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Policy Brief: How can investment in Ecological Infrastructure increase water security and alleviate poverty?

SEBEI

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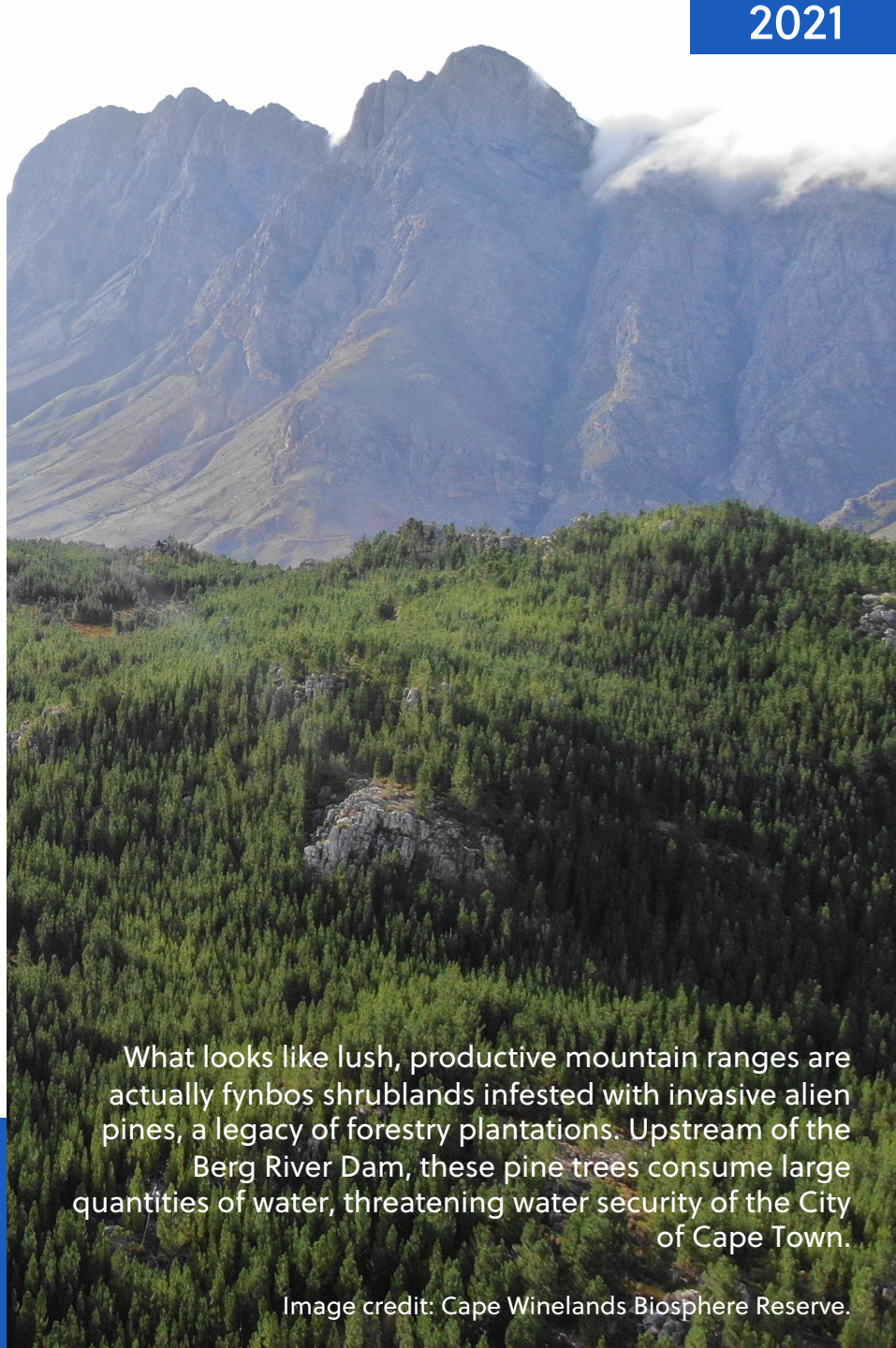

What looks like lush, productive mountain ranges are actually fynbos shrublands infested with invasive alien pines, a legacy of forestry plantations. Upstream of the Berg River Dam, these pine trees consume large quantities of water, threatening water security of the City of Cape Town.

Image credit: Cape Winelands Biosphere Reserve.

Key messages

- Healthy ecosystems are important for maintaining planetary health and for providing critical services to people, such as clean water, reducing fire risk, controlling erosion, and building resilience to drought and flooding events.

- Restoring degraded Ecological Infrastructure through actions such as clearing of invasive alien plants and wetland rehabilitation improves water security in cities, and for businesses, rural communities, and private landowners.

- Employment of poor and unskilled workers in the restoration and maintenance of Ecological Infrastructure improves their income, physical and mental health, skills and competencies, household education, environmental awareness and social networks.

- The multitude of benefits of restored Ecological Infrastructure to nature and society is attractive to a diverse set of investors. These include private landowners for maintaining the productivity of their land, public funders looking for multi-purpose projects, as well as corporates, philanthropists, and impact investors seeking sustainable development initiatives.

- Ecological Infrastructure interventions rarely incorporate sufficient monitoring and evaluation during and after project implementation. This makes it difficult to demonstrate the environmental and social impacts.

- Local to national policy and decision-makers can create an enabling environment for investing in Ecological Infrastructure by providing incentives, alleviating barriers, and supporting effective monitoring and evaluation.

The Socio-Economic Benefits of Ecological Infrastructure (SEBEI) Project

This policy brief is an output under the Danida-funded Socio-Economic Benefits of Ecological Infrastructure (SEBEI) project, which was coordinated by the University of Cape Town and the University of Copenhagen.

The SEBEI project set out to strengthen the case for investing in water-related Ecological Infrastructure in South Africa by combining livelihoods analysis with next-generation hydro-climatic modelling. Through this innovative multi-disciplinary approach, we were able to assess the hydrological and socio-economic impacts of existing Ecological Infrastructure in two strategic catchment areas.

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The Theewaterskloof Dam, which forms part of the Western Cape Water Supply System.

Invasive alien tree invasions upstream of this dam placed additional strain on water security, due to their high water-use.

Image credit: Cape Winelands Biosphere Reserve

Ecological Infrastructure challenges in South Africa

- Degraded Ecological Infrastructure reduces the quality and quantity of vital water supplies needed to support economic activities and domestic water consumption in urban and rural areas of South Africa.
- Inadequate protection and restoration of water-related Ecological Infrastructure can also negatively affect ecosystem services such as flood attenuation, carbon sequestration, soil quality regulation and sediment retention, erosion control and fire risk management.
- The evidence base for the benefits of investing in Ecological Infrastructure is empirically weak due to a lack of effective monitoring and evaluation efforts.
- Sustainable long-term financing of the restoration and maintenance of Ecological Infrastructure at scale is a big challenge in South Africa.

KEY DEFINITIONS

Ecological Infrastructure refers to the underlying framework of natural elements, ecosystems, and functions and processes that are spatially and temporally connected to supply ecosystem services [1].

Ecosystem Services are the benefits people obtain from ecosystems [2].

Ecological Infrastructure Interventions are natural and artificial actions that enhance chosen ecosystem services in intact to transformed landscapes, informed by an understanding of ecology. Examples of natural interventions include alien plant clearing and native species revegetation. Examples of artificial interventions include artificial wetlands, permeable pavements, and erosion control structures [3].

Water-related Ecological Infrastructure Interventions are aimed at increasing water quantity and quality in degraded mountain catchments, including rivers and wetlands.

SEBEI Project Approach

ENGAGEMENT

We engaged key stakeholders to co-create knowledge, strengthen the community of practice, and align activities with ongoing efforts. We did this through workshops in two socio-economically important catchments in South Africa, and through regular interactions with coordinators from other Ecological Infrastructure projects.

FINE SCALE MODELS & DATA

We developed fine-scale-models and data to investigate the water security benefits of different Ecological Infrastructure interventions in the two catchments, including the risk reduction potential of these benefits under climate change.

DIRECT & INDIRECT SOCIO-ECONOMIC BENEFITS

We assessed the socio-economic benefits of Ecological Infrastructure interventions, including benefits to workers from poor communities employed in these projects and landowners relying on water to produce fruit, wine or sugar cane.

FINANCIAL MECHANISMS

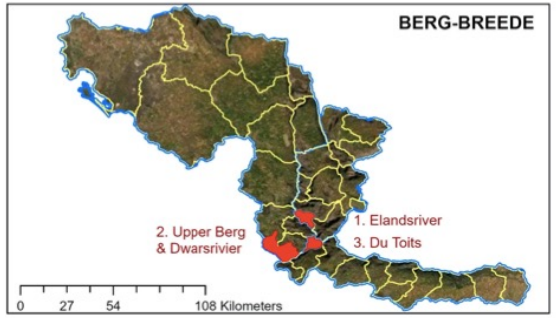
We reviewed, identified, and modelled financial mechanisms for funding the restoration and maintenance of Ecological Infrastructure, with particular emphasis on mechanisms that can be used to attract private sector capital.

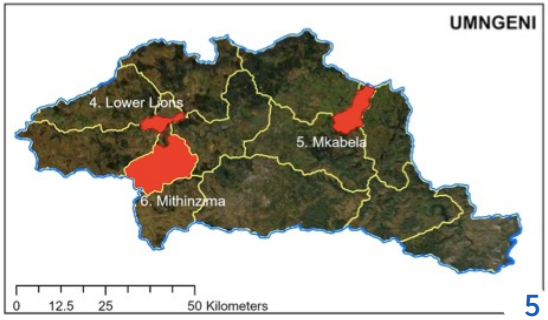
Research Findings

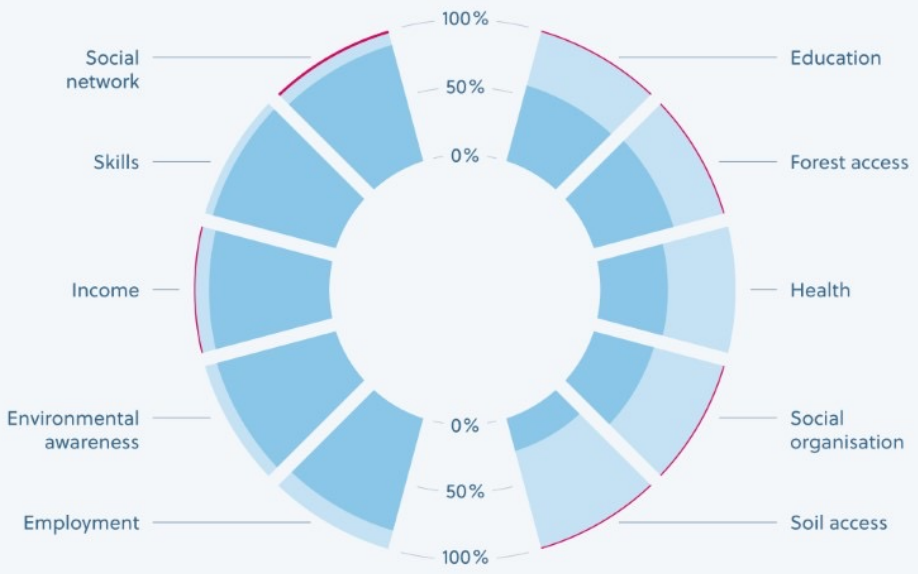
WATER SECURITY

- Investing in Ecological Infrastructure provides significant water-related benefits to society.
- Only a context specific, inclusive, long-term-oriented, and evidence-based approach on Ecological Infrastructure restoration and maintenance can simultaneously enhance water security and contribute to poverty alleviation.
- The restoration and maintenance of Ecological Infrastructure can reduce the impact of climate change on the severity of extreme drought events [4].
- The true water-related benefits of Ecological Infrastructure are likely poorly quantified due to ecological, hydrological and meteorological data limitations for areas important for water supply, such as the Western Cape mountains and the eastern Escarpment, which have complex geology and rainfall patterns [5].

SEBEI study sites







Perceived outcomes due to Ecological Infrastructure

- Increase
- No effect
- Decrease

POVERTY ALLEVIATION AND OTHER SOCIAL BENEFITS

- Ecological Infrastructure restoration and maintenance lead to short-term and long-term income and employment opportunities for workers from poor communities [6, 7, 8].
- Livelihoods of workers involved in Ecological Infrastructure projects improve substantially. Their employment leads to better household education (e.g., payments of school fees), health (e.g., better nutrition, payment of medical bills), environmental awareness, and social networks [7,8]. Intangible benefits, such as increased happiness, pride and self-esteem, also increase for those working on Ecological Infrastructure projects [8].
- When interventions to restore or maintain Ecological Infrastructure are suspended due to funding gaps and shortages, employment options for both skilled and unskilled workers are reduced, resulting in unemployment and missed education opportunities for those already struggling to sustain a living [7, 8].
- Contractors who handle logistics, salaries and supervise the teams of workers gain experience and see opportunities for starting new businesses or advancing their education through Ecological Infrastructure intervention projects.

Image credit: Anaya Katlego, Unsplash

FINANCING ECOLOGICAL INFRASTRUCTURE AT SCALE

- Currently, most funding for Ecological Infrastructure interventions in South Africa is from the public sector or philanthropic donors, many of which are corporates through water stewardship programmes. Internationally, many financial mechanisms exist for attracting private sector capital which require a direct return on investment, of which bonds are the most implemented.

- To explore the application of a bond to Ecological Infrastructure interventions, we modelled the potential return on investment (and bond structure that this could support) that could be generated from clearing and maintaining the Berg River Dam catchment. We found that the intervention could be financed through a 20-year bond, to the value of R80 million, with an annual return on investment of up to 6.9%. However, this is unlikely to be sufficient to entice traditional institutional investors, therefore unique finance solutions, such as blended finance, is required [9].

- Blended finance is the strategic use of public sector, development finance, grants, and/or philanthropic funds to mobilise or leverage private capital that require a specific return on investment. With funding from these sources, which are provided under less favourable conditions (lower return, higher risk, longer tenure), a financial mechanism can be established that allows the private sector to capitalise on the potential returns while benefiting from valuable downside risk protection, thereby enhancing the investment case.

- A further mechanism for providing the private sector with direct returns is the corporate social investment (CSI) mechanism, whereby corporates can earn points for their B-BBEE scorecard as well as tax breaks by contributing to Ecological Infrastructure projects which have a strong social development component. Criteria for receiving these benefits limits its application to specific contexts [9].

Recommendations for Policy and Decision-makers

Build an evidence base for the benefits of Ecological Infrastructure investments by allocating funding to support focused, applied and local empirical research.

Support and strengthen existing institutions and platforms that can facilitate collaboration, learning and upscaling of Ecological Infrastructure investments at the catchment level.

Demonstrate, through systematic monitoring and targeted awareness raising, the multiple benefits of Ecological Infrastructure interventions, in order to stimulate private and public investments in these initiatives.

Dedicate funding to strengthen data and research that improves hydrological modelling and socio-economic assessments to deliver evidence that is sensitive to local contexts.

Allocate resources to the design of financial mechanisms that can show direct returns when investing in Ecological Infrastructure interventions to attract private sector capital. Examples include corporate social investment (CSI) mechanism and blended finance options.

Ensure continuous funding of Ecological Infrastructure interventions to avoid the loss of achieved benefits to society and nature.

Provide investors with a set of comprehensive justifications by packaging site-specific and investor-specific benefits of Ecological Infrastructure investments.

Invest financial and human capital in Ecological Infrastructure as a legitimate, and cost- effective approach to increase South Africa's resilience in the face of water insecurity and climate change.

Raise awareness among end-user water providers on the water related benefits to entice them to increase their financial contributions to the restoration and maintenance of Ecological Infrastructure.

Further reading

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Or visit the SEBEI project webpage

Image credit: Alanna Rebelo

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