

# BARRIERS AND ENABLERS OF GREEN INFRASTRUCTURE IMPLEMENTATION IN SOUTH AFRICAN CITIES

## GREEN INFRASTRUCTURE BRIEFING NOTE

Threats from climate change are no longer an abstract projection but increasingly tangible realities impacting South African cities. Urban green infrastructure plays a vital role in providing ecosystem services to cities. Ecosystem services are benefits generated by natural processes, for example, regulating services (e.g. temperature regulation) or provisioning services (e.g. food crops or building material). These services benefit urban residents directly and are also key to cities' climate change adaptation and mitigation strategies.

In the paper *Green Infrastructure in South African Cities*, Lorena Pasquini and Johan P. Enqvist explore the role and implementation of green infrastructure through the specific lens of its temperature regulating function in terms of the Urban Heat Island effect, because urban heat stress is expected to become an increasing and critical issue under climate change. This brief, based on their research, draws out general barriers and enablers for green infrastructure implementation in South African cities.

## WHAT IS URBAN GREEN INFRASTRUCTURE?

Green infrastructure is “the interconnected set of natural and man-made ecological systems, green spaces and other landscape features. It includes planted and indigenous trees, wetlands, parks, green open spaces and original grassland and woodlands, as well as possible building and street-level design interventions that incorporate vegetation. Together these assets form an infrastructure network providing services and strategic functions in the same way as traditional grey infrastructure”<sup>1</sup>. Internationally, cases have demonstrated that green infrastructure in some instances provides critical services in a more cost-effective way than conventional infrastructure, can help to mitigate negative impacts of traditional infrastructure, and holds the potential to be more sustainable in the long run, as well as being able to provide a range of other benefits to society.

## URBAN GREEN INFRASTRUCTURE & SOUTH AFRICAN CITIES

The *National Strategy for Sustainable Development and Action Plan*<sup>2</sup> outlines the national government's commitment to follow a pathway of green growth and respond to the growing concerns of climate change. “Green growth” is intended to ensure economic development while transitioning to a more sustainable and resilient development pathway. While national in origin, the commitment is to be carried out across all levels and sectors of government including municipalities.

<sup>1</sup> Culwick, C.G. & Robbins, K. 2016. *A framework for a green infrastructure planning approach in the Gauteng City-Region*. Gauteng City Region Observatory Research Report No. 4, Gauteng City Region Observatory, Johannesburg.  
<sup>2</sup> Department of Environmental Affairs, 2011. *National Strategy for Sustainable Development and Action Plan* (NSSD 1) 2011-2014. Available online at: [https://www.environment.gov.za/sites/default/files/docs/sustainabledevelopment\\_actionplan\\_strategy.pdf](https://www.environment.gov.za/sites/default/files/docs/sustainabledevelopment_actionplan_strategy.pdf)

## BARRIERS TO GREEN INFRASTRUCTURE IMPLEMENTATION

Drawing on published literature and case studies from the City of Cape Town, the City of Johannesburg and Manguang developed through interviews with municipal staff across different environmental, city planning and parks departments, as well as private sector consultants, this research concluded that there are four basic barriers to green infrastructure practices in South African cities:

### BARRIER 1: INVISIBLE BENEFITS

As a new concept in South Africa, green infrastructure does not fit into established ways of planning and managing cities. Planning and development priorities are often driven by the urgent need for basic service delivery provision. The concept of green infrastructure is not accommodated in current models and systems for categorisation and evaluation of projects. Since this is what determines budget allocation, inadequate or incorrect 'substitute' categorisations fail to capture the value of green infrastructure, which means that conventional or 'grey' infrastructure projects are more likely to be regarded as better options.

#### ENABLERS

- Develop and/or adopt evaluation and assessment tools that make the economic and social value of green infrastructure more explicit. Link such tools to existing city planning to assist municipal governments to understand the value of green infrastructure and integrate it into decision-making and budget allocation processes.
- Communicate the benefits of green infrastructure projects in a consistent and clear way to address perceptions within local government and the wider public.

### BARRIER 2: PATH DEPENDENCY

Since grey infrastructure has been the norm for so long, the accepted 'way of doing things' poses a barrier to breaking away from this specific development pathway. In most municipalities skills, resources and capacities are biased toward the conventional approach of service delivery, which makes it hard to experiment with, and adopt, a new approach that would enable the implementation of green infrastructure projects.

#### ENABLERS

- Existing legislative and regulatory tools can be leveraged to enable green infrastructure implementation. For instance regulations around Environmental Impact Assessments or guidelines for issuing development and building permits can be adjusted to include green infrastructure requirements, encouraging shifts in conventional approaches and associated path dependencies in the larger system.
- Invest in small-scale green infrastructure experiments that provide the opportunity to rethink planning and management processes and build the necessary capacity.

- Path dependency in local governance can be counteracted by promoting collaborations across municipal departments as well as with targeted actors such as developers and landowners. Similarly, setting up knowledge-sharing networks with partners such as universities, research institutes and consultants can help provide new expertise and data that has been lacking in previous ways of operating.

### BARRIER 3: PRACTICAL IMPLEMENTATION

Constraints also exist related to the practicalities of putting green infrastructure into practice. Specifically, there are several knowledge gaps regarding the details of operationalising green infrastructure, i.e. putting it in place and maintaining it, including how to integrate it with existing conventional infrastructure, and knowing what ecological functions to promote to cope with climate risks.

#### ENABLERS

- Assess the availability of context-specific data and implement plans to improve data availability and analysis (such as partnering with local universities and institutes), especially regarding the climate risks and how green infrastructure might help cities mitigate them.
- Implementation can be greatly facilitated by involving local communities, through collaborative management approaches, in the design and maintenance of green infrastructure. By aligning municipal agendas and civic action, mutual benefits can be generated through cost-saving and increased employment.

### BARRIER 4: INSTITUTIONAL SILOS

Investments in, planning for, and maintenance of, green infrastructure solutions are impeded by the separation of responsibilities between policies and visions developed in environmental or climate change departments, and other municipal departments. The practicalities of implementation and maintenance of such infrastructure fall to various city departments ranging from spatial planning, environmental management, recreation and parks, and disaster risk management.

#### ENABLERS

- Cross-departmental collaboration can be fostered by strengthening the necessary structures and associated lines of accountability within municipalities to align with the implementation and management of green infrastructure.
- Actively engage with international best practice and utilise local platforms and networks for city-to-city knowledge sharing.



## CONCLUSION

Urban green infrastructure is receiving increased attention in South Africa's main metropolitan areas, but it is under-utilised especially as a tool to combat heat. This research shows that there are a variety of barriers impeding its use, but that there are a variety of ways to address and overcome these barriers. Important steps include better communication, implementation and evaluation systems, skills-sharing that draw together diverse knowledge sets, and engaging collaboratively with key stakeholders within and outside public agencies. Green infrastructure can be costly if implemented incorrectly or in the wrong place. However, if done right it holds the potential to not only deliver the immediate benefits of ecosystem services but also create jobs, protect environmental values, and increase cities' resilience to climate change in the long term.



## ABOUT THIS BRIEFING NOTE

This briefing note was prepared by the African Centre for Cities as part of a package of work commissioned by the Cities Support Programme. This briefing note is a condensed version of a full report entitled *Green Infrastructure in South African Cities* by Lorena Pasquini and Johan P. Enqvist which is available from [www.africancentreforcities.net](http://www.africancentreforcities.net)



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