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The Nature Conservancy

The Nature Conservancy (TNC) is a global environmental nonprofit working to create a world where people and nature can thrive. Founded in the U.S. through grassroots action in 1951, TNC has grown to become one of the most effective and wide-reaching environmental organizations in the world. Thanks to more than a million members and the dedicated efforts of a diverse staff and over 1,000 scientists, TNC impacts conservation in 81 countries and territories: 40 by direct conservation impact and 41 through partners.

Nature for Water

Nature for Water (N4W) is a bespoke initiative formed through a partnership between Pegasys and The Nature Conservancy (TNC), launched in 2022. N4W provides world-class program design and implementation support to local actors seeking to establish long-term Nature-based Solutions (NbS) programs that address water security and climate challenges. Through a global interdisciplinary team, N4W diagnoses water security issues, designs NbS programs, and structures operational models that enable sustainable, long-term implementation. To date, N4W has supported 35 NbS programs across 5 continents, including 18 in Africa.

Acknowledgements

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Foreword

Over my four-decade career advancing natural resource management and the economic case for ecological infrastructure in South Africa, I have witnessed the potential and challenges of rehabilitating our catchments to ensure long-term water and livelihood outcomes. The Upper uThukela Water Fund is another significant advancement in developing sustainable financing models for delivering watershed services. This initiative integrates rigorous science, proven implementation models, and a governance strategy to address urgent water security and degradation issues.

This business case reminds us that investment in ecological infrastructure, such as our catchments, rivers, and wetlands, is a necessity, not a luxury. Water security cannot be optimized through grey infrastructure alone. We, the water users, must create an environment that enables nature to function optimally and deliver watershed services that enhance the functioning of grey infrastructure. The benefits highlighted here are not abstract. They directly relate to improved water yield for national inter-basin transfers, reduced sedimentation in strategic infrastructure, enhanced soil moisture and groundwater recharge leading to healthier rangelands, and ultimately increased productive potential of land, enhanced community resilience to the impacts of climate change, meaningful job creation, and an expansion of protected areas within our strategic water source areas. Critically, the analysis confirms that these outcomes are economically viable, with a benefit-cost ratio of 2.3:1 and a net present value of R216 million.

I am encouraged by the collaborative, locally grounded effort behind this work, particularly the contributions of The Nature Conservancy, WILDTRUST, and Nature for Water. This effort demonstrates the potential that emerges when

ecological and technical evidence, community partnerships and beneficiation, and institutional alignment converge with purpose. As someone who has long advocated for aligning ecological restoration with economic development, I believe this Fund offers a replicable model for building South Africa's water resilience while addressing rural livelihoods, unemployment, and land degradation on a large scale.

The Upper uThukela Water Fund builds on over a decade of WILDTRUST's active implementation in the catchment. For water sector policymakers and practitioners, potential partners, and funders, the message is clear: the Water Fund is now poised to increase its impact through a formalized, collaborative mechanism. This is an important step in shifting from individual project delivery to a structured governance and financing model, opening the door for others to support the three key partners in implementing, expanding, and ensuring the long-term sustainability of this important initiative. The Upper uThukela Water Fund not only invites investment in arguably the most economically important "water tower" (strategic water source area/catchment) in Southern Africa but also in a proven approach to resilience, equitable beneficiation, and shared value.

C. Marais

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Project Overview:

The Upper uThukela Water Fund

Upper uThukela Water Fund strategic (UTWF) is initiative designed to enhance water security in the upper uThukela catchment through Nature-based Solutions (NbS). WILDTRUST, in partnership with The Nature Conservancy (TNC) and supported by Nature for Water (N4W), leads this initiative to improve catchment management through multistakeholder governance and funding. Ultimately, the UTWF seeks to address water challenges and environmental degradation caused by climate change and population growth.

This Business Case Summary showcases the outcomes of the feasibility study for the UTWF undertaken by Nature for Water, titled *Upper uThukela Water Fund, South Africa: Feasibility Study Report (WILDTRUST, N4W & TNC. 2025).*

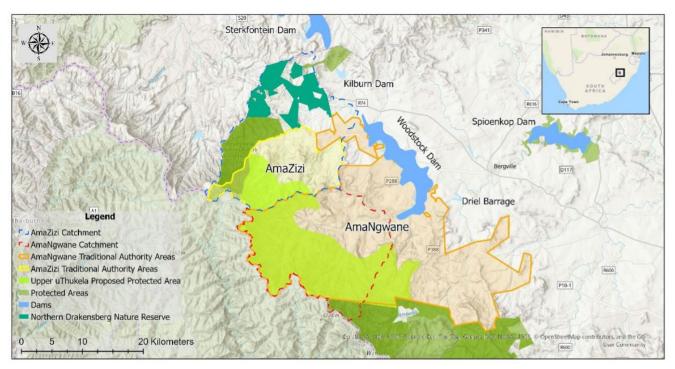
Through scientific modelling, the study assessed and compared multiple scenarios to demonstrate ecosystem benefits from implementing services prioritised NbS for catchment rehabilitation over a 30-year period. Through economic valuation and financial modelling, benefits were measured across the landscape, the rivers, the infrastructure and the communities, with additional far-reaching impacts extending outside of the uThukela River catchment.

Overall, the study found a positive benefit cost ratio (BCR) of 2.3:1, and a net present value (NPV) of R216 million. Additionally, co-benefits are realised for livelihoods through job creation and improved local water and food security, and biodiversity through habitat protection and landscape rehabilitation.



A positive BCR of 2.3:1 means that for every R1 invested, the UTWF could realise an economic benefit value of R2.30 over 30 years – indicating a worthwhile investment. The net present value (NPV) of R216 million means that, after considering all future costs and benefits (adjusted for the time value of money), the project is expected to realise an overall benefit of R216 million in present day terms.

Upper uThukela Water Fund: Locality, Intervention Area and Local Communities





The following infographic indicates key water security challenges faced in the catchment and outlines a long-term, collaborative solution through the UTWF. It showcases prioritised NbS interventions and the long-term benefits they can deliver through sustained implementation.

Why the Upper uThukela Matters



Key Natural Resource
Vital ecosystem services
for the region



Social ImportanceHome to the AmaZizi &
AmaNgwane communities



Water Source
Priority Strategic Water
Source Area & supports
inter-basin transfers



Marine Protected Area

Ecological & Biologically Significant Areas

CHALLENGES



Reduced Water Availability



Decreased Water Quality



Increased Erosion





Poor Land Management



Invasive Alien Plant Spread

Threats to Water Security in the Upper uThukela

The Upper uThukela Water Fund

Providing Nature-based Solutions to drive positive outcomes

Invasive Alien Plant Clearing

Improved Rangeland Management

Protected Area Establishment

BENEFITS



Ecosystem Services

30.4 million m³/yr avoided loss of streamflow

0.94 million t.CO2e seguestered over 30 years

5.15 million m³ avoided loss of storage in Woodstock Dam over 30 years

9 million m³/yr avoided loss of yield to the Tugela-Vaal Transfer Scheme

56% reduced annual average turbidity levels at WTP abstraction points

Financial & Economic

Avoided loss of yield Benefit value: R226 million

Livelihood improvement Benefit value: R54 million

Avoided infrastructure capital replacement cost Benefit value: R30 million

Carbon credits
Benefit value: R62 million

Avoided water treatment costsBenefit value: R8 million

Environmental & Livelihood

Improved livelihoods through creation of 31 full-time jobs on average per year for 30 years, and secondary community benefit through skills development

Improved local water security benefits for those local communities who abstract directly from the rivers (short-value chain)

Environmental co-benefits
Habitat protection and restoration,
enhanced biodiversity, and
reduced carbon emissions

The Water Fund achieves these benefits at a **Benefit-Cost Ratio of 2.3:1** and a positive **Net-Present Value of R216 million**

The Context:

Importance of the Upper uThukela

The uThukela River catchment spans 2.91 million hectares in KwaZulu-Natal, South Africa. With its headwaters in the Northern Drakensberg Strategic Water Source Area, this catchment plays a vital role in the country's water security.

The river supports multiple interbasin transfers, including the Tugela-Vaal Transfer Scheme (T-VTS) to the Integrated Vaal River System (IVRS) and the Eskom Drakensberg Hydropower Pumped Storage Scheme, the uThukela-Mhlatuze Transfer Scheme and the Lower uThukela Bulk Water Supply Scheme. The catchment provides essential ecosystem services such as water provision and retention. sediment control. carbon sequestration, and nature-based tourism.

However, unsustainable land management practices, the spread of invasive species (primarily black wattle), and erosion threaten the integrity of these services. Climate change and population growth will further exacerbate these threats, necessitating the urgent need for intervention.

The upper catchment is also home to the traditional authorities of the AmaZizi and AmaNgwane and their communities, who rely on its natural resources for their livelihoods and survival.

Inter-basin transfers are:

"...the transfer of water from one geographically distinct river catchment or basin to another, or from one river reach to another." - (Davies et al., 1992)







Strategic Water Source Area

Interbasin Transfer Schemes

- Northern Drakensberg Priority Strategic Water Source Area
- Tugela-Vaal Transfer Scheme
 (supplying the Vaal System & the Eskom Pumped Storage Scheme)
- uThukela-Mhlathuze Transfer Scheme
- Lower uThukela Bulk Water Supply Scheme



Key Natural Resource

Ecosystem Services

- Provisioning Services
 (freshwater supply, food sources, livestock products, wood products)
- Regulating Services
 (flow regulation, sediment retention, carbon sequestration)
- Cultural Services
 (spiritual & religious, education, recreational & nature-based tourism)
- Supporting Services
 (nutrient cycling, soil formation & retention, primary production)



Social Considerations

AmaZizi & AmaNgwane

- Traditional Authorities
- Opportunity to improve understanding and awareness within the communities of the ecological and cultural value of the area
- Reliance on **natural resources** (on a short-value chain)
- Opportunity to narrow the gap between community and private landowners



uThukela Protected Marine Area

Ecological & Biologically Significant Areas (EBSA)

Supports the Marine Protected Area at uThukela River Mouth

The Challenge:

Threats to Water Security in the Upper uThukela

Water security in the upper uThukela is under threat due to catchment degradation, driven by Invasive Alien Plant (IAP) encroachment and poor land management practices.

The uncontrolled spread of IAPs reduces streamflow, accelerates soil erosion and diminishes grassland productivity. Whilst land management practices including grazing regimes are driving rangeland and landscape degradation, increasing erosion and decreasing water quality in the rivers.

This dual threat (affecting both quantity and quality) on water security impacts, amongst others:

- Local communities (who abstract water for themselves and their livestock directly from the rivers and streams);
- Downstream water utilities and bulk water infrastructure; and

 Agricultural and tourism sectors, and environmentally sensitive areas.

Hydrological modelling of upstream catchments which traverse the AmaZizi (quaternary catchments V11A of V11C) and portion AmaNgwane (quaternary catchments V11B portion of V11E) communities shows that, without intervention, the average annual streamflow discharged into Woodstock Dam will decline significantly over time.

Additionally, sediment levels will rise, increasing river turbidity and the amount of sediment trapped within the Woodstock Dam, which is expected to retain 96.5% of incoming sediment. These outcomes will decrease water availability, drive up water treatment and infrastructure maintenance costs, and have negative environmental impacts.

DRIVERS





CHALLENGES







The Solution:

The Upper uThukela Water Fund

The UTWF brings together collaborative and science-based solutions to address these issues. By integrating conservation efforts with sustainable financing mechanisms, the Water Fund seeks to:

- Deploy targeted NbS for catchment rehabilitation, identified through scientific analysis and implemented through tested approaches developed from experience in the landscape;
- Ensure long-term funding for conservation initiatives:
- Develop multi-stakeholder governance structures to lead effective implementation; and
- Foster buy-in and collective action among landowners and community members around a shared catchment vision.

The objectives of the Water Fund are aligned with national water policies to enhance resilience to climate change. Its governance structure is designed to ensure effective implementation in partnership with key strategic stakeholders, while also fostering collaboration with local communities and ongoing initiatives within the catchment.

Additionally, the Fund aims to promote a more consistent approach to financing rehabilitation and conservation efforts in the upper uThukela.

This will be achieved by fostering collaboration among stakeholders. providing a central point for planning, coordinating implementation, managing funding flows. Strong governance structures will support collective action, and transparent reporting will demonstrate the value of outcomes delivered to both funders and local communities.

Collective Action for Water Security



The Plan:

Prioritised NbS Interventions

Building on the work historically undertaken in the catchment, and with a focus on addressing identified key water security and livelihood challenges, the UTWF prioritizes three primary interventions:



Invasive Alien Plant Management

522 condensed hectares (ha) removed, and woodlots maintained

Removal of invasive species across an area of 522 condensed ha, to assist in the rehabilitation of natural vegetation and improve the future streamflow.

"Condensed hectares"

Are a way to measure invasive plant infestations by converting partially infested areas into an equivalent size of full infestation, making it easier to map and plan.



Rangeland Management

45 000 ha under rangeland best management practices

Implementing rotational grazing and fire management strategies through the Herding for Health (H4H) model across an area of 45 000 ha, to enhance soil health and livestock productivity, to improve the livelihoods of the AmaZizi and AmaNgwane communities, and to improve soil organic carbon levels.



Protected Area Establishment

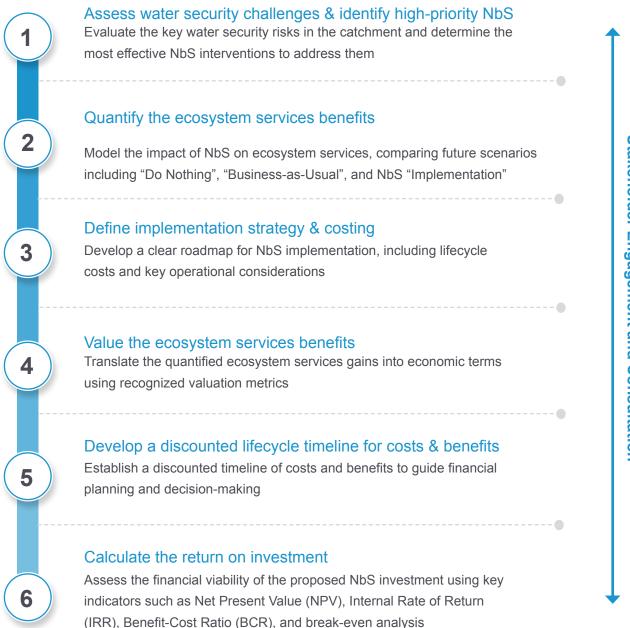
32 500 ha community led PA

Collaborating
with the AmaZizi
and AmaNgwane
communities to designate
a 32 500 ha communitymanaged protected
area, ensuring longterm conservation and
sustainable land use.

The Justification: Building a Case for NbS

Investing in NbS offers a sustainable and cost-effective approach to enhancing water security while delivering long-term environmental and economic benefits. The case for the development of the UTWF and the implementation of NbS in the upper uThukela is founded on robust scientific and economic analyses to answer the question: Why should we invest in NbS through the UTWF? The below infographic illustrates the integrated process that was followed in addressing the question.

Process Followed for Measuring the Feasibility of the Upper uThukela Water Fund

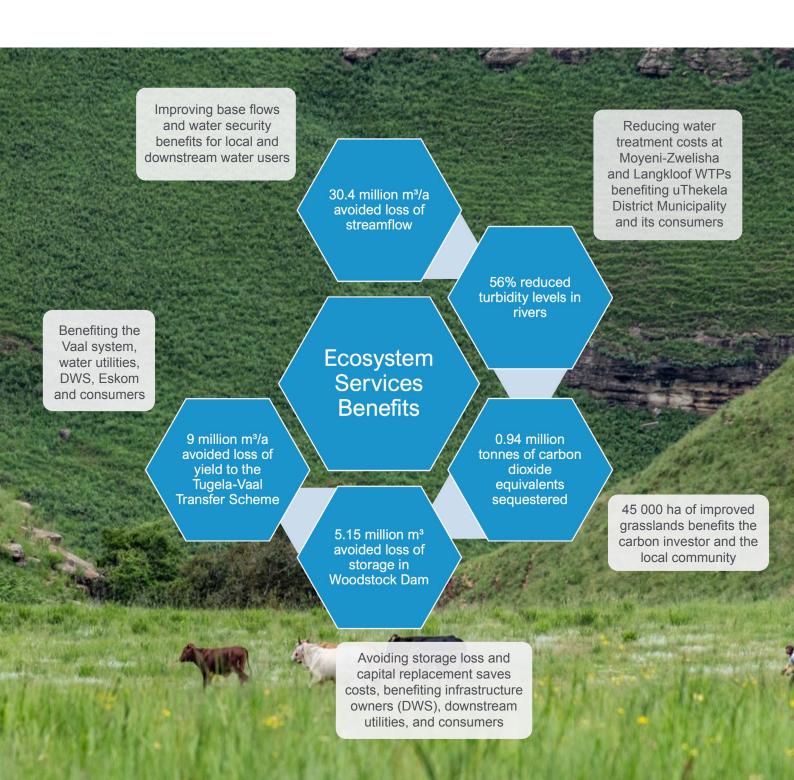


Ecosystem Service Benefits

Ecosystem benefits were quantified using suitable and widely accepted scientific methods. This included the use of biophysical modelling tools including ACRU – for streamflow modelling, SWAT – for sediment modelling, and WRYM – for yield modelling. The graphic below summarises the potential ecosystem services benefits

that could be realised through the implementation of the prioritised NbS interventions in the upper catchment.

Economic analyses to answer the question: Why should we invest in NbS through the UTWF?



Environmental and Livelihood Benefits

Outside of the ecosystem services benefits, the UTWF enables additional benefits to those living in the upper catchment, the AmaZizi and AmaNgwane communities. The Herding for Health model improves the health of cattle, provides better access to auctions and supports cost reduction for those selling cattle. Additionally, those living in the catchment benefit from an im-

provement in water security – both in the quality of the water and its sustained availability (particularly in the dry-season). Furthermore, job creation opportunities arise for local community members through the clearing of IAPs, contributing to both environmental and livelihood benefits.



Improved Livelihoods

Community benefits from job creation (IAP programme and eco monitors), increased cattle sales in number and value, skills development and increased tourism potential



Environmental Co-Benefits

Habitat protection and restoration, enhanced biodiversity, and reduced carbon emissions



Improved Local Water Security Benefits

Water security benefits for those local communities who abstract directly from the rivers (short-value chain)

Implementation Strategy and Costs

WILDTRUST will lead the implementation of the UTWF, leveraging their experience in the catchment and their established relationships with the AmaZizi and AmaNgwane communities.

The implementation costs, estimated over a 30-year implementation period and then discounted to present day values, can be divided into two categories: Programmatic Costs – which include the direct implementation costs of the NbS interventions, and Non-Programmatic Costs – which include the indirect costs of administration, human resources and other overheads.

These also include costs required to effectively monitor and evaluate NbS implementation.

Programmatic Cost Components



IAP Clearing

(High Impact & Maintenance Phases)

- Initial clearing of 522 ha over Year 1 and 2
- Woodlot & IAP maintenance done annually

Cost: R56 million



Rangeland Management

 An additional 45 000 ha of rangeland placed under management

Cost: R52 million



Protected Area

- Capital establishment of Protected Area over Year 1 & 2
- Annual maintenance and management

Cost: R18 million

Non-Programmatic Cost Components



Monitoring, Evaluation & Learning

- Establishment of the MEL programme
- Annual implementation of the MEL activities

Cost: R13 million



Admin & Overheads

 Management and overhead non-programmatic costs incurred annually

Cost: R25 million

Financial and Economic Benefits

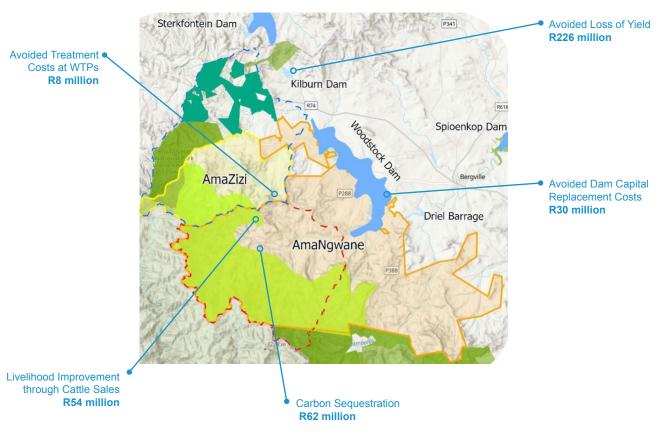
Stakeholders in the catchment also stand to realise economic benefits from the UTWF's solutions, these benefits have been calculated over a 30 year life-cycle and discounted to present day values.

They include:

- Avoided loss of water yield supplied to the T-VTS to the value of R226 million.
- Moyeni-Zwelisha WTP and the Langkloof WTP reduce their treatment costs by R8 million due to the better quality water coming from the catchment.
- Value accrued to the community for carbon sequestration are through the sale of carbon credits on the voluntary market and based on the proportions of the credits owned by the community.

Over time (through the Meat Naturally programme), the community owned portion increases until the community own 100% of the credits generated.

- Livelihood improvement benefits generated through the improved selling price and reduced expenses of selling healthier cattle at local auctions.
- Lastly, the benefit gained from the avoided cost of lost dam storage, due to the sedimentation of Woodstock Dam, is based on the estimated cost to replace the storage which could be avoided through the implementation of the NbS suite.

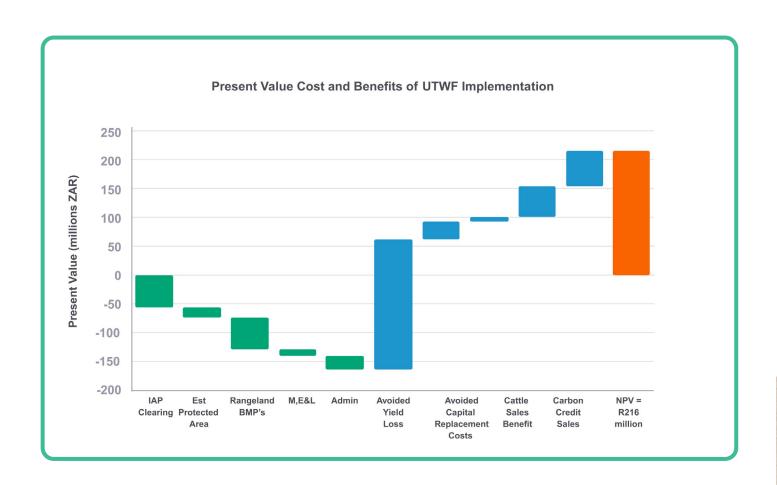


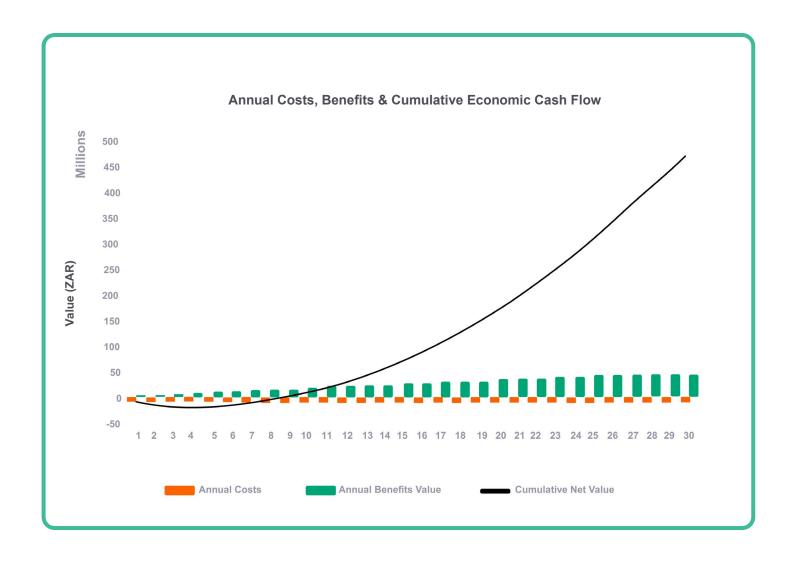
The UTWF delivers a positive return on investment as the value of benefits outweighs the costs.

The graph below summarises the financial and economic analysis conducted over a 30 year period and demonstrates that the UTWF will deliver a positive benefit-cost ratio of 2.3:1, with a net present value benefit (NPV) of R216 million.

Assessing the feasibility of the UTWF has shown that by investing R164 million over 30 years in a prioritised NbS portfolio in the upper uThukela Catchment, it is possible to unlock R380 million worth of benefits (present day discounted values).

The required investment is inclusive of both the programmatic and non-programmatic costs to implement the described NbS suite of interventions. The graphic overleaf (Annual Costs, Benefits & Cumulative Economic Cash Flow) indicates the annual costs required for implementation, the economic benefits achieved, and the cumulative economic cash flow (not discounted) — indicating the cumulative economic benefits outweigh costs after 9 years.









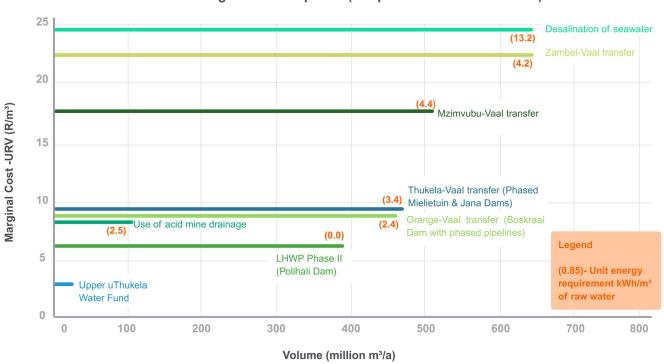
Additionally, a Unit Reference Value (URV) of R2.7/m³ was calculated for the avoided loss of yield to the Tugela-Vaal Transfer Scheme as a result of implementing the priority suite of NbS. This value compares favourably to the alternative augmentation options available to the Integrated Vaal River System – as displayed in the graphic below.

The graphic below, from *The Assessment of the Ultimate Potential and Future Marginal Cost of Water in South Africa* - Figure 3.1 (Department of Water Affairs, 2010), was adapted to include the estimated URV and water volumes achievable through the UTWF.

Unit Reference Value (URV)
A cost-effectiveness measure used
to assess the economic efficiency
of proposed water projects,
particularly in the pre-planning
stage. A lower URV indicates a more
economically efficient project.



Vaal River Augmentation Options (Adapted to Include the UTWF)



The Way:

Approach to Moving Forward

The successful implementation of the UTWF will require continued collaboration, funding, and adaptive management. Key next steps include:

- Governance & Institutional Development
 Strengthening partnerships with local communities, government agencies, and private sector stakeholders.
- Funding Mobilisation
 Expanding investment in conservation finance mechanisms, including carbon credit markets and sustainable land-use incentives.
- Implementation & Monitoring
 Establishing a robust Monitoring, Evaluation, and Learning (MEL) framework to track progress and ensure long-term sustainability.

Implementation Activites & Modality

Water Fund Establishment & Management



IAP Clearing

Implementation is committed through partnerships with TNC and WWF and part-funded for 2025. Engagement with AmaNgwane and AmaZizi is ongoing.



Effective Governance

Develop and formalise the governance of the UTWF. Technical and institutional capacity, system for stakeholder mobilisation and engagement, prioritisation/plan for NbS implementation.



Rangeland Management

Support, technical capacity, access to mobile auctions & carbon market committed from Meat Naturally.



Monitoring, Evaluation & Learning

Design of MEL framework, development of citizen science programme, effective information management system (monitoring assessment, data storage and dissemination).



Protected Area Establishment

Proclamation is being addressed by WILDTRUST, financial support from WWF Nedbank Green Trust, & working with Conservation authority, Ezemvelo KZNWildlife.



Fund Design

Identification and design of appropriate financial structures to support the objectives and governance structures of the Fund. Development of a Fund operations manual.

Conclusions & Recommendations

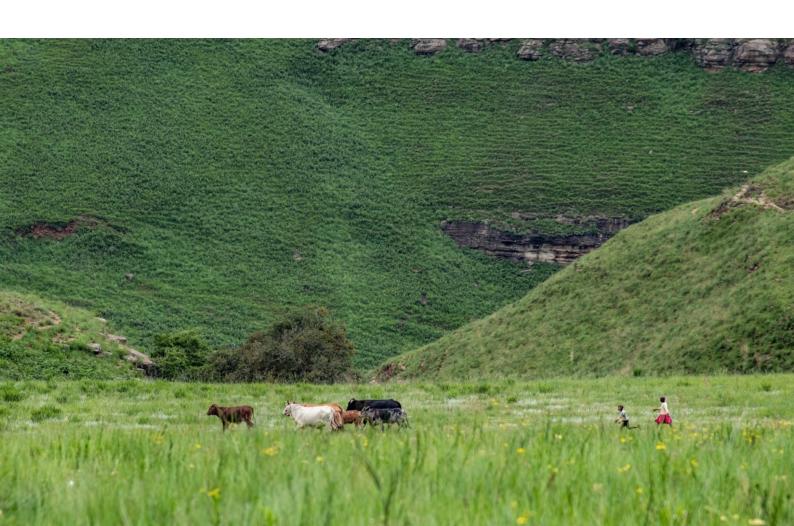
Through securing multi-stakeholder engagement and implementing scalable NbS, the UTWF presents a viable and cost-effective solution to enhancing water security and ecological resilience in the upper uThukela catchment.

Investing R164 million over 30 years in a prioritised Nature-based Solutions (NbS) portfolio in the Upper Thukela Catchment unlocks R380 million in benefits (discounted to present day values).

Key gains include securing 9 million m³ of water annually, reducing water treatment costs, avoiding infrastructure replacement costs, increasing cattle sale revenues, and generating R62 million for local communities from carbon credits. With a benefit-cost ratio of 2.3:1, an NPV of R216

million, and the cumulative economic benefits outweighing costs after 9 years.

Beyond financial and economic returns, investment in the UTWF fosters job creation, habitat restoration, biodiversity protection, and improved livelihoods, making it a compelling investment for sustainable water security and resilience.



Feasibility Component	Outcomes and Recommendations from the UTWF Feasibility Study
Stakeholder Analysis	The Upper Thukela River catchment is critical to multiple water users, locally (upper catchment), downstream, and outside the river basin via multiple transfer schemes.
	Strong willingness from the AmaZizi and AmaNgwane traditional authorities to partner with WILDTRUST.
	Buy-in from private sector actors (e.g. in Gauteng) to action NbS activities.
	Existing forums (e.g. Northern Drakensberg Collaborative) offer complimentary platforms for coordination.
Nbs Interventions	Priority NbS activities to address water security challenges:
	i. IAP removal ii. Rangeland management iii. Protected Area establishment
Scientific Outcomes	30.4 million m³/a average streamflow loss avoided.
	 56% annual average turbidity level reduction at WTP river abstraction points.
	45 000 ha rangeland condition improvement.
	 5.15 million m³ storage loss avoided in Woodstock Dam over 30 years.
	 9 million m³/a avoided loss of yield for Tugela-Vaal Transfer Scheme (at a 1:100 year assurance of supply), and a URV of
Economic Outcomes	NPV of R216 million and a BCR of 2.3:1. Benefits include:
	i.Reduced water treatment and infrastructure costs ii.Livelihood gains from healthier livestock and access to local auctions iii.Carbon credit revenue for the community (community ownership) iv.Avoided water yield loss valued at raw water tariffs
Additional (non-monetised) Benefits	Job creation and skills development.
	Local economic upliftment and eco-tourism potential.
	Improved dry-season flows, including local and downstream users.
	Water quality improvements.
	Biodiversity gains, including improved grasslands, reduced IAPs, and establishing a protected area.
Implementation and Pilot Funding	WILDTRUST leads implementation with TNC support.
	Funding secured for IAP removal, initial rangeland management measures and proclamation of the Protected Area.
	Meat Naturally provide support for grazing models, mobile cattle auctions, and carbon markets.
	Delivery model and governance structure in place, ready to scale through a formal Water Fund mechanism.







