



# ECOLOGICAL INFRASTRUCTURE

## NATURE DELIVERING SERVICES

### WHAT IS ECOLOGICAL INFRASTRUCTURE?

Ecological infrastructure refers to **naturally functioning ecosystems that deliver valuable services to people**, such as fresh water, climate regulation, soil formation and disaster risk reduction. It is the nature-based equivalent of built or hard infrastructure, and is just as important for providing services and underpinning socio-economic development.

Ecological infrastructure includes, for instance, healthy mountain catchments, rivers, wetlands, coastal dunes, and nodes and corridors of natural habitat, which together form a network of interconnected structural elements in the landscape.

### ECOLOGICAL INFRASTRUCTURE IS A PUBLIC GOOD

South Africa has **abundant ecological infrastructure**, providing opportunities to **support development** and unlock economic potential. Because ecological infrastructure is **largely free**, its value is seldom captured in market transactions and **we tend to under-invest in it**.

Like other public goods (such as education, health or street lights), investing in ecological infrastructure has positive spill-over effects. And as with other public goods, the **public sector has a central role to play** in ensuring optimal investment in ecological infrastructure.

Biodiversity is the variety of species and ecosystems and the interactions between them. It is South Africa's extraordinary diversity of life that provides a foundation for economic growth (jobs), social development (service delivery), and human well being (a better life).



Ecological infrastructure provides cost effective, long-term solutions to service delivery



# WHY SHOULD WE INVEST IN ECOLOGICAL INFRASTRUCTURE?

## ECOLOGICAL INFRASTRUCTURE ENHANCES BUILT INFRASTRUCTURE

Strategic investment in ecological infrastructure lengthens the life of existing built infrastructure and can reduce the need for additional built infrastructure – often with significant cost savings.

The Mount Fletcher Dam in the Eastern Cape, for instance, was completed just four years ago but has already lost 70% of its water holding capacity as silt from the catchment has ended up in the dam. Why all the unexpected silt? Overgrazing in the mountain grasslands, poor planning, construction and maintenance of roads has damaged wetland and river ecosystems that flow into the dam, causing severe topsoil erosion and the formation of huge erosion gullies.

The good news is that restoration of wetlands and improved management of grasslands in the catchment will directly support the functioning of the Mount Fletcher Dam and increase its lifespan.



Degraded ecological infrastructure leads to reduced capacity and lifespan of dams, and increased maintenance costs

Ecological infrastructure such as intact rivers, wetlands and natural vegetation enhances investment in hard infrastructure

Degraded ecological infrastructure leads to reduced capacity and lifespan of dams, increasing the cost of their maintenance. It also increases the risk of flooding. The result is damage to infrastructure such as roads and bridges, which may even be washed away. All of this poses a significant risk to people. It is usually more cost effective to restore the ecosystems concerned than to keep repairing or replacing the built infrastructure. Investing in ecological infrastructure enhances investments in built infrastructure.

## ECOLOGICAL INFRASTRUCTURE SUPPORTS RURAL DEVELOPMENT

Key elements of ecological infrastructure are located in rural areas – catchments, corridors or tracts of natural vegetation. Restoring and maintaining ecological infrastructure contributes to diversifying rural livelihood options, on the one hand through direct job creation, and on the other hand by strengthening economic sectors such as sustainable farming and ecotourism.



Rural communities often rely directly on ecological infrastructure for goods and services, for example getting their drinking water directly from rivers, and tend to be most severely affected by declines in the quality of ecological infrastructure.

### ECOLOGICAL INFRASTRUCTURE HELPS US COPE WITH CLIMATE CHANGE

Well managed ecological infrastructure can buffer human settlements and built infrastructure against the extreme events that are likely with climate change, playing a crucial and cost effective role in disaster risk reduction. For example, coastal ecosystems such as dunes, mangroves and kelp beds reduce the impact of storm surges on coastal settlements. In contrast, hardening of the coastline puts people and property at greater risk.

Healthy riparian zones and wetlands help to reduce the impact of floods and droughts. In the western part of the country, where it will become hotter and drier, they will help to curb excessive loss of water through evaporation. In the eastern part of the country, where it will become hotter and wetter, they will help to slow down flood waters. In both cases ecological infrastructure can contribute to water security, and thus to food security. Intact ecosystems also absorb and store carbon, to varying degrees.

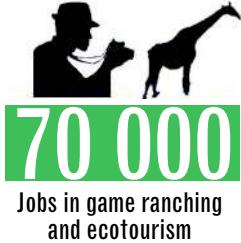
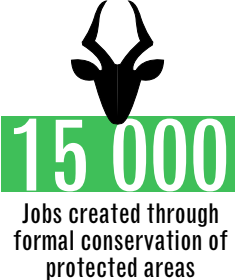
### ECOLOGICAL INFRASTRUCTURE CREATES JOBS

Healthy ecological infrastructure supports a range of economic sectors, directly and indirectly. Restoring and maintaining ecological infrastructure creates jobs – it's usually a labour intensive endeavour. We have only scratched the surface of this job creation potential. Many of the jobs would be in the poorest parts of the country with the least access to other employment opportunities.

The Green Jobs Report by the Industrial Development Corporation & DBSA (2011) highlights that the bulk of the jobs related to the green economy are likely to come from natural resource management – many more than from, for example, renewable energy generation or technologies for reducing emissions.



A green economy is one that results in improved human well-being & social equity, while significantly reducing environmental risks & ecological scarcities



## WHAT'S NEEDED NOW?



Investing in ecological infrastructure is a low-cost high-return development strategy with multiple social, economic and environmental gains

The advantage of ecological infrastructure is that it already exists – we don't have to pay for constructing it. But like all forms of infrastructure, ecological infrastructure needs to be maintained and managed especially when it has been severely degraded and needs to be restored. Key actions to unlock the potential of ecological infrastructure include:

- **Scaling up investments in restoring and maintaining ecological infrastructure**, with a focus on our **highest value ecological assets**. To date our approach has tended to be piecemeal, so we haven't realised the full benefits. The diagram below shows examples of the kinds of interventions required.
- **Building on natural resource management programmes** such as Working for Water and Working for Wetlands. We have models and methods for doing what's required. If we approach investing in ecological infrastructure as a long-term endeavour, the jobs created needn't be short-term contractual employment.
- **Planning and managing our ecological infrastructure networks strategically**, rather than leaving their configuration and persistence to chance. We have excellent science to guide us in exactly this.

