

Bridging the Green-Value-Gap: A South African Approach

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Abstract—‘Green’ spaces might be very attractive, but where are the economic benefits? What value do nature and landscape have for us? What difference will it make to jobs, health and the economic strength of areas struggling with deprivation and social problems? [1]. There is a need to consider green spaces from a different perspective. Green planning is not just about flora and fauna, but also about planning for economic benefits [2]. It is worth trying to quantify the value of green spaces since nature and landscape are crucially important to our quality of life and sustainable development. The reality, however, is that urban development often takes place at the expense of green spaces. Urbanization is an ongoing process throughout the world; however, hyper-urbanization without environmental planning is destructive, not constructive [3]. Urban spaces are believed to be more valuable than other land uses, particular green areas, simply because of the market value connected to urban spaces. However, attractive landscapes can help raise the quality and value of the urban market even more. In order to reach these objectives of integrated planning, the Green-Value-Gap needs to be bridged. Economists have to understand the concept of Green-Planning and the spinoffs, and Environmentalists have to understand the importance of urban economic development and the benefits thereof to green planning. An interface between Environmental Management, Economic Development and sustainable Spatial Planning are needed to bridge the Green-Value-Gap.

Keywords—Spatial Planning, Environmental Management, Green-Value-Gap, Compensation, Participation.

I. INTRODUCTION

URBAN green space management is essential to the quality of life and sustainable urban development in cities.

However, in many cases, green spaces are susceptible to land use changes and degradation of the environmental and recreational qualities. The comparative evaluation of existing urban green spaces and networks as well as the elaboration of strategies for the development of urban green networks in cities under conditions of socio-economic and demographic change, are new challenging tasks for urban development and as well as for urban research with respect to improving the quality of urban life [4]. This is even more needed in developing countries, where Green-Planning was no core spatial issue for the past decades and where existing instruments and procedures of green space management are not sufficient to preserve urban green spaces in an adequate manner.

A. Current reality in South Africa

South African cities are characterised by urban sprawl, fragmentation and unsustainable development. This is mainly due to the fact that Spatial Planning is pro-development. Urban development occurs at the cost of green spaces, despite the fact that there are comprehensive environmental policies. There was never a need to plan or protect the green spaces, as space was not limited, as in the European context. This contributed to the fact that green spaces had less value. Thus, the great availability of open green spaces changed into unplanned urban developments, resulting in a decline of the quality of the environments and leading to the creation of the City-Region concept. Gauteng has officially been a global city region since 31 August 2006 and it is set to become the world’s 12th largest city region by 2015, bringing together the three major metropolitan units of Johannesburg, Tshwane and Ekurhuleni to work together to create a globally-competitive region and become active and dynamic spatial nodes [5].

Recently, the objectives and benefits of Environmental Management became more relevant and needed, and brought a new area into the spatial approach and planning of the urban areas in South Africa. As environmental considerations gained more support and priority it led to further political conflicts within the Gauteng City Region.

Currently Environmental Management and Spatial Planning are viewed as having conflicting objectives. Environmental management is green-driven, and Spatial Planning is development-driven. This created the departure point of the Green-Value-Gap. The Green-Value-Gap is therefore an elementary issue to address in order to ensure future sustainable development within the South African urban environment.

B. The Green Value Gap

Value is usually determined and quantified from an economic perspective. Green value is a more complex issue as it cannot always be related to a quantifiable economic value. This creates a ‘value gap’ [6]. The ‘value gap’ is the gap in understanding the concept of green areas with economic value. The Green-Sector does not understand the Financial-Sector, and the Financial-Sector does not understand ‘green’. This is the core issue of the Green-Value-Gap. It can also be translated to the conflicting objectives of the current Spatial Planning and Environmental Management approaches.

The Green-Value-Gap can only be bridged once all the stakeholders understand the totality of the relevant concepts. Stakeholders need to realise the need for an interface between green-spaces and economic development, and seek for ways to enhance sustainable development and to create a sense of place and qualitative environment.

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Economic development is just as needed as environmental protection. The aim is to balance these approaches in order to ensure sustainable development. The Department of Environmental Affairs and Tourism in South Africa conducted research to determine which elements of development have the greatest impact on the environment, and whether it is positive or negative. This is used as a point of departure to make stakeholders aware of the pro's and con's of environmental management versus economic development [7]. Table 1 illustrates these impacts.

TABLE I
DEVELOPMENT ELEMENTS IMPACTING ON THE ENVIRONMENT

Development	Environment	
	Positive Impact	Negative Impact
Human settlement	<ul style="list-style-type: none"> Enhances diversity Improves quality of life Addresses basic human needs 	<ul style="list-style-type: none"> Changes land use Increases population density Requires infrastructure Promotes urbanisation Unsustainable land uses
Transport	<ul style="list-style-type: none"> Enhance economy Movement of people Movement of goods 	<ul style="list-style-type: none"> Greenhouse gas emissions Fragment natural habitat Risk to human safety
Agriculture	<ul style="list-style-type: none"> Generators of foreign exchange Alleviate household food insecurity 	<ul style="list-style-type: none"> Transformation of natural habitat causes fragmentation Reduces biodiversity Degradation Lower sustainable livelihood
Spatial planning	<ul style="list-style-type: none"> Conserve both built / natural environments Influences direction of spatial development Mobility routes Location specific Influences intensity of land use 	<ul style="list-style-type: none"> Poor spatial planning can be disastrous for environmental management and urban sustainability

Sustainable development in this context incorporates both approaches as described above, the economic urban development, and environment management. Thus, these concepts need to be integrated and implemented in the current reality and South African approach.

II. UNDERSTANDING THE VALUE GAP

A. The Green Perspective: Benefits

Green value is hard to quantify. Economic science determines these costs and benefits of 'green' in terms of the value of health, experience and pleasure [2]. These costs and benefits impact on the liveability of the future of cities. Liveability is defined in terms of the interaction between a community and the environment [8]. The value of green spaces is thus described as the region's life support system which provides multiple social, economic and environmental benefits [1]. In order to assign a value to green spaces, it should be clear what is countable as being urban green. Green value usually includes "public goods" in terms of parks, views, open space, walkways and amenities that add more value [6]. However, green space planning includes a wider range of "public goods" and characteristics of green.

The grey-green continuum is used to illustrate the range of green planning, and include elements even if it is not strictly 'green' in land use terms. Elements that are classified as

'grey', but which contribute to the wider functioning of green infrastructure are also part of the green infrastructure network. The colour chart illustrates the different forms of green and different values of green. The green-grey continuum concept may help to overcome the lack of obviousness of green infrastructure compared to grey infrastructure, which is well understood in the planning process [8].



Fig. 1 Grey-green Continuum

The following is a summary of the core issues and related to Green-Space-Planning, aimed to inform the Financial Sector about the benefits and the needs of Green-Planning.

In terms of social aspects: Studies proved that employees with a view on green spaces, experience less job pressure and have greater job satisfaction. Nature increases worker productivity. Psychologists have found that access to plants and green spaces provides a sense of rest and allows workers to be more productive. This will result in economic benefit, although it cannot be accounted for initially.

In terms of health aspects: People's everyday environments are of great importance to their stress levels and health [9]. Beyond aesthetics and emotional well-being, green spaces perform important functions that protect and enhance city dwellers' health and property and create a sense of place. Therefore, good quality green space plays a vital role in enhancing the quality of urban life [3].

In terms of economic aspects: Quality landscaping means quality goods. Recent studies found that consumers would be willing to pay, on average, a 12% premium for goods purchased in retail establishments that are enhanced by quality landscaping. Green spaces will also increase retail activity as it will attract shoppers and residents to urban areas, spurring economic growth. This will lead to business growth. Furthermore, it has been shown that well-planned improvements to public spaces within town centres can boost commercial trading by up to 40% per cent and generate significant private sector investment. Urban design improvements undertaken as part of a wider strategy can have even more dramatic results [10].

B. The Green Perspective: Impact on Development

Green spaces have a definite impact on development, as well as on the value of the development. There is a significant link between the value of a property and its proximity to parks, greenbelts and other green spaces, although the market value of green spaces is hard to quantify [11]. It was proven that green spaces can improve property value [12]. The higher price paid by customers for houses that have green spaces compared with those without green spaces, directly reflects the market value of the green spaces. Studies in Boulder, Colo indicated that property values decreased by \$4.20 for each foot

away from a greenbelt. In the towns of Emmen, Appeldoorn and Leiden in the Netherlands, it has been shown that a garden bordering water can increase the price of a house by 11% per cent, while a view of water or having a lake nearby can boost the price by 10% per cent and 7% per cent respectively. A view of a park was shown to raise house prices by 8% per cent, and having a park nearby, by 6% per cent. All these public green spaces are highly valued by all residents and mostly used for recreational activities [10]. The increase in property prices is a reflection of the increased value, due to the added 'green'. The value of green spaces is thus measured in terms of social value, recreational value, environmental value, which all have economic spin offs. The Financial sector should realize that green spaces can contribute to the quality of an urban area and thus accordingly add economic value.

C. The Financial Perspective: Benefits

Urban spaces shape the identity of an area, which is part of its unique character and a sense of place [10]. Continuous investment is needed within these urban spaces, in order to preserve the character of a place. Good-quality public spaces can ensure social opportunities for recreation, exercise and learning [10]. Investments from urban development are ploughed back into the urban spaces, mainly to protect the natural values and to increase social and recreation facilities. Urban development can furthermore reduce crime via adequate lighting, security measures and visual planning and designs. Such changes can help everyone to make the most of public spaces [10]. Urban development ensures adequate services and facilities that can be used to enhance the value of the green spaces. Urban development thus creates opportunities which open spaces can fulfil [13].

Planned urban expansion and development can thus enhance green spaces and even add value to the green areas. Environmentalists need to realize these benefits and must not see urban development as the enemy of Green-Planning.

D. The Green Perspective: Impact on Green

Planned urban development can enhance natural beauty and protect the environment. Planned urban development can be realized via integrated node development. The urban nodes and green nodes should be planned holistically to enhance the uniqueness and character of the individual nodes. It should furthermore support one another and ensure qualitative urban development along with qualitative open space planning. Urban development is measured in financial terms and therefore much easier to quantify, therefore urban development tends to take preference over environmental management. The outcome of urban development can be determined, whereas the outcome of green planning is only an estimate. Green-planning however needs the financial and spatial support of the urban development.

III. BALANCING THE VALUE GAP

The value gap can only be bridged once the two approaches (environmental versus developmental approach) are balanced.

To help balance the needs of urban development and green space provision, planning authorities need to develop a vision of the value and role of green space which is shared by local key partners and citizens and is clear to developers. This in turn needs to be based on a rigorous assessment of the adequacy of existing green space provision and the way it needs to be improved [3].

The following steps are proposed to balance the value gap in South African urban areas: (A) Understanding the value gap (refer to section II - create awareness between stakeholders), (B) Policy alignment (aligning different spatial and environmental policies), (C) Participation (incorporate community involvement, stakeholder commitment to ensure success) and (D) Compensation (realizing that no ideal situation exists, and seek ways to create acceptable compensation methods between urban economic development and environmental protection). These steps are described accordingly.

A. Understanding the value gap

The following table illustrates the benefits that Green-Planning has on Urban Development, and the benefits that Urban Development has on Green-Planning.

B. Policy alignment

The current Environmental- and Spatial policies guiding development in South Africa needs to be aligned in order to bridge the current Green-Value-Gap. Alignment of the applicable policies will ensure the successful interface between spatial planning, environmental management and economic development. Practitioners in environmental management and spatial planning in both the public and private sectors have interpreted this interface for different reasons in various ways. The evolution over the past decade of policy and legislative frameworks directing these processes did not necessarily promote a common understanding of the interface between the processes involved [14]. Spatial planning is guided by the Development Facilitation Act (DFA) and the Spatial Development Frameworks (SDF) and environmental planning is guided by the National Environmental Management Act (NEMA) and the Integrated Environmental Management Framework (IEM). There is considerable commonality between spatial planning and environmental management [15]. The principle of sustainable development is notably the most important commonality and should guide the alignment of these concepts. These core guiding legislations are discussed accordingly. Spatial planning: Since the promulgation of the Development Facilitation Act (Act 76 of 1995) the concept of integrated development planning forms the focal point of spatial planning in South Africa. The Integrated Development Plan (IDP) shares striking similarities with a range of other international ideas and practices [16]. By 1995, integrated development planning had emerged as a distinct approach to planning. The ideas of integrated planning in South Africa were further entrenched in other core policies and legal documents [14].

TABLE II
UNDERSTANDING THE VALUE GAP

Core elements	Detailed elements	Environmental benefit	Economic benefit
User quality	Accessibility	Access enhances recreational and social well being	Access creates opportunities
	Management	Qualitative environment	Job creation via management structures
	Functionality (use)	Meaningful development will add environmental value	Meaningful development will ensure better profit margins
Perception	Partnerships	Sustainability of the environment	Enhance the success of development
	Experience	Sentiment increases	Interactive planning ensure successful implementation
	Spatial perception	Enhances youth development and community building	Contribute to wider urban objectives such as job opportunities
Natural quality	Control	Reducing air pollution, controlling storm water runoff	Keep cities cooler, minimize air-conditioning expenses
	Sustainable resources	Pollution control	Farming expenses
	Green quality	Quality of life increases	The quality of residential areas are increased
Managerial quality	Urban design	Quality of landscape and soft open spaces	Public furniture, linkages and corridors, pathways and layout
	Integration	Nature ensures a more beautiful living environment.	Uplift the surrounding areas. Creates structure and character
	Attractiveness	People prefer natural over urban landscapes	Willing to pay more for green if it is close to the home
Land use	Priority areas	Manifests as cultural-, green-, information nodes	Urban nodes can be strengthened via supporting nodes
	Attract people	Stimulating increased house prices	Good public landscape offers benefits to the local economy
	Attract companies	Returns on conservation, maintenance, green expansion	Turnover and employment generated as result of nature
Land value	Property prices	Upliftment of the totality of the area	Well-planned and managed public space has a positive impact
	Opportunities	Enhances the focus on quality of the area	Quality environment improve trading by attracting people

The urban planning system now has a key role in ensuring there is sufficient high quality urban green space. The pressure for additional housing and business in towns and cities makes existing urban green space attractive as potential developments sites. Planners not only need to ensure green space is protect and enhanced where appropriate, but also need to ensure

suitable opportunities are taken to provide new space when development and regeneration schemes go ahead [3].

Environmental management: South Africa was slow to develop and institute formal procedures for environmental assessment. It was only with the enactment of the Environment Conservation Act (Act 73 of 1989) that provision was made to determine environmental policy to guide decision-making and to prepare environmental impact reports [17]. The publication of a document entitled Integrated Environmental Management (IEM) in South Africa marked the introduction of the concept of environmental management in South Africa, and indicated a general approach that integrates environmental considerations across all stages of the planning and development cycle [17]. Green space strategies now play a key role in ensuring local authorities meeting the expectations of national green space policies.

Strategies should help to articulate an authority's vision for green space, the contribution that green space makes to other services and the goals the authority wants to achieve, plus the resources, methods and time needed to meet these goals [3].

B. Participation

Modifying the development and design process involves a redefinition of priorities, the creation of improved forms of participation and communication, and a shift in the mindsets and patterns of the many participating professionals. It takes time and effort to establish new working relationships, to build knowledge, and to form consensus [18]. This is also the case when approaching to bridge the Green-Value-Gap. The success is subject to adequate and meaningful public participation and stakeholder involvement from the Environmental sector and Financial sector. The community has a particular expertise and needs to be included in the process of Green-Planning and urban development. [19].

The benefits of a meaningful stakeholder process are considerable [18] and should therefore be integrated in the approach to bridge the Green-Value-Gap. Benefits include (1) Collaboration to ensure better achievement of goals and maximize benefits, (2) Communication to ensure a rigorous and intentional communication process to reconcile the multiple points of view, (3) Cost savings through synergistic strategies and permitting more effective solutions to be discovered through direct exchange of ideas and feedback; and (4) Improved performance by adequate knowledge, alternative green design strategies, and accurate estimates.

The Green-Value-Gap can be addressed via meaningful stakeholder involvement. However, there is no protocol for participation. Participation differs between communities and between processes. The tool used to distinguish between the different types and levels of participation, is the participation ladder, without focussing on quality or applicability of the different levels as it is subject to each individual situation [20]. The participation ladder is thus used to determine the most relevant form of participation within the specific circumstances. The participation ladder consists of the following levels [21]:

- (1) Inform: Authorities determine the agenda for decision-making. No actual input by the communities.
- (2) Consult: Authorities determine agenda, but consult the communities in regards to the development.
- (3) Advise: Authorities determine concept agenda, but is open to advice and suggestions from the community.
- (4) Co-operation: Authorities, communities and stakeholders are jointly in the decision-making process.
- (5) Equal rights: Final results are subject to equal preferences of authorities and communities.

C. Compensation

Green compensation is taking place in several municipalities in the Netherlands. One of these municipalities, Arnhem, based its green compensation method on a policy document 'Groenplan 2004-2007'. The main reason for developing the vision on green compensation was to limit green loss within a municipality, and thereby compensating for a certain green loss within a specific area. In separate urban development projects it is possible that green space is lost or gained, but through green compensation there should be no overall loss on a municipal level. In the vision set up by the municipality the following starting points were stated:

- Preservation and reinforcement of green
- Carefully managing the existent and potential qualities
- Green remains green
- Green planning earmarked areas for green development
- Countering fragmentation of green space
- Keeping it clean and tidy
- Maintenance of green

Green compensation is always something that needs to be tailored to the actual situation, but by using the green compensation ladder (a line of conduct on how green can be compensated), it is possible to see where, how and in which ways green can best be compensated. When there is no other option as to replace a current green area with urban development, the compensation ladder can be used. This is a behaviour-analysis that illustrates how green can be compensated. The compensation ladder identifies the green and determines the value of the green, and seeks ways to include the existing valuable green in the development plans. If this cannot be done, then compensation should take place in accordance to the following ladder:

- Implement the same initiative within the same block (green for green – quantitative approach)
- Implement something else within the same block (qualitative approach)
 - Implement same initiative within same region (quantitative approach)
 - Implement something else within the same region (qualitative approach)
 - Financial compensation within green funding project
 - Nothing to be done in terms of compensation

The proposed initiatives (as derived from the compensation ladder) are evaluated within a matrix to determine if the green can be maintained, or replaced, or relocated, or can be taken away? And if the outcome is positive, at what cost? The aim is to get a holistic view on the green totality of the urban area and to ensure that the green totality is protected. Compensation can be realized in qualitative and quantitative ways.

The way of compensation is debatable and subject to the elements impacting on the green value. The core issue remains that 'green should remain green' and therefore be managed carefully to enhance the existing and potential qualities of green.

IV. CONCLUSION

Green planning is needed to ensure that urban life is not ruined to such an extent that it cannot be compensated for in the future. The reality, however, is that urban development often takes place at the expense of green spaces. Urban space management is thus essential to the quality of life and sustainable urban development in cities.

A. Why the results is significant

Third world countries often take the availability of space for granted. Green spaces, if planned and maintained, can transform the urban environments and enhance economic development and quality of life. Urban green management and economic development are mutually supportive aspects of the same agenda. The sustainability of urbanization is only possible with urban greenery [3].

B. Discussion and recommendations

The value gap can be bridged when all stakeholders understand of the complexity of the concept, align guiding policies and legislation, include meaningful participation and introduce qualitative compensation measures. 'Green' issues can be very attractive and still have economic benefits. It can impact on jobs (in terms of pressure, satisfaction, and productivity), health (in terms of stress, emotional well-being, and quality of life) and the economic strength (in terms of retail activity, business growth, and commercial trading) of areas struggling with deprivation and social problems.

The value gap can only be bridged once the Environmental approach and Developmental approach is balanced.

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