaces is the enhancement of biodiversity. The Center for Urban Forest Research scientists have conducted micro-scale studies, focusing on street tree costs (tree planting, irrigation, pruning and other maintenance) vs calculated benefits (energy savings, reduced atmospheric carbon dioxide, improved air quality, and reduced stormwater runoff) (McPherson *et al.*, 2002). Similar environmental benefits modeling is often based on the economic principle of deferred costs, implying that if trees are not

present, residents or authorities would have to invest in additional engineered infrastructure or equipment to remedy environmental problems (Wolf, 2004, p. 3).

- *Future benefits.* The quality of life or “liveability” which a city offers is important in ensuring its future economic performance. In this regard, environmental resources are assets to a city and green spaces contributes to the competitiveness and marketability. Furthermore, it is far less costly to avoid environmental degradation than it is to live with its consequences, or to repair its damage (Liveable Cities, 2007, p. 26), as illustrated by the beneficial economic model. Green spaces can be viewed as the catalyst stimulating and enhancing the sustainability of an area.

Alongside these abovementioned social, environmental and future benefits (which all has economic spinoffs but cannot be measured directly in monetary terms), green spaces also have economic benefits known as the direct benefits (Perman *et al.*, 2003). Green spaces need to be expressed in these monetary terms in order to become comparable to economic factors (revenue drawn from urban developments) and consequently have more weight in the spatial planning decision-making processes (Luttik, 2000, pp. 161-162), to survive against the susceptibility to urban pressures (More *et al.*, 1988). On these grounds urban green space should have a direct, financial contribution to the competitiveness of places and their economic development (Arvanitidis, 2007, p. 2). The direct benefits of green spaces are not limited to, but include the following:

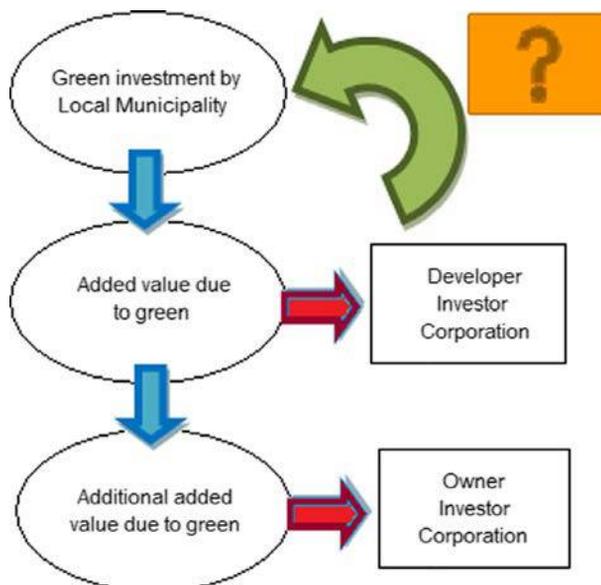
- *Direct benefits.* Green space increases property value. More than 30 empirical studies conducted in Europe have shown that parks have a positive impact (of 20 per cent) on nearby residential property values (Harnik and Welle, 2009, p. 6). This phenomenon is called “hedonic value”. Hedonic pricing examines the effect the environment has on economic decisions through housing prices. From an economic perspective good quality green spaces can add value to the surrounding property, both commercial and residential (Luttik, 2000), consequently also increasing tax returns to local authorities. This was proven in Windsor (Canada) where homes 30 feet from a green space were valued \$6,995 more than those at a mean distance of 1,035 feet (Environment Canada, 1991). In four British Columbia urban communities it was found that a 10-15 per cent increase in property value could be attributed to the land’s proximity to a riparian greenway system (Evergreen, 2009, p. 1). In Bellingham (Washington) it was found that views of natural green space increased property values by an average of 26 per cent (Benson *et al.*, 2000). In regards to commercial property, Wolf (2004) investigated the role of trees on shoppers’ behavior in retail business districts using contingent valuation methods, and found that people are willing-to-pay about 10 per cent more for products in a shopping area with trees, as compared to a comparable district without trees. Studies conducted by Evergreen (2009, p. 4) found that 85 per cent of visitors (tourists) surveyed indicated that they value the green space within cities even more than attractions (including theatre, concert productions and art galleries). A study by Environment Canada (1991) found that greenways can have a positive effect on tourist-spending, an important way to attract business, visitors and residents by guaranteeing both quality of life and economic health (Ives, 1999). Green spaces thus create a favourable image for a place, boosting retail sales, attracting tourism (Woolley *et al.*, 2003) and inward

investment in the area (Cabe, 2006), encouraging employment and skilled labour, thus enhancing production values. Other direct benefits can be found in natural system values as a result of reduction in costs energy-provision, water retention and air pollution.

Spatial analysis methods was created to determine and calculate the value of these (direct and indirect) benefits based on a comparable platform, thus comparing “hard data” (measured on a cardinal scale, in other words the direct benefits), and “soft data” (implying indirect benefits as environmental, social and future benefits). This objective was also used in this study when an appropriate method, to value green spaces, was introduced.

5. Value added planning approach

The value added planning approach aims to determine the impact and benefit of green urban spaces. This is also referred to as value capturing, where the green space values are identified by means of a comprehensive checklist. The value added planning approach furthermore aims to ensure that the initial investment on green spaces is returned to the investor, in most cases, the local authority. When return on investment is given back to the local authority, the willingness of the authority to plan for future green spaces will increase, as Figure 1 shows. The value added planning approach is based on the assumption that adequate, qualitative planning will ensure added value (indirect value in terms of social aspects and environmental aspects, direct value in terms of economic aspects) in the future. Adequate, qualitative planning include a holistic approach to development, focussing on details aspects that will enhance the good perceptions of a place, create visual attractive spaces and ensure sustainable developments with economic benefits.



Source: Amersfoort Local Municipality (2009, p. 60)

Figure 1.
Value added planning
structure

Broadly speaking value added planning is a approach which municipalities can use to strategically justify investment in urban green spaces. The value added planning approach consists of two domains:

- (1) the monitoring domain where an inventory of the existing green space is made; and
- (2) the monetary domain where the focus is on the actual financial returns on investment in urban green spaces, using innovative strategies to either reduce running costs or generating income (Consultancy 644, 2010, p. 30).

It should be noted that the value added planning approach is descriptive in nature, rather than prescriptive, based on the two core domains.

Monitoring domain

This domain makes an inventory of the existing green spaces by listing the various values. This list is meant to incorporate all green space values and benefits stemming from different levels (micro, meso and macrolevel). The purpose is to provide municipalities with a comprehensive and extensive framework of values of green spaces, serving as a checklist to evaluate the current green space status. After the municipality made an inventory they will weight each value, respectively, thus determining the importance of certain values over other green values. This assessment is subjective as each municipality will assess the values on basis of its own preferences, agenda setting and motives. In the end, municipalities will have a list of values scored from most important to least important or redundant. Finally, the most important values and benefits will be taken into consideration in the cost-benefit analysis. Potential methods used to gather green values are also incorporated in this domain and include data collection methods and data processing methods.

Monetary domain

In contrast with the monitoring domain that is occupied with the quantification of different green space values, the monetary domain comprises different strategies municipalities can use to either reduce their running costs (in respect to spatial planning, maintenance, energy consumption or CO₂ emission costs), or generate income (by different taxes and fees or benefit sharing). Here, the emphasis was placed on innovative return on investment strategies to capture the initial green-space investment that was made by the municipality. Since many important values of green spaces cannot be captured by the price mechanism, they were captured as positive or negative externalities, having by default a rather unimportant status compared to values of the monetary dimension. In order to overcome this structural problem, these strategies served as a solution to return the initial green space investment bit by bit by using different means from different sources.

The core domains and elements of the value added planning approach are presented in Table III.

The final step of the value added planning approach is to bring all the data processed and information gathered, either qualitative or quantitative in nature together and set it into a cost-benefit analysis. Within the analysis, important costs such as the investment costs or the ongoing maintenance costs of a certain urban green space, will be evaluated and compared to the benefits that the space can provide, in order to determine if the

Monitoring domain	Monetary domain		Value added planning
	Cost reduction	Income generation	
Accessibility	Citizen participation	Benefit sharing	151
Availability	Emission removal	Entrance fees	
Barrier function	Energy savings	Green proximity tax	
Culture and history	Storm water removal	Green tax	
Education		Parking fees	
Employment		Sewage levy	
Facilities		View warrant	
Health		Voluntary contribution	
Multifunctionality			
Nature			
Production			
Safety			
Substitution			
Cost-benefit-analysis			

Source: Consultancy 644 (2010, p. 31)

Table III.
Value added planning
method

municipality should invest into this particular green space. Whereas, the result of the monetary domain is already translated into a monetary value and can thus be directly integrated in the cost-benefit analysis, the outcome stemming from the monitoring domain cannot so easily be incorporated (Consultancy 644, 2010, p. 38). Ideally, the cost-benefit analysis will be used as an integration of both the monitoring and monetary domains, thus bringing together qualitative and quantitative values of green spaces.

Value added planning approach provides the political arena with a comprehensive basis to first understand the importance of green spaces better and, second, to debate in depth about it using a common ground to plan for these spaces. It captures many innovative ways of ensuring a financial return on investment, either through costs reduction or income generating. The green space investment is strategically orientated as it presumes to link different forms of financial returns as priority to the initial green investment (Consultancy 644, 2010, p. 31).

6. Conclusions and recommendations

Spatial planning is constantly faced with conflicts between pro-development approaches and pro-environment approaches and green space often lose the battle due to a lack of monetary value connected thereto. The significant benefits that green space can provide, along with the urgent need to address sustainability issues worldwide, created the platform to rethink the planning of current urban spaces, especially green spaces, in such as way as to ensure added future value.

Green space planning has the potential to enhance social, environmental and also economic benefits (direct and indirect) as it results in qualitative green spaces. These values should be grasped by local planning authorities, and enhanced by the end-product spatial plans. Although many approaches to determine the value of green spaces exists, the valuation itself remains subjective and location specific.

The proposed value added planning approach recognizes this shortcoming and limit of green space values, and thus sets a framework in which different spaces can be evaluated. This manifest in terms of the monitoring and monetary domains that

attempt to guide local planning processes by means of informed decision-making, understanding of the implications of different development scenarios and awareness of different values connected to different spaces. The value added planning approach can be used on an *ad hoc* basis in different cities and locations, to identify green space values (direct and indirect) and determine the local benefit and revenue that will be gained from protecting, enhancing or planning new green spaces. The value added planning approach tool should however never purely be perceived as a financial investment tool that will monetarily indicate whether or not to invest in green spaces. Rather, the investment decision should be based on both qualitative values and monetary values, where the value added planning approach can be used to identify and compare these values.

References

- Ahmed, M.R. and Hassan, R. (2003), "People's perception towards value of urban green space in environmental development", Paper submitted to the XII World Forestry Congress, 0347-B5, Canada, 23-30 September.
- Amersfoort Local Municipality (2009), *Groenblauwe Structuur*, Presentation at Value Added Workshop, Soest. 25 October, 63 pp.
- Arvanitidis, P. (2007), "Unlocking green space: perceptions and attitudes on various aspects of urban green space", *Green Keys – Urban Green as Key for Sustainable Cities*, Department of Economics and Department of Planning and Regional Development, University of Thessaly, Volos, September 33 pp.
- Baycan-Levent, T. and Nijkamp, P. (2009), "Planning and management of urban green spaces in Europe: comparative analysis", *J. Urban Planning and Development*, Vol. 135, March, pp. 1-12.
- Baycan-Levent, T., Van Leeuwen, E., Rodenburg, C. and Nijkamp, P. (2008), *Development and Management of Green Spaces in European Cities: A Comparative Analysis*, Free University Amsterdam, Amsterdam, 5 pp.
- Benson, E.D., Hansen, J.J., Schwartz, A.L. and Smersh, G.T. (2000), "Pricing residential amenities: the value of a view", *Journal of Real Estate Finance & Economics*, Vol. 16 No. 1, pp. 55-73.
- Cabe, S. (2006), *Paying for Parks: Eight Models for Funding Urban Green Space*, Commission for Architecture and the Built Environment, London, October, 6 pp., available at: www.cabe.org.uk (accessed 1 February 2010).
- Cilliers, E.J., Diemont, E., Stobbelaar, D.J. and Timmermans, W. (2010), "Sustainable green urban planning: the green credit tool", *Journal of Place Management and Development*, Vol. 3 No. 1, pp. 57-66.
- Cilliers, E.J., Diemont, E., Stobbelaar, D.J. and Timmermans, W. (2011), "Sustainable green urban planning: the workbench spatial quality method", *Journal of Place Management and Development*, Vol. 4 No. 2, pp. 214-224.
- Commissie Van Ek (2009), available at: www.amersfoortcreatievestad.nl/site/tags/tag/commissie+van+ek/ (accessed 10 September 2009).
- Consultancy 644 (2010), "The value of nature in cities: towards a better understanding of value added planning", Student Report compiled by Roelofse, M., Gatto, M., Galaieva, T., Ilchuk, O., Mkrtychyan, Wageningen University, Wageningen, 49 pp.
- Environment Canada (1991), *Community Greenspace are Worth Money (Fact Sheet)*, Environment Canada, Ottawa, available at: www.on.ec.gc.ca/community/greenspace/intro.html (accessed 13 December 2009).

- Evergreen (2009), "Common grounds", *Imagine Your City with Nature – Nature of Cities Alberta Professional Workshop Series*, 6 pp., available at: www.evergreen.ca (accessed 14 December 2009).
- Greenspacedesign (2010), available at: www.greenspacedesign.org/what_compared.html (accessed 20 February 2010).
- Harnik, P. and Welle, B. (2009), *Measuring the Economic Value of a City Park System*, The Trust for Public Land: Conserving Land for People, Produced Under a Grant from The Graham Foundation for Advanced Studies in the Fine Arts, Chicago, IL, 28 pp.
- Ives, S. (1999), *The Economic Benefits of Open Space*, The Trust for Public Lands, Santa Fe.
- Kazmierczak, A.E. and James, P. (2008), *The Role of Urban Green Spaces in Improving Social Inclusion*, University of Salford, School of Environment and Life Sciences, Salford.
- Kuo, F.E. (2003), "The role of arboriculture in a healthy social ecology", *Journal of Arboriculture*, Vol. 29 No. 3, pp. 148-155.
- Leeuwen, E., Nijkamp, P. and Vaz, T. (2006), *The Multi-functional Use of Urban Green Space*, Department of Spatial Economics, VU University, Amsterdam.
- Liveable Cities (2007), "The benefits of urban environmental planning", *A Cities Alliance Study on Good Practices and Useful Tools*, York Graphic Services, Washington, DC, October, 162 pp.
- Luttik, J. (2000), "The value of trees, water and open spaces as reflected by house prices in The Netherlands", *Landscape and Urban Planning*, Vol. 48, pp. 161-167.
- McPherson, E.G., Maco, S.E., Simpson, J.R., Peper, P.J., Xiao, Q., Van Der Zanden, A.M. and Bell, N. (2002), *Western Washington and Oregon Community Tree Guide: Benefits, Costs, and Strategic Planning*, International Society of Arboriculture, Silverton.
- Ministry of Agriculture, Nature and Food Quality (2006), *Estimating the Value of Landscape and Nature*, Ministry of Agriculture, Nature and Food Quality, Hague, 40 pp.
- More, A.T., Stevens, T. and Allen, P.G. (1988), "Valuation of urban parks", *Landscape and Urban Planning*, Vol. 15, pp. 139-152.
- Perman, R., Ma, Y., Mcgilvray, J. and Common, M. (2003), *Natural Resource and Environmental Economics*, Pearson, London.
- Wolf, K.L. (2004), *Public Value of Nature: Economics of Urban Trees, Parks and Open Space: Design with Spirit*, Environmental Design Research Association (edra), Washington, DC.
- Woolley, H., Swanwick, C. and Dunnet, N. (2003), "Nature, role and value of green-space in towns and cities: an overview", *Built Environment*, Vol. 29 No. 2, pp. 94-106.

Further reading

- Active Living Research (2010), "The economic benefits of open space, recreation facilities, and walkable community design", *Building Evidence to Prevent Childhood Obesity and Support Active Communities*, San Diego State University, San Diego, CA, 28 pp., available at: www.activelivingresearch.org/files/Synthesis_Shoup-Ewing_March2010.pdf (accessed 2 March 2010).
- Amersfoort Municipality (2007), *Groene Saldoregeling*, available at: www.amersfoort.nl/docs/bis/raad/2007/raadsstukken/04_april/notitie%20Groene%20Saldoregeling.pdf (accessed 10 February 2009).
- Caspersen, O.H., Konijnendijk, C.C. and Olafsson, A.S. (2006), "Green space planning and land use: an assessment of urban regional and green structure planning in greater Copenhagen", *Geografisk Tidsskrift, Danish Journal of Geography*, Vol. 106 No. 2, pp. 7-20.

- Herzele, A. and Wiedemann, T. (2002), "A monitoring tool for the provision of accessible and attractive urban green spaces", *Landscape and Urban Planning*, Vol. 63 No. 2, pp. 109-126.
- Nijkamp, P., Leitner, H. and Wrigley, N. (1984), "Measuring the unmeasurable", *Proceedings of the NATO Advanced Research Workshop on Analysis of Qualitative Data, Amsterdam, The Netherlands, March 28-April*, 713 pp.
- RICS (2007), "Urban parks, open space and residential property values", *Findings in Built and Rural Environments*, July, 8 pp.
- Roger, S.U. (2002), *Health Benefits of Gardens in Hospitals: Plants for People*, Centre for Health Systems and Design, Bryan, TX.
- Van Zoest, J. and De Vries, S. (2004), "The impact of recreational shortages on urban liveability", *Proceedings of the Conference Open Space, People Space – An International Conference on Inclusive Environments*, available at: www.openspace.eca.ac.uk/conference/proceedings/PDF/Devries.pdf (accessed February 2008).

About the authors

Elizelle Juaneé Cilliers obtained her PhD degree in Urban and Regional Planning (2008) at the North-West University (NWU, South-Africa) and additional Master's degree in Economics (2010). She is a Senior Lecturer at Urban and Regional Planning (NWU), and international researcher for Wageningen University (The Netherlands). She is a professional Town Planner registered at the Council for South African Planners. She specialises in sustainable development, green-planning and spatial planning and design approaches. Elizelle Juaneé Cilliers is the corresponding author and can be contacted at: juaneep@gmail.com

Dr Wim Timmermans is Associate Professor Green Cities at Van Hall Larenstein, Wageningen UR.