



Financing Nature for Water Security

A HOW-TO GUIDE TO DEVELOP
WATERSHED INVESTMENT PROGRAMS

Acknowledgments

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Contents

Key Terms and Definitions	2
1.0 How to Use this Guide	4
1.1 Why This Guide is Important	5
1.2 Purpose & Structure of the Guide	6
1.3 Key Audiences	8
1.4 Deep Dives: An Overview	9
2.0 Water Security and the Role of WIPs	10
2.1 Water Security: A Global Challenge and Opportunity	11
2.2 The Watershed Investment Program Development Lifecycle	13
2.3 WIPs in Action	16
2.4 Establishing SMART Objectives	20
Case Study Introduction: The Greater Cape Town Water Fund	21
3.0 Partnerships, Sponsors and Champions	22
3.1 The Importance of Partnerships	23
3.2 Stakeholder Engagement Milestones by Phase	24
3.3 The Roles of Sponsor and Champions	25
4.0 Pre-Feasibility	28
4.1 Analytical Workstreams	32
4.2 Understanding & Planning for Impact	38
The Greater Cape Town Water Fund	40
5.0 Feasibility	44
5.1 Analytical Workstreams	48
5.2 Understanding & Planning for Impact	53
The Greater Cape Town Water Fund	54
6.0 Design	56
6.1 Analytical Workstreams	60
6.2 Understanding & Planning for Impact	63
The Greater Cape Town Water Fund	64
7.0 Execution	66
7.1 Importance of Adaptive Management	69
7.2 Program Maturity: Ensuring Lasting Program Impact	70
7.3 Links to Additional Resources	72
The Greater Cape Town Water Fund	73



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Key Terms and Definitions

CHAMPION → A well-connected local individual with significant understanding of water management and is motivated to advocate for the Watershed Investment Program (WIP) and its cause. They are a driving force, cheerleader, and spokesperson for the WIP; moreover, they typically possess political and institutional gravitas enabling them to be an effective advocate.

DEEP DIVE → The Deep Dives are resources which provide in-depth guidance on key technical processes and considerations and can be used in conjunction with this guide as additional resources to assist in the development of your WIP.

DESIGN PHASE → The Design Phase of the WIP development lifecycle follows Feasibility Phase, and establishes the WIP's financial, operational and governance profile with the aim of executing against its SMART Objectives.

EXECUTION PHASE → The Execution Phase is the final phase of WIP development and culminates in WIP operationalization and implementation.

GREY INFRASTRUCTURE → Grey infrastructure incorporates built structures and mechanical equipment, such as reservoirs, embankments, pipes, pumps, water treatment plants, and canals. These engineered solutions are embedded within watersheds or coastal ecosystems whose hydrological and environmental attributes profoundly affect the performance of the grey infrastructure (Browder et al 2019)

FEASIBILITY PHASE → The Feasibility Phase is the second phase of the WIP development process. This phase builds upon, tests, and validates the indicative Theory of Change proposed at the conclusion of Pre-Feasibility. Specifically, Feasibility aims to test whether a specific viable NBS portfolio exists that can achieve impact and attract resource commitments from your stakeholder group.

NATURE-BASED SOLUTIONS (NbS) → Actions to protect, sustainably manage and restore natural or modified ecosystems, which address societal challenges (e.g., climate change, food and water security or natural disasters) effectively and adaptively, while simultaneously providing human well-being and biodiversity benefits (Cohen-Shacham et al 2016).

NbS INVESTMENT PORTFOLIO → A defined implementation scenario that details a total level of effort (e.g., # of hectares wetlands restored) delivered in a defined service area across one or more types of NbS. The NbS Investment Portfolio is evaluated during Feasibility Phase to estimate the potential water security benefits and full-lifecycle costs associated with the scenario, as well as usually an estimated Return on Investment to target program beneficiaries.

NATURE-BASED SOLUTIONS FOR WATER SECURITY (NbS-WS) → Actions to protect, sustainably manage and restore natural or modified ecosystems that address water security challenges effectively and adaptively, while simultaneously providing human wellbeing and biodiversity benefits.

PRE-FEASIBILITY PHASE → The Pre-Feasibility Phase is the first phase of the WIP development process, which requires negotiating a set of key questions aimed at addressing the high-level potential for NbS to contribute to water security outcomes. Pre-Feasibility culminates with a go/no-go decision to move to Feasibility Phase per the guidance and support of your stakeholder group.

SPONSOR → A Sponsor is the institution (and the associated individuals within that institution) that kicks-off the WIP development process and is the principal leading force for organizing resources and stakeholder engagement through the end of Design Phase. The Sponsor is often an existing local counterparty with significant watershed influence, such as a local water utility or basin authority. This party may or may not continue to lead the WIP during Execution Phase.

WATER FUND → Water Funds are organizations that design and enhance financial and governance mechanisms which unite public, private and civil society stakeholders around a common goal to contribute to water security through nature-based solutions and sustainable watershed management. They may be especially relevant and useful when no other legally pre-defined watershed management arrangement exists.

WATERSHED INVESTMENT PROGRAMS (WIPs) → An initiative designed to deliver ecosystem services (e.g., filtration, flood control, etc.) by investing in the protection or restoration of nature. WIPs aim to deliver water security and associated co-benefit outcomes via a defined portfolio of NbS interventions within a specified service area (the “NbS Investment Portfolio”).

WATER RESILIENCE → Resilience is the ability of a water system, by its design and operation, to maintain its function and service provision under stresses and shocks (persistence), to adjust its configuration or operation in order to sustain its function under change (adaptability), or to establish a new function or “new normal” when the prior function cannot be maintained (transformability). (CEO Water Mandate Resilience Assessment Framework).

WATER SECURITY → Availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies (Grey and Sadoff, 2007).



THIS CHAPTER OUTLINES

- Purpose of this Guide
- Key Audiences
- How the Guide is Structured and How to Use it

1.0

How to Use this Guide

1.1 Why This Guide Is Important

The accelerating climate change and global water crisis is a planet-sized problem that demands water users and operators to invest in solutions that can achieve multiple objectives. In many cases, this includes the system-scale integration of nature-based solutions (NbS), which are actions to protect, sustainably manage and restore natural or modified ecosystems, to address societal challenges (e.g., climate change, food and water security or natural disasters) effectively and adaptively, while simultaneously providing human well-being and biodiversity benefits (Cohen-Shacham et al. 2016).

Where advantageous, the water sector should re-orient funding and financing to NbS such as forest management, reforestation, regenerative agricultural and ranching practices, wetland and floodplain restoration, and invasive plant management. Failure to conserve natural assets and their ecosystem services today only increases the risks to water security and the cost of restoration in the future (Water Research Foundation, 2020).

This Guide collates decades of experience to codify the process by which TNC and partners have developed watershed conservation and watershed investment programs all over the world. This document will be further updated, iterated upon, and refined over time as more watershed investment programs are implemented and deliver results.

Relationship of the How-to Guide to TNC's Resilient Watersheds Strategy and 'Financing Nature for Water Security' Partnership with AFD

This How-to Guide and associated Deep Dives were developed by TNC's Resilient Watersheds Strategy, which has been working with partners for over 20 years to establish strong place-based watershed investment programs that promote meaningful water security and biodiversity outcomes. The strategy aims to reach scale by:

- Demonstrating a diversity of NbS in partnership with local communities that effectively address local challenges associated with water, including mitigating flooding, improving water quality and dry season availability, living with wildfires, and improving market access for farmers and ranchers.
- Equipping partners with the training, tools, and technical support they need to succeed in designing and operating their own watershed investment programs.
- Increasing investments in NbS while removing barriers for their adoption by partnering with corporations, banks, regulators, and policymakers to unlock critical funding for NbS and to pass policy reforms that create enabling conditions for meaningful and equitable watershed investments.

1.2 Purpose & Structure of the Guide

The How-to Guide (HTG) for Watershed Investment Programs serves as a succinct and practical resource for those seeking to improve their water security via Nature-based Solutions (NbS) in a programmatic manner. The HTG assists readers in understanding how to design, implement, and finance NbS investment programs that drive long-term water security outcomes.

A Watershed Investment Program (WIP) is an initiative designed to deliver ecosystem services (e.g., filtration, flood control, etc.) by investing in the protection or restoration of nature. WIPs aims to deliver water security and associated co-benefit outcomes via a defined portfolio of NbS interventions within a specified service area (the “NbS Investment Portfolio”). A WIP is a programmatic approach for delivering Watershed Investments, which are defined as transactions between a service provider and payer or beneficiary where financial or economic value is exchanged for activities or outcomes associated with the maintenance, restoration, or enhancement of natural areas considered important for watershed services (Forest Trends 2016).

The Guide is built upon a large body of expertise and embeds real-world case studies to help readers navigate the process of developing a Watershed Investment Program. It does not recommend a set of specific interventions or financing mechanisms. Rather, it outlines a development process for the reader to design and operate a watershed investment program to address their specific water security challenge.

For ease of use, the Guide presents the process in a sequential manner, though in reality the WIP development processes are not always clear-cut or neatly sequential. Phases and activities build on information gleaned throughout the process in an iterative manner. As such, we suggest reading the entirety of the Guide before beginning to better understand the type of information needed and how to use it.

The Guide moves the reader through each phase of the Watershed Investment Program development lifecycle (Figure 1), with the aim of understanding:

- The purpose of each phase,
- Questions that should be addressed by phase conclusion,
- Activities and outputs useful in answering these questions, and
- Key transition milestones that are foundational before moving on to the next phase in the program development lifecycle.

Each phase begins with a schematic outlining a high-level sketch of the phase objective, workstream activities, and connection to long-term impact generation (Figure 2). Each workstream is described in detailed, with links as appropriate to a series of ‘Deep Dives’ (Section 1.3), where readers can access more detail, including tools and links to other useful resources. The workstreams are followed by a section on “Impact” that describes key considerations to ensure that the WIP drives towards validated and verifiable water security outcomes. Lastly, each chapter concludes with a real-world case study from the Greater Cape Town Water Fund (GCTWF), which illustrates the process the team underwent to develop the WIP. The reader follows one case study throughout the document so as to better illustrate how subsequent phases build on one another to create a cohesive program. The Cape Town case study is available in its entirety [here](#).

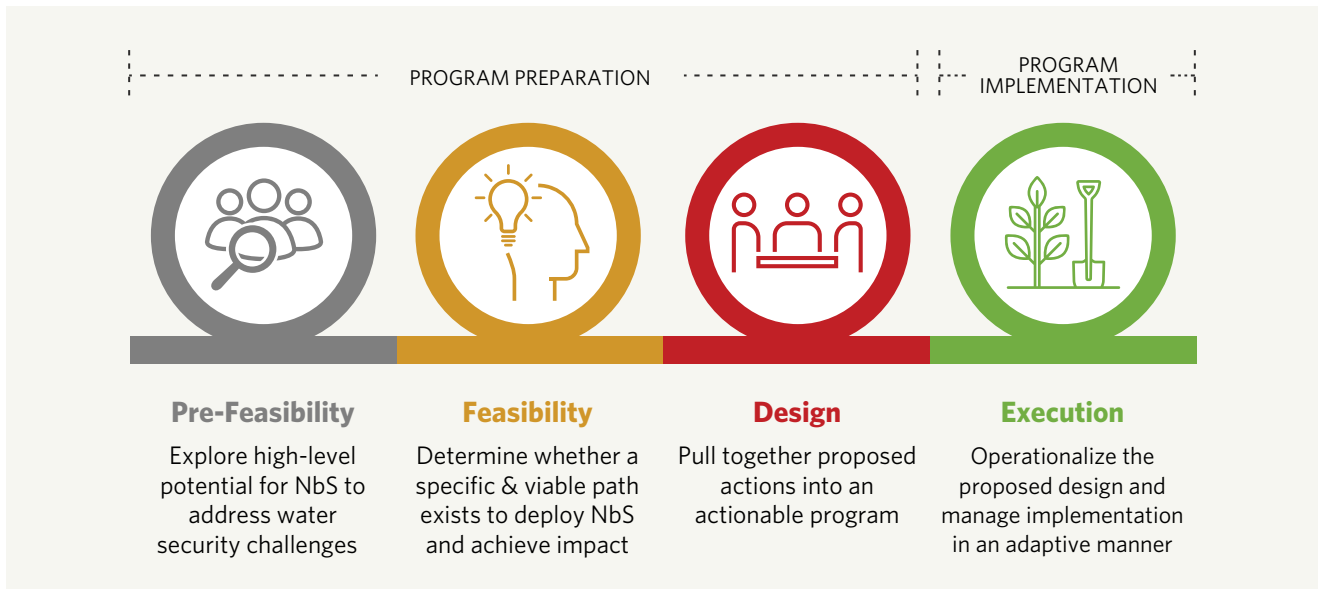


FIGURE 1. The Watershed Investment Program Development Lifecycle.

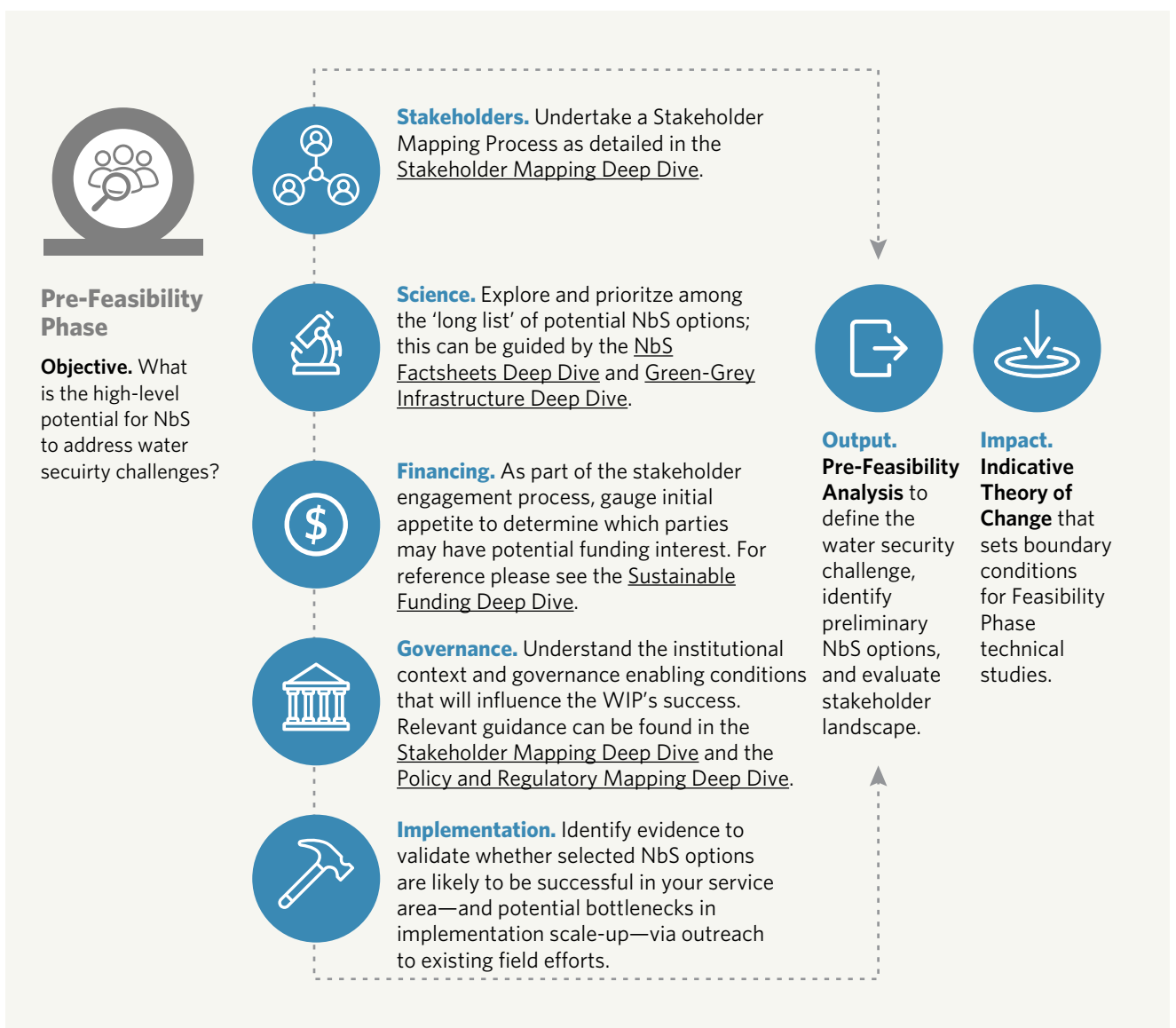





FIGURE 2. Example of schematic introducing each phase of the WIP development cycle.

1.3 Key Audiences

The How-to Guide is designed to meet the needs of practitioners and investors across a variety of sectors who may wish to improve water security by employing nature-based solutions. The Guide has been written with this diversity in mind.

<p>WATER USERS & OPERATORS</p> 	<p>Water and Power Utilities. This guide provides an end-to-end overview of WIPs to support utilities in understanding which NbS are suitable for them, and how to fund and implement these solutions in a sustainable manner.</p> <p>Corporates. This guide outlines how corporate users can support the development of WIPs, usually via funding and collective action, to reduce the water security challenges in their affected area, operations and/or value chains.</p>
<p>CIVIL SOCIETY</p> 	<p>Non-Governmental Organizations (NGOs). The guide outlines how those in the environmental, social impact and WASH spaces can prepare and develop WIPs, either on their own or in partnership with other organizations and mobilise resources for their implementation and sustainability objectives.</p> <p>Indigenous Peoples and Local Communities (IPLCs). The guide details how local communities can influence and help execute WIPs that generate local water security outcomes and co-benefits while also supporting overall watershed health. In many cases, IPLCs often partner with an NGO who can provide the capacities needed to develop the WIP in their vision.</p> <p>Agricultural Associations. The guide outlines how irrigation boards and organized agriculture can improve long-term water security by adopting land management practices and water savings measures to improve food security and resilience.</p> <p>Research Institutions and Academics. This document contextualizes the WIP development process so that parties conducting supporting research efforts can plug in their knowledge and expertise appropriately.</p>
<p>FUNDING & FINANCING INSTITUTIONS</p> 	<p>Development Finance Institutions (DFIs). This guide enables DFIs to understand how they can finance water security projects or programs that include a WIP, either on a stand-alone basis or as part of blended green-grey investment packages.</p> <p>For specific detail on how NbS and WIPs fit into DFI traditional lending cycles, please reference the Sustainable Funding Deep Dive.</p> <p>International Cooperation. Given that WIPs can serve as essential instruments for promoting the international sustainable development agenda, bilateral and multilateral agencies as well as private philanthropists have key roles to play in supporting WIPs. The Guide provides insights for how these parties can maximize their impact both in the program preparation and execution phases.</p>
<p>GOVERNMENT AGENCIES & PARASTATALS</p> 	<p>The guide enables local authorities, government agencies and parastatals such as basin authorities and water user associations to develop WIPs and implement NbS for water security for a city, area, or region.</p>

1.4 Deep Dives: An Overview

Deep Dives offer detailed guidance on key subject matter areas for WIP preparation. They function as additional reference sources to complement this Guide. Colored-in boxes indicate the primary phases emphasized within the respective Deep Dive.

DEEP DIVES	PRE-FEASIBILITY	FEASIBILITY	DESIGN	EXECUTION
<p>Co-benefits and Trade-offs. One of the key advantages of NbS over grey solutions is their potential to deliver on multiple benefits, often called co-benefits. Equally, if not more important, is awareness of the trade-offs that should be taken into account when considering investment in specific NbS. This brief explores types of co-benefits and trade-offs and how to identify, quantify and financially value these potential outcomes of WIPs, local community engagement and communications.</p>				
<p>Economic & Financial Analysis. Detailed, comprehensive methodology required to articulate the economic and/or financial benefits of your watershed investment program.</p>				
<p>Green-Grey Infrastructure. Delivering the most resilient, robust solutions to water security challenges often requires a combination of ‘green’ and ‘grey’ solutions. This technical brief is intended to provide readers with insights into how each type of solution works to address water security challenges within a water management system and explore pathways for integrated planning.</p>				
<p>Governance. Review of common WIP governance models, and aspects to consider when designing the governance, operational and legal structure of your program.</p>				
<p>Monitoring & Evaluation Program Design. Monitoring progress and evaluating the impact of a WIP is critical for reducing uncertainties and adaptively managing the program over time. This brief introduces some key principles in monitoring and evaluation (M&E) program design and directs readers to resources that provide detailed guidance on metric selection, monitoring design and data collections and analysis.</p>				
<p>NbS Option Factsheets. The NbS factsheets aim to provide an initial overview of key characteristics of twelve selected Nature-based Solutions for Water Security. They are intended to guide prospective funders and financiers of Watershed Investment Programs and other parties in respect to the typical properties of each NbS option including the water security challenges addressed, additional co-benefits, typical cost profiles, and risks.</p>				
<p>Policy and Regulatory Mapping. This Deep Dive outlines the legal and regulatory policy mapping process and provides a list of suggested initial questions readers should be answering and resources that should typically be relied upon in such evaluation.</p>				
<p>Stakeholder Mapping. Establishing a WIP requires engaging with the stakeholders who are responsible for, benefit from, and potentially provide funding towards, watershed stewardship and water management. Mapping these stakeholders and analysing their mandates and priorities needs to be undertaken in the pre-feasibility phase to determine which stakeholders are most essential to WIP advance and the appropriate method to engage them.</p>				
<p>Sustainable Funding. This guidance aims to help WIP sponsors understand the key steps for creating a sustainable funding strategy, with the goal of ensuring that funding commitments meet the full program lifecycle costing needs to meet the program’s technical objectives.</p>				



THIS CHAPTER OUTLINES

- Global Water Security Challenges
- What NbS for Water Security Are
- Green/Grey hybrid infrastructure options
- Brief Examples Showcasing 'WIPs in Action'
- Overview of the WIP Program Development Lifecycle
- Introduction to Greater Cape Town Water Fund Case Study

2.0

Water Security and the Role of WIPs

2.1 Water Security: A Global Challenge and Opportunity

The water we use every day is directly dependent on the landscapes through which it flows. Our watersheds—the lands around rivers, lakes, and streams—are some of the most undervalued natural systems on Earth. Nearly half of all drinking water sources are significantly degraded, threatening the quality and quantity of water reaching our communities and cities (McDonald et al. 2016, Abell et al. 2017). About 4 billion people—nearly two-thirds of the world’s population—already experience severe water scarcity at least one month of the year (Mekonnen and Hoekstra 2016), and pressures on freshwater resources are only expected to increase in the face of climate change, urbanisation, and intensification of agriculture. Indeed, the UN estimates that increased agricultural demand could drive a 42 percent gap in freshwater availability by 2030 (UN Water 2018). The persistent degradation of these watersheds and our freshwater ecosystems has driven an 84 percent decline in freshwater species populations since 1970 (WWF 2020). More than three-fourths of urban source watersheds are within regions of high species diversity and high endemism (Abell et al., 2019).

Restoring the health and resiliency of our watersheds is of urgent concern and achievable. By investing in NbS we can improve water security, restore biodiversity, enhance communities’ resilience to climate change, and promote equitable, inclusive development. Grey and Sadoff (2007) specifically define water security as

The availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems, and production, coupled with an acceptable level of water-related risks to people, environments and economies.

This definition is relied upon throughout the Guide; Figure 3 offers a potential schematic of dimensions against which to evaluate water security.

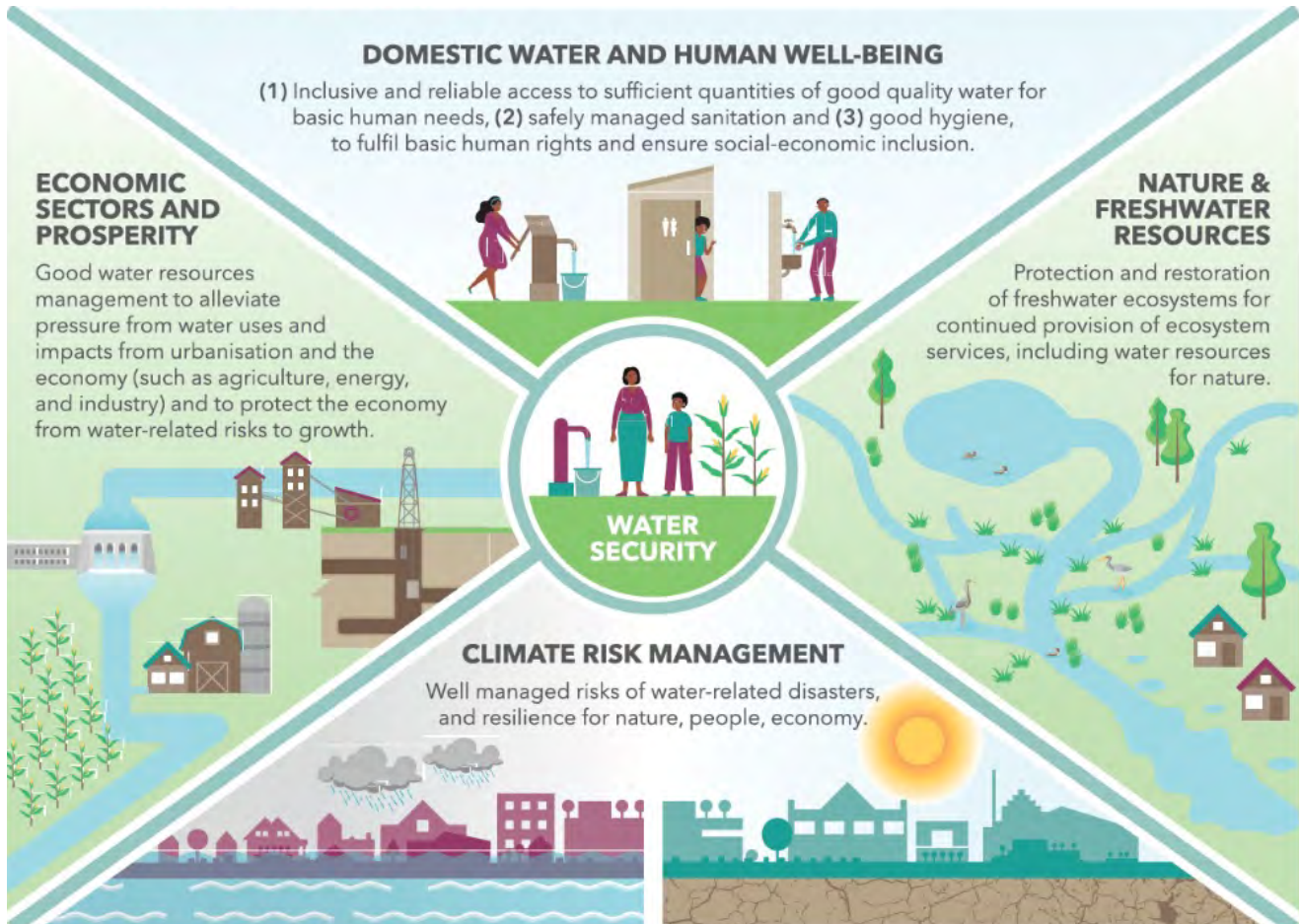


FIGURE 3. Diagram of Water Security (The Resilient Water Accelerator 2021). Societies can enjoy water security when they successfully manage their water resources and services to meet the needs of people and ecosystems over the long-term.

2.1.1 Nbs FOR WATER SECURITY

Increased focus on investments that provide multiple benefits has spurred interest in alternatives to traditional water security approaches, such as grey infrastructure, that fail to take a systems approach (Palmer et al. 2015). In response, the term Nature-based Solutions (NbS) was coined by IUCN to encompass “actions to protect, sustainably use, manage and restore natural or modified ecosystems, which address societal challenges, effectively and adaptively, providing human well-being and biodiversity benefits” (Cohen-Shacham et al., 2016). From the perspective of delivering water security benefits, NbS measures can connect watershed stakeholders including upstream users, land use patterns, and biophysical functions of associated ecosystems. Such Nature-based Solutions for Water Security (NbS-WS), include:

“Actions to protect, sustainably manage and restore natural or modified ecosystems that address water security challenges effectively and adaptively, simultaneously providing human wellbeing and biodiversity benefits.”
(Tremolet et al, 2019)

Figure 9 in section 4.1.2 illustrates the typical water security benefits of different NbS and the potential for co-benefits.

Grey infrastructure remains the dominant type of intervention to improve water security, while NbS-WS are often relegated to small-scale and project-level implementation. There is, however, a growing movement to implement large-scale NbS or hybrid investments (Section 2.1.2) as these solutions are increasingly seen as cost-effective

strategies (Matthews and De La Cruz 2020). Though highly context-dependent, adopting an NbS approach has multiple potential benefits, including:

- **Addressing key water security issues.** Such as surface water quality, groundwater quality, floods, and water scarcity.
- **Addressing a broader set of critical issues.** NbS-WS have shown to have long-lasting effects broader than solely water security outcomes including protecting ecosystems and reversing biodiversity loss, as well as mitigating and adapting to climate change, job creation, food security, human health, and disaster risk reduction (Mishra et al 2021).
- **Resilient design.** Grey water security solutions are vulnerable to variability in the quantity and quality of source water. Furthermore, grey infrastructure can actively lead to environmental degradation and can be energy-hungry in their build and implementation. Investments and NbS-WS can improve the resiliency of existing built infrastructure in the face of watershed land use change and climate impacts.
- **Cost-Performance.** Both green and hybrid projects can meet or exceed cost-performance criteria of comparable grey investments while also supporting other agendas, such as quality of life, ecological resilience, and flexibility in the face of climate and economic uncertainty.

2.1.2 HYBRID INVESTMENTS: GREEN-GREY INFRASTRUCTURE

Delivering the most resilient, robust solutions to water security challenges often requires a combination of ‘green’ and ‘grey’ solutions. Both NbS and grey infrastructure can serve to deliver a number of outcomes, including enabling water service providers to supply clean, reliable water to people at least cost and mitigating impacts of extreme climate events such as floods and droughts. Both types of infrastructure can also provide additional benefits to people and nature, although the types of benefits they typically are designed to deliver on differ. For example, NbS often are expected to provide benefits to people and ecosystems and/or biodiversity, while grey infrastructure is usually intended to deliver one or more benefits to people, while seeking to minimize its impacts on the environment.

With much of the focus for water management on grey solutions over the last several hundred years, many societies around the world have allowed ecosystems to be degraded through agricultural expansion, urban development and deforestation, among other drivers, and along with this degradation is a huge loss in the foundational services they provide to source watersheds. Strategically combining green and grey infrastructure to lower costs and improve resiliency can help tackle the looming financial and environmental crisis facing global infrastructure systems. With the right conditions, green infrastructure components can cost-effectively enhance service delivery, while also empowering communities and increasing infrastructure systems’ resilience and flexibility in a changing climate (Browder et al 2019). For more detail on this, please look at the [Green-Grey Infrastructure Deep Dive](#).

2.2 The Watershed Investment Program Development Lifecycle

Water security is a complex, multi-layered, and interconnected societal and environmental issue. To succeed, solutions need to be equally as holistic, well-informed, multi-layered, and adaptive. Key aspects of WIP development include:

- **A thorough multi-stakeholder process** that involves upstream and downstream stakeholders in development and decision-making to garner participation and endorsement, motivate investment, and mitigate conflicting interests.

- **Adaptable and customizable** to diverse contexts and scales, rather than prescriptive.
- **Focused on long-term impact** and an ability to clearly quantify, evaluate, and report outcomes at each stage of the WIP development process.
- **Science-based approach** that relies on information systems to link NbS intervention activities to ecosystem services and overall watershed context.

The WIP process is composed of four interconnected phase—Pre-Feasibility, Feasibility, Design, and Execution—grouped into Program Preparation and Program Implementation (see Figure 1). Each phase has a defined core objective and a set of questions that practitioners should address before moving on to the next phase. Figure 4 below provides an overview of the process, including primary and supporting activities practitioners should undertake to resolve these “core questions”. Suggested principles to keep in mind as you develop your WIP are included in Figure 5.

The HTG groups similar bodies of work into five workstreams throughout each phase. These workstreams are followed by a section on how to understand and plan for long-term impact and quantify outcomes at each stage. The workstreams include:



Figure 4 depicts the four phases of the WIP Program Development Lifecycle.

Each phase has a specific Objective, as well as a set of Key Questions that should be explored and answered during the phase.

Phases are also associated with a set of supporting activities and outputs that help address the Key Questions.





		PROGRAM PREPARATION		PROGRAM IMPLEMENTATION	
					
		Pre-Feasibility	Feasibility	Design	Execution
OBJECTIVE	Understand the water security challenges and explore the high-level potential for NbS to address them	Determine whether a specific viable path exists to deploy NbS and achieve impact	Marry interest and ambition into a cohesive actionable package	Operationalize proposed design and adaptively manage to ensure long-term objectives	
KEY QUESTIONS	<ul style="list-style-type: none"> What is the water security challenge? Which NbS options are most relevant? Which stakeholders care, and why? Is there a favourable institutional and funding context? Can collective action serve to enhance outcomes? 	<ul style="list-style-type: none"> What is the local absorption capacity, social acceptance, and costs and benefits profile for prioritized NbS options? What is the target implementation scenario, and do funders believe it has an attractive benefit/cost profile? Is additional fundamental work required (e.g., technical analysis, stakeholder engagement) to move to WIP design? 	<ul style="list-style-type: none"> What is the institutional vision and concrete technical objectives? What is the governance, funding and operational arrangement to achieve those objectives? 	<ul style="list-style-type: none"> How to maximize operational efficiency and transparency? How can field monitoring be used to validate results? Do core program objectives (e.g., NbS options list) require revision? 	
ACTIVITIES AND OUTPUTS	<ul style="list-style-type: none"> Pre-feasibility package to define water security threat, identify preliminary NbS options, and evaluate stakeholder landscape and culminates with a go/no-go decision; perhaps accompanied by pre-feasibility ROI evaluation Pending Pre-feasibility 'go' evaluation: MOU with key stakeholders (or similar agreement) to conduct and guide Feasibility Phase 	<ul style="list-style-type: none"> Feasibility assessment that includes detailed NbS options evaluation and full-lifecycle program costing, biophysical modelling, and detailed ROI evaluation Pending Feasibility 'go' decision: MOU with key stakeholders (or similar agreement) to execute Design Phase activities 	<ul style="list-style-type: none"> Strategic plan capturing core institutional vision and SMART Objectives, which are aligned with validated financial and governance structure and are calibrated against operational and M&E aspects Secure sustainable funding commitments to deliver against full-lifecycle program costs for Execution Execute pilot interventions (as relevant) to validate NbS portfolio Secure permits for implementation activities (as relevant) 	<p>Start-up:</p> <ul style="list-style-type: none"> Operating manual to define systems and processes Appoint core staff (as relevant) Implementation entity establishment (as relevant) <p>Operation:</p> <ul style="list-style-type: none"> Deliver annual implementation plan addressing financial, implementation, communication & other operational needs Mobilize capacity for implementation Monitoring and evaluation program activation Provide impact reporting Secure additional funding commitments as required for program to meet technical objectives 	

FIGURE 4. Overview of the WIP Program Development Lifecycle including objectives, core questions, primary deliverables and supporting outputs.

Background on the water funds model & relationship to LAWFP's 'Desired State' framework

The water fund model was pioneered in the high Andean grasslands in the late 1990s, when Quito's water utility EPMAPS began exploring with TNC how to partner with other water users and upstream communities to reverse the degradation of their water sources. While the structure of subsequent water funds varies from place to place depending on local conditions, the model innovated in Latin America has since been successfully adapted in a dozen countries from the United States to China to Kenya. Water funds represent a 'collective action' model for WIP development.

In 2011, the Inter-American Development Bank (IDB), FEMSA Foundation, Global Environment Facility (GEF) and TNC created the Latin American Water Funds Partnership (LAWFP) to provide support and resources to water funds in the region. Thanks to the technical assistance and seed funds provided by the Partnership, multiple Water Funds have been created. While many additional cities were inspired, a key challenge was formalizing the co-creation process for establishing water funds. This process was outlined via the 'Desired State', which is now the Partnership's standard for managing water funds in the region and has informed and enriched the WIP development lifecycle outlined in this How-to Guide. For additional details on the Desired State see the [LAWFP website](#).

2.3 WIPs in Action

WIPs can be designed and implemented in many different ways. A WIP can be driven by a variety of sponsor types (e.g., NGOs, government agencies, direct water users, or development financial institutions), and delivered via different types of governance arrangements (e.g., collective action vehicle, hosted program, umbrella agreement). Furthermore, WIPs can also leverage one or multiple investment funding sources. We offer a selection below to show the range and heterogeneity of NbS options, governance models, funding agents, sponsor types, and implementation models found in WIPs across the globe.

Rio Grande Water Fund



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New Mexico, USA → The purpose of the Rio Grande Water Fund (RGWF) is to enhance storage, delivery, and quality of water from the Rio Grande River through **forest management** to avoid wildfire risks and associated sediment loading, flooding, and property loss. Launched in 2014, the RGWF is governed as an **umbrella agreement** with a collaborative charter across 100 entities. While each entity has its own implementation objectives and is responsible for raising the majority of its funds, there is a rotating Executive Committee that is responsible for executing some overarching functions. The executive committee prioritizes investments, conducts M&E, facilitates payments to implementers, and drives a **diverse set of**

funding commitments across multiple organizations including to the USDA Forest Service, local water utilities, private corporations, and philanthropy. It aims to restore 600k acres of the Rio Grande's forested watershed over 20 years. For additional details, see [link](#).

Emscher River Restoration



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Northrhine-Westphalia, Germany → The Emscher River—which flows through the Ruhr Metropolitan area, one of the most densely populated areas in Europe—was once a series of highly modified open wastewater channels. A 1990 €5.3bn blended **package of green and grey infrastructure solutions** including **sewer canals and river restoration** has restored the Emscher to a set of near-natural stream systems. Multiple tranches of funding from **development finance institutions** such as EIB have been issued to Emschergenossenschaft, a public-private water board that implements the loan as a **hosted program** and is responsible for the Emscher catchment and its 2.2 million inhabitants.

Upper Tana-Nairobi Water Fund



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soil runoff. **Blended funding** is provided by multiple partners include multiple corporates, the Global Environment Facility, and in-kind support from local counties.

Nairobi, Kenya → 95 percent of Nairobi's water supply originates in the Tana River, whose source watershed is host to some 300,000 farms that relying on the river for irrigation water. Expanding agricultural activities—including by smallholders into cultivating steeper slopes and riparian catchments—has led to increased abstraction and siltation, impacting downstream water supplies including local communities, the water utility and hydropower operator. In 2015 TNC and partners set up the Upper Tana-Nairobi Water Fund which today is an **independent trust** that enables sustainable practices such as terracing, riparian buffer strips, and agroforestry across some 30,000 farmers to reduce

Pingxiang 'Sponge City'



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Jiangxi, China → Pingxiang municipality faces significant flood risk issues, with five floods occurring between 1998 and 2014 affecting nearly 500,000 people and leading to the collapse of approximately 3,000 homes; the 2014 flood generated \$115 million in estimated economic losses. When considering different options, primary emphasis was placed on providing additional space for the river to allow for natural seasonal water level fluctuations to provide peak flood reduction alongside water quality protection. The resulting **'sponge city' grey-green** integrated river rehabilitation and flood risk infrastructure package—supported by a **\$150 million**

sovereign loan from the Asia Development Bank alongside additional contributions by local, municipal, and county governments—involves floodplain protection, wetlands rehabilitation, detention basins, and green embankment upgrades along 70km of the river, supported by new sewerage piping to free up drainage pipes for exclusive use for rainwater runoff. For additional details, see [link](#).

Edwards Aquifer



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Texas, USA → The Edwards Aquifer provides roughly 70 percent of San Antonio's drinking water. From 2000 to 2015 voters approved a 1/8 cent **sales tax** to fund the Edwards Aquifer Protection Program which has generated USD \$315 million to purchase 160k acres of protected green space to improve infiltration and water quality. The initiative is governed as a **hosted program** by the City of San Antonio and is overseen by the Conservation Advisory Board that includes members from various state and local agencies. For additional details, see [link](#).

Cuenca Verde



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Medellín, Colombia → The Aburrá Valley is home to roughly 4mm people, including the city of Medellín and nine satellite cities. The utility Empresas Públicas de Medellín (EPM) is tasked with water supply management, of which roughly 70 percent is sourced from the Rio Grande reservoir. Facing growing pressures from unsustainable cattle ranching and urbanization-linked deforestation, EPM joined corporations Coca-Cola and Postobón with support from TNC and the IADB to develop the 'Cuenca Verde' water fund, a **dedicated legal vehicle** with the aim of prioritizing and organizing upstream watershed investments including **land protection, forest restoration, and agricultural & ranching best management practices**. For additional details, see [link](#).

Although each WIP is different, the broad principles provided on the following page are useful to keep in mind across all development phases to maximize the likelihood of a successful program.

<p>STAKEHOLDER INTEREST IS KEY THROUGHOUT</p> 	<p>The WIP process requires multiple levels of engagement with a variety of stakeholders. In order to successfully deliver a WIP, you will have to identify, engage and work with and alongside a number of actors to achieve the desired WS goal.</p> <p>The WIP process leverages the benefits of working with actors at all levels and with varying mandates and resources.</p> <p>Understanding the key stakeholders in your context, and then successfully engaging and co-opting them into your process is critical to the delivery of resilient watersheds.</p>
<p>UTILISE TECHNICAL EXPERTISE</p> 	<p>As WIP are multi-dimensional and cross-sectoral in nature, expertise will need to be sought at various points.</p> <p>Its is crucial to identify when certain expertise needs to be accessed, whether this be scientific, technical, legal or procedural.</p> <p>By bringing the correct expertise in at the correct time, it enables you to make informed decisions, identify and mitigate against future risks, and enhance the process for optimal and sustainable real-world outcomes.</p>
<p>TAKE A HOLISTIC APPROACH</p> 	<p>The WIP process outlined in this guide is comprised of several components.</p> <p>In order to understand and identify the ideal program for your context it is crucial to explore each component within a phase before taking action.</p> <p>It is only by understanding all aspects of your context that you are able to select the correct partnerships, interventions, and actions for your program.</p> <p>Focusing solely or too much on one aspect may lead to an action which will not succeed due to other components that were overlooked at key phases.</p>
<p>USE AN ITERATIVE PROCESS AND INCORPORATE LESSONS LEARNT</p> 	<p>The WIP process is cyclical and iterative - rather than linear - in nature, and key learnings from each step can be utilized to optimize the next step in the process.</p> <p>While bearing in mind the overall outcome of water security across phases, two particularly important aspects of this principle include: (1) adjusting based on the needs of watershed contexts & beneficiaries, and (2) measuring & reflecting upon the current success of NbS deployed to inform prospective activities.</p>
<p>BE FLEXIBLE AND ADAPTIVE</p> 	<p>The program preparation phases particularly require you to be flexible and adaptive.</p> <p>The original, expected or even desired intervention or outcome may not be feasible, in which case it is important to be open to an alternative, more suitable, option.</p> <p>Flexibility in your process will allow for the greatest room to experiment and therefore optimize the method and outcome.</p> <p>During the implementation stage, flexibility will come in the form of overcoming the day-to-day realities of delivering the program.</p>

FIGURE 5. Principles to bear in mind across the WIP Program Development Lifecycle.

2.4 Establishing Smart Objectives

As you advance towards the Execution phase, it is critical to develop SMART (Specific, Measurable, Agreed, Realistic, and Time-Bound) Objectives to guide rollout and delivery of the WIP. Such a vision should include a target NbS Investment Portfolio, an estimated level of ecosystem service provision and associated water security outcomes estimates, and a realistic delivery timeframe informed by elements such as resource commitments and available implementation capacity. Furthermore, SMART Objectives should also address elements such as governance arrangements and funding profile.

Figure 6 highlights how SMART Objectives are established by first ideating an indicative Theory of Change with stakeholders during Pre-Feasibility, moving to a defined NbS Investment Portfolio in Feasibility, and finalized SMART Objectives that are endorsed by your WIP stakeholder group at the conclusion of Design phase. The SMART Objectives are then operationalized during Execution phase.

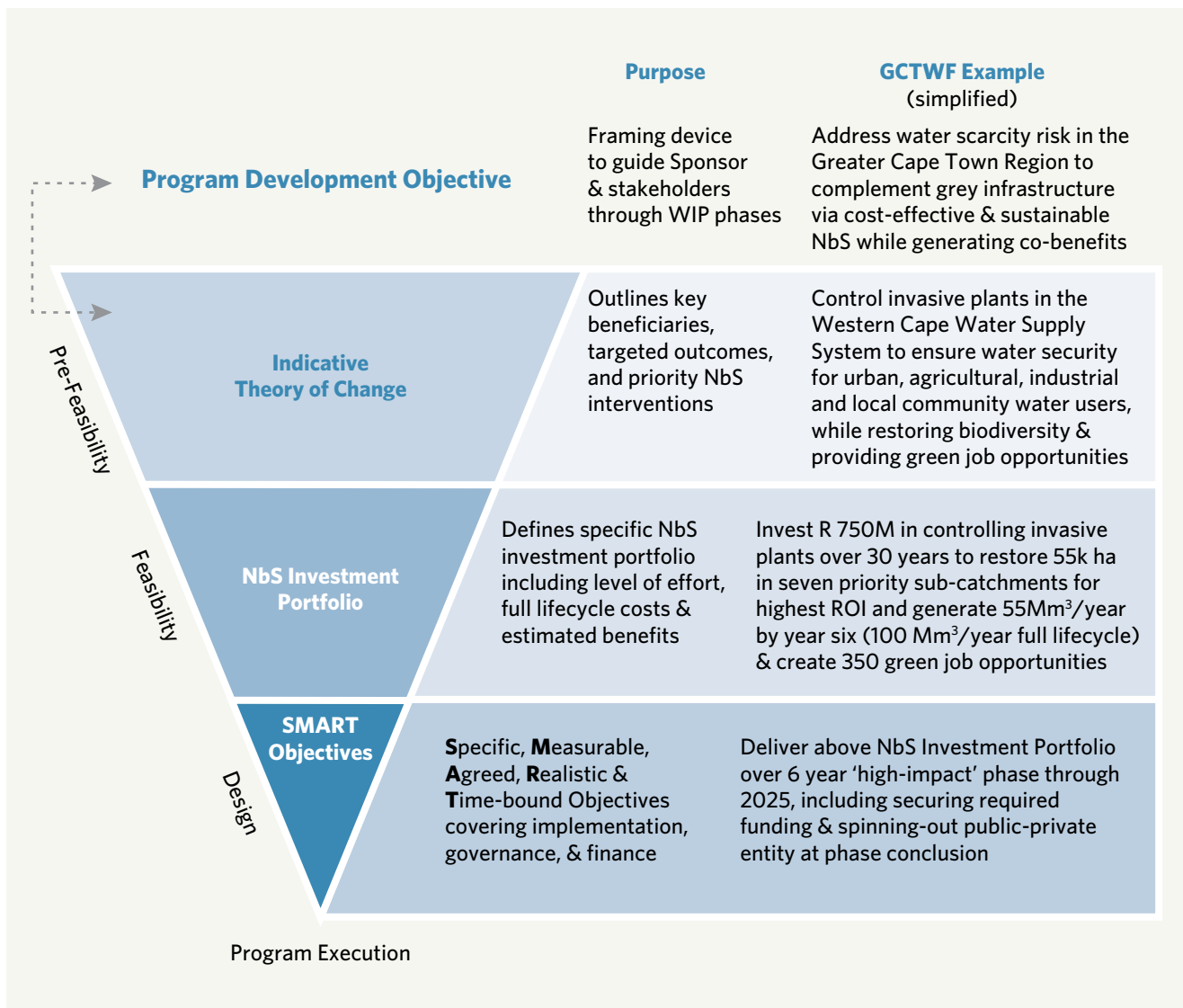
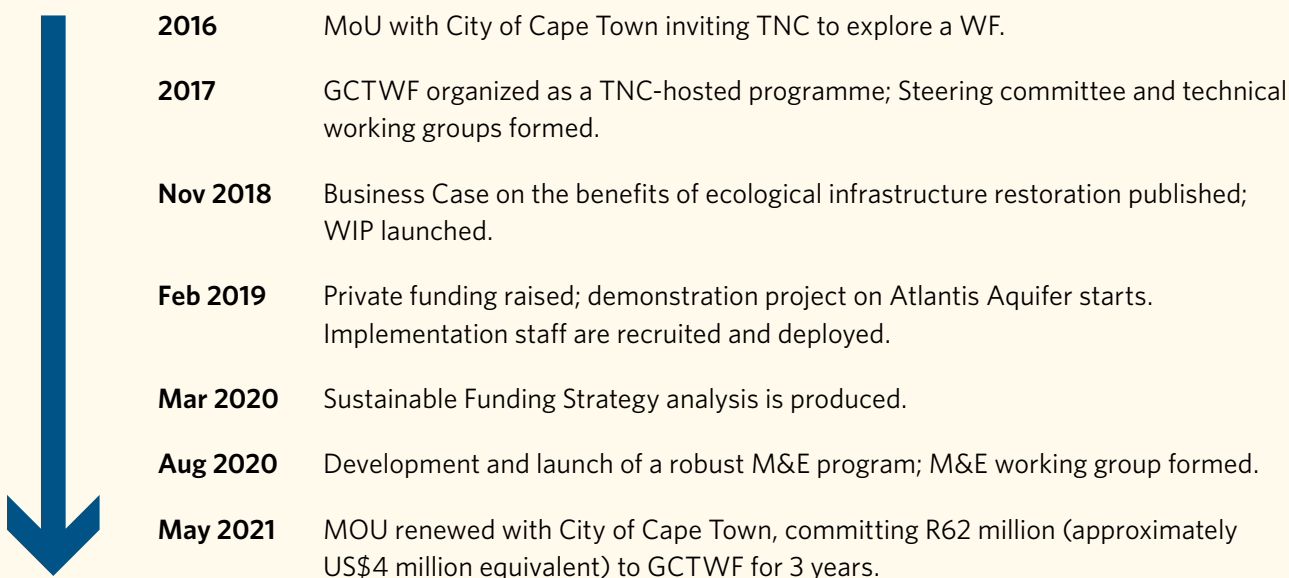


FIGURE 6. SMART Objectives development diagram by phase featuring Greater Cape Town Water Fund example (simplified).

CASE STUDY INTRODUCTION: THE GREATER CAPE TOWN WATER FUND

The Greater Cape Town Water Fund (GCTWF) came together as a collective action mechanism in 2017 to enhance water security for all users of the Western Cape Water Supply System. It is an example of a Watershed Investment Programme (WIP).

The GCTWF was started as a TNC-led programme amidst a three-year drought in the Greater Cape Town Region that seriously threatened the City's water security. It was established with a series of government, private and NGO partners to fill a gap where there was a lack of prioritisation, coordination, and funding between different government entities, which formed a barrier to efficient and sustained execution of projects. A timeline of its development so far includes:



The Greater Cape Town Region receives its water from sub-catchments of the Boland and Grootwinterhoek Strategic Water Source Areas through the Western Cape Water Supply System (WCWSS). The WCWSS is made up of 14 dams and three aquifers connected by an 11,600 km pipeline network, several storage reservoirs, pumping stations, and canals. The main aquifers include the Atlantis Aquifer, the Table Mountain Group Aquifer, and the Cape Flats Aquifer.

Over two-thirds of the sub-catchments supplying the WCWSS are affected by alien plant invasions, such as pines, Australian acacias, and eucalyptus, reducing the amount of water that reaches the rivers and dams that feed the region. In response to this, the GCTWF is aiming to clear 54,300 ha across seven priority sub-catchments by 2025 to generate annual water gains of over 55 billion litres (55 Mm³) a year.



THIS CHAPTER OUTLINES

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The critical importance of stakeholder engagement and partnership formation in the WIP preparation and implementation process.

It further presents the concepts of Sponsors and Champions and the importance of each role.

3.0

Partnerships, Sponsors and Champions

3.1 The Importance of Partnerships

Although the form and focus of every WIP will be different, all WIPs require partnerships to meet their objectives. Water security issues are multi-dimensional and affect and engage multiple stakeholders, particularly when upstream source watersheds are also considered. From the beginning of the process, it is important to understand the stakeholder landscape and how the WIP will fit into this landscape. Building strong partnerships through targeted stakeholder engagement, both to deliver your WIP, and to enable your WIP to thrive in its institutional environment, is a critical element in each phase.

GROUP	SPONSOR	WATERSHED MANAGEMENT	IMPLEMENTER	FUNDING & FINANCING	ADVISOR
Water Users & Operators	X			X	X
Government Agencies & Parastatals	X	X		X	X
NGOs & IGOs	X				X
Indigenous Peoples & Local Communities		X	X		X
Agricultural Associations			X		X
Development Finance Institutions	X			X	X
Donors				X	X
Technical Experts					X

FIGURE 7. Typical partnership roles played in WIPs, presented by institutional grouping.



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Partners that may be relevant for your WIP include:

- **Local, regional and national public sector institutions and parastatals** including local government, water regulators, environmental authorities, basin authorities, and water utilities. These parties are likely to have substantial influence within the WIP's local service area.
 - **National government**, usually to inform regulation and as a counterparty for sovereign loans.
 - **Private sector** water users including corporates and industrial users that are usually downstream beneficiaries and may be motivated to provide WIP funding.
 - **Indigenous people and local communities** which are typically involved as upstream actors and are essential to WIP success and social acceptance. These parties should be involved in decision-making as they often host and implement the NbS interventions, provide valuable perspectives to inform thoughtful portfolio development, and participate in localized WIP benefits. See box "Engaging Indigenous Peoples and Local Communities".
 - **Agricultural associations** such as irrigation boards and farming co-ops that alternately may act as a WIP investor/beneficiary or as an upstream actor to help drive WP implementation.
- **Non-governmental organizations and Development Finance Institutions** seeking economic, social, or environmental development outcomes; these groups often act as WIP Sponsors (see Section 3.3).
 - **Technical experts** that help inform the various activities required for WIP rollout.
 - **Donors** in the form of public sector international cooperation or private philanthropy seeking to achieve development outcomes.

3.2 Stakeholder Engagement Milestones by Phase

Given the complex interdependencies and overlapping mandates within watersheds, even straightforward WIPs require multi-pronged stakeholder engagement and communication efforts to succeed.

Figure 8 highlights key milestones to reach consensus on with your stakeholder group before moving on to the next stage with a view towards maximizing likelihood of successful program preparation and implementation. Note that different forums and interaction avenues will be required to engage the various stakeholder group categories, and care should be placed in ensuring that the engagement vehicle is suitable for the target audience.

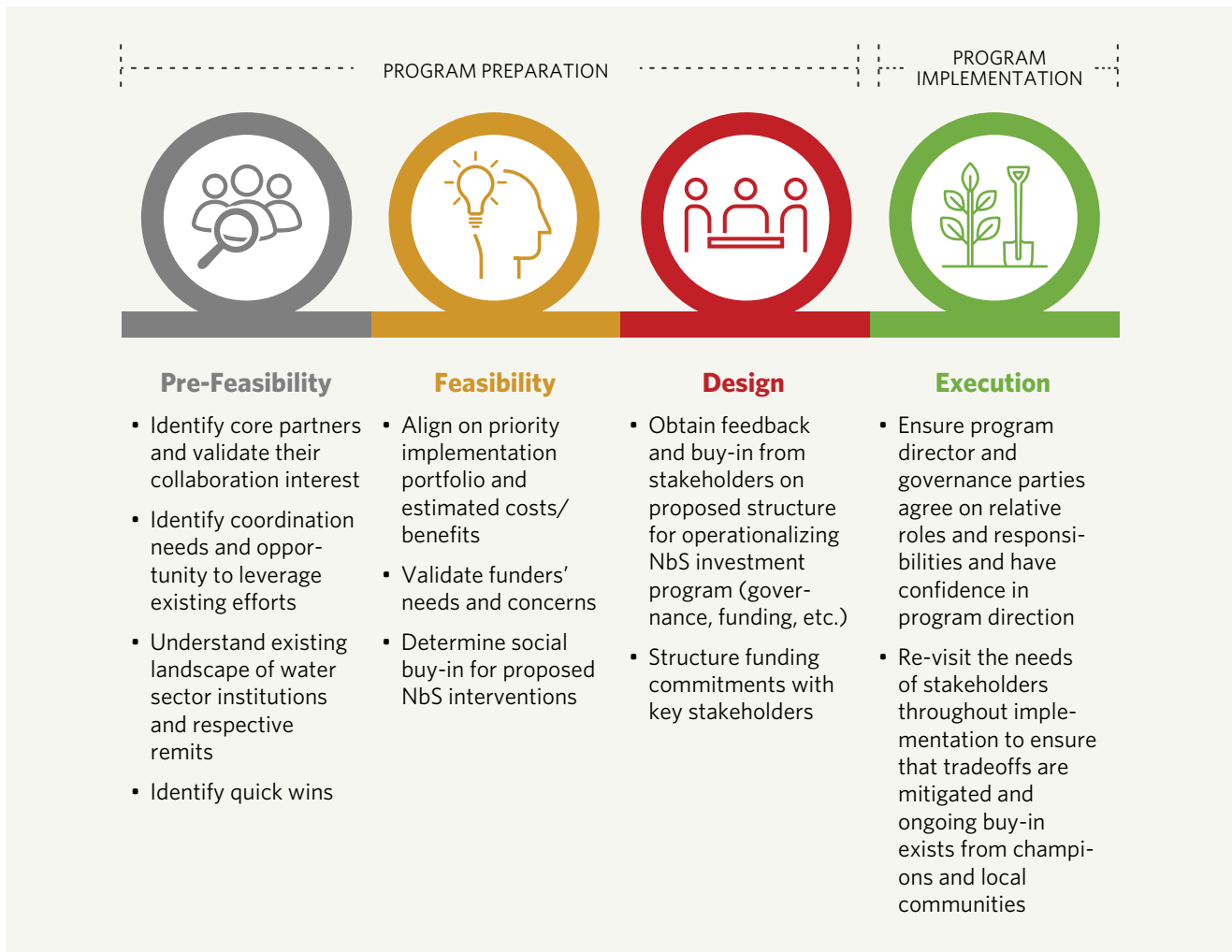


FIGURE 8. Stakeholder Engagement by Phase.

3.3 The Roles of Sponsor and Champions

Every WIP will look different, however WIPs typically require a Sponsor and one or more Champions. These two roles can sometimes be accomplished by the same person or entity, but typically are split among multiple parties. For both the sponsor and champion, it is important that they have clear mandates as to who is responsible for driving which aspect of the WIP development process.

- A Sponsor.** The institution that kicks-off the WIP development process and is the principal leading force for organizing resources and stakeholder engagement through the end of Design Phase. The Sponsor is often an existing local counterparty with significant watershed influence (e.g., water utility, local government, basin authority or NGO). This party may or may not continue to lead the WIP during Execution Phase.
- A Champion.** A local individual, often representing an institution, with significant pre-existing knowledge of local watershed management and is motivated to advocate for the WIP and its cause. They are a driving force, cheerleader, and spokesperson for the WIP; moreover, they typically have political and institutional gravitas that enable them to be an effective advocate. If there is a WIP Steering Committee, Champions typically sit on such structures and may even chair them. In some cases, champions may instigate the initial idea of WIP formation; furthermore, Champions may initiate the WIP concept (effectively acting both in 'Sponsor' and 'Champion' capacities).

What do Sponsors look for in Champions?

- A locally **recognizable and respected** figure with a good reputation. Connections make up a large part of their role, which makes it critical that the Champion is not viewed as polarizing by potential partners.
- A **natural leader** who cares about the challenges of the area of focus.
- **Knowledge of water sector systems and processes** that enables the Champion too provide ongoing thoughtful strategic guidance.
- An individual who is **committed to water security and NbS**. They are not put off by the complex process, and are willing to dedicate time, connections, and resources to the WIP
- An individual with **business acumen and project direction** skills. They understand that results and resources are required to meet time-bound stakeholder expectations

Please note that these qualities are 'ideal' features. In reality, it may prove difficult to find a sponsor or champion to fill all these criteria. In any event it is often appropriate and relevant to rely on multiple champions to help advance the WIP, which means these capacities can be split among multiple parties.

How to choose and incentivize champions

Committed champions may be hard to find but can be essential to the success of the WIP. Although it may be tempting to entice potential champions to take on the role, typical incentivizing methods can be tricky as it is important for Champions to maintain an outcomes-first orientation. Often, if champions need to be incentivized, persuaded, or compelled to lead the WIP, the risk is that they are not willing to commit to the WIP in a holistic fashion.

Sponsor & Champions in Action: Profiles for the GCTWF

The following examples showcase the sponsor and champion in action for the GCTWF, Louise Stafford and Peter Flower respectively.



The Sponsor. The Nature Conservancy, represented by Louise Stafford

Louise joined The Nature Conservancy in January 2017 as Source Water Protection Director, South Africa. She is passionate about working with others to find innovative solutions for restoring and protecting nature.

Louise grabbed the opportunity to establish a Water fund for the Greater Cape Town region with both hands. She recognized that the innovative governance and funding Water Fund model would be a powerful mechanism to help address the challenge of watershed restoration in South Africa.

Louise has over 20 years' experience in invasive species management. She established a monitoring and evaluation program for CapeNature and assisted managers in protected areas to develop systems for planning, tracking and reporting progress. She graduated with an MSc (Entomology) from Rhodes University, Grahamstown.



The Champion. Peter Flower, ex-Director of Cape Town's Water & Sanitation Department

Peter has over 40 years of experience in the water sector, mostly at the City of Cape Town. Since the late 1970s, he has been responsible for the planning and development of a significant portion of the bulk water supply infrastructure for the Greater Cape Town area.

When presented with the Water Fund concept by Louise Stafford in 2017, Peter gave it his full support. As Director of Cape Town's Water & Sanitation Department at the time, he was instrumental in making the City a major stakeholder partner. He supported the concept of developing a dedicated fund for investing in nature-based solutions to bolster the City's water security plans. The creation of a Water Fund seemed an obvious and a very welcome solution to dealing with the lack of real effective action on the part of the appropriate responsible authorities to arrest the flourishing alien plant invasion in the catchments.

Peter laid the institutional foundations of the Water Fund concept within the City of Cape Town. His efforts meant that the City is fully committed to the Water Fund program, as stated in the New Water Strategy—which was approved by City Council in May 2019. Under this metropolitan strategy, the City of Cape Town has committed a significant 3-year investment for clearing invasive trees in its budget to the GCTWF.

Peter is a registered Professional Engineer and Fellow of South African Academy of Engineers (SAAE), South African Institution of Civil Engineering (SAICE) and Water Institute of Southern Africa (WISA).

Engaging Indigenous Peoples and Local Communities

Environmental programs to conserve freshwater resources and promote human development are more likely to achieve positive, long-term outcomes for people and nature when led by Indigenous peoples and local communities (IPLCs). It's important that watershed investment programs are designed to strengthen the Voice, Choice, and Action of IPLCs, especially if the program could impact or involve the management of traditional lands and waters:

- **Voice:** inclusion of traditional knowledge, identity, local priorities, and values in developing your WIP's NbS intervention portfolio, objectives, strategic and annual operating plans.
- **Choice:** builds leadership and engagement in your WIP's decision-making process.
- **Action:** opportunities for communities to initiate and participate in the implementation of your WIP and the management of resources that affect their well-being.

TNC's Freshwater Community-Based Conservation program has developed guidance on how to apply the Voice, Choice and Action framework in the context of freshwater resources, defined as "any body of water that is fresh (not salty), together with its associated species and ecosystems resources, including aquatic plants and animals such as fish." (Zhang, W., 2020).

The VCA Framework outlines four interconnected approaches to achieve strong Voice, Choice, and Action for IPLCs:

1. *Secure Right to Territories and Resources: community members' confidence that their claims to freshwater resources will be respected by others, and that negative impacts arising from others' uses will be distributed fairly*
2. *Strong Community Leadership and Capacity: communities should have the ability to govern its freshwater resources to support livelihoods, biodiversity and sustainable development, including the ability to mobilize resources and to resolve conflicts*
3. *Effective Multistakeholder Platforms for Decision-Making (which could be a WIP): multi-stakeholder platforms can be a means of developing the capacity of communities, creating social networks, and exchanging knowledge and information, all of which has the potential to promote equity and diversity*
4. *Environmentally Sustainable Economic Development Opportunities: for communities whose livelihoods are particularly dependent on freshwater resources, environmentally sustainable economic and development opportunities create incentives for communities to sustainably manage and use freshwater and land resources*

Read how to apply the Voice, Choice and Action framework [here](#), and learn more about [TNC's Freshwater Community-Based Conservation](#) program.



THIS CHAPTER OUTLINES

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Deep Dives:

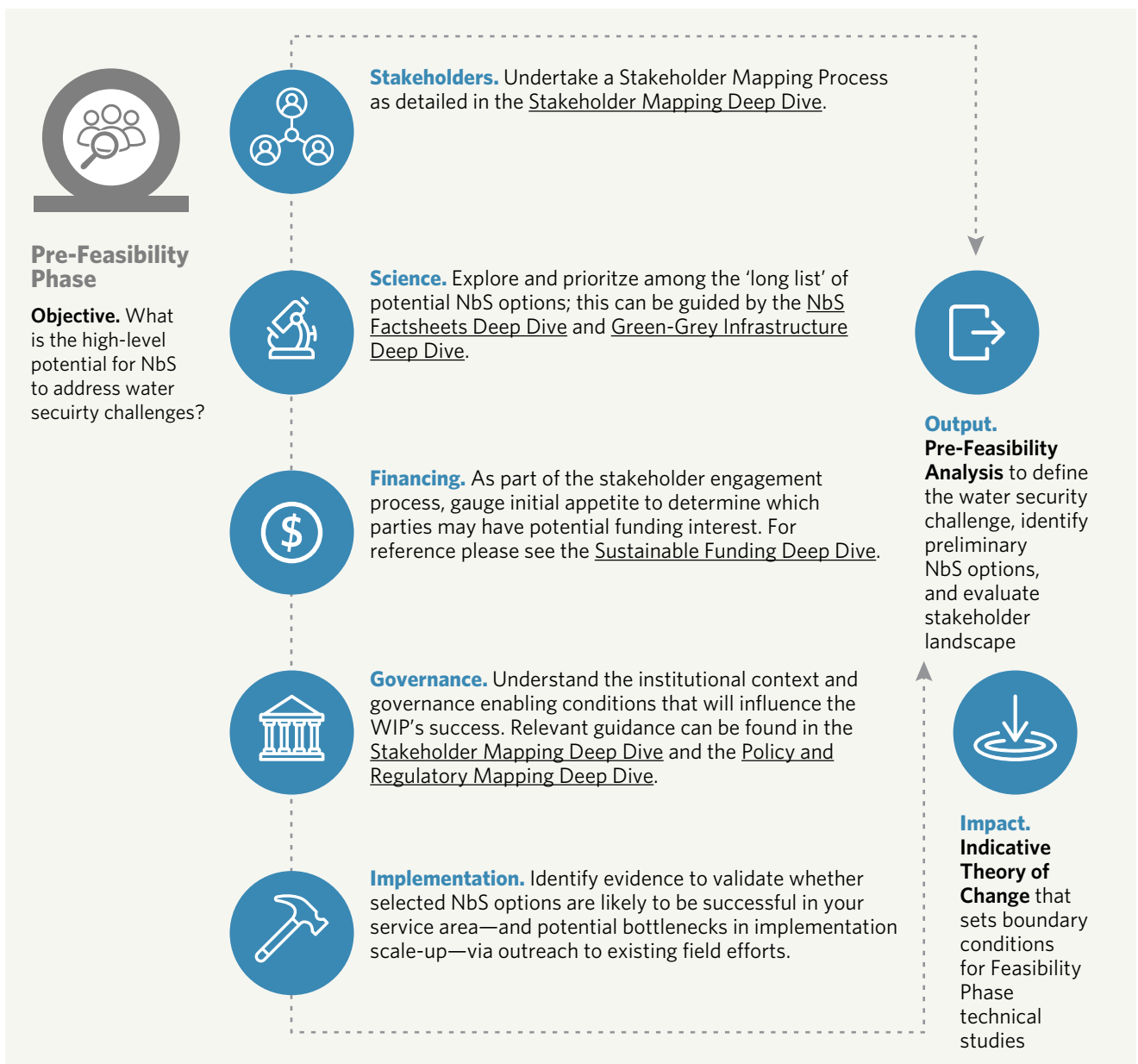
- Governance
- Green-Grey Infrastructure
- NbS Option Factsheets
- Policy & Regulatory Mapping
- Stakeholder Mapping
- Sustainable Funding

At conclusion, you should have:

- Mapped your stakeholder and regulatory landscape
- Selected your preliminary NbS options
- Identified potential funding sources
- Developed the WIP's indicative Theory of Change

4.0

Pre-Feasibility



The Pre-Feasibility phase is a crucial first phase of exploration, to develop an understanding of the situation and set priorities. The main purpose of this phase is to understand your high-level context so as to take the first steps towards the establishment of a WIP. During this phase you will focus on the key questions that need to be addressed to arrive at a go/no-go decision to move to Feasibility Phase with the support of your stakeholder group.

CORE QUESTIONS

Core Questions that should be addressed during this phase include:

- **What water security challenge(s) are you seeking to address?** A clear definition of the water security ‘problem statement’ and associated drivers will inform the potentially relevant NbS options and help frame WIP’s core technical objectives.
- **Which NbS options are relevant?** NbS are landscape-specific and need to be appropriate for the water security challenge(s), local ecology, and land use context. The social acceptance and hosting/implementation requirements by local communities are important factors to consider at this stage.
- **Which stakeholders care, and why?** Stakeholders tend to engage if (1) they are themselves affected by these water security challenges and want to contribute to addressing them, (2) if they feel that there can be benefits associated with doing this jointly with others, or (3) if they have a broader interest, such as restoring biodiversity or helping others adapt to the impacts of climate change.
- **Is there a favourable institutional and funding context?** Local political and governance bodies create enabling conditions or challenges for WIP success, and a stable political landscape can favour institutional stability.
- **Is collective action likely to fill an important gap?** The landscape your WIP finds itself in may already host a number of existing initiatives. Thoughtful WIPs should seek to build on success and complement (versus duplicate) activities.

OUTPUTS

Pre-Feasibility Package: This is an interconnected set of activities that includes the following aspects; for further info see ‘Output Detail’ section.

- Establishing a data repository,
- Conducting a pre-feasibility analysis,
- (Optional) Preliminary ROI evaluation (see [WaterProof](#) as potential tool for executing),
- Go/no-go matrix evaluation.

[OPTIONAL – IF ‘GO’] Memorandum of Understanding (MoU): Assuming a promising pre-feasibility analysis is completed leading to a ‘go’ matrix evaluation, it is likely appropriate to structure a MoU, or equivalent agreement (e.g., collaborative charter) among your core champions to inform the key parameters that define Feasibility Phase. The agreement should detail roles & responsibilities among parties, define overall activities, and ideally should include one or more funders identified during the stakeholder mapping exercise.

Top Tips as you begin your Pre-Feasibility journey:

- **Rely on existing data:** Your pre-feasibility efforts should rely principally on existing data and studies to quickly arrive at a go/no go decision on whether to invest substantial time, resources, and effort in Feasibility.
- **Focus on stakeholder mapping and engagement:** While time-consuming, thoughtful early stakeholder mapping (as outlined in the [Stakeholder Mapping Deep Dive](#)) helps you identify key partners, champions, & potential funding sources, understand institutional mandates, and think through risk factors.
- **Engage with existing initiatives that have similar goals:** Any existing efforts that appear aligned with the WIP’s potential goals should be engaged with early to explore collaboration and mutual learning opportunities.

- **Learn from existing NbS implementation examples:** Understand the lessons learned from existing local efforts by conducting a site visit. This allows you to obtain a feel for what the implementation process looks like, who can execute, and what the bottlenecks are for scale-up within the local context.
- **Keep an open mind:** Remain open to what you hear from stakeholders and what the data tells you.

OUTPUT DETAIL

The Pre-Feasibility Package

 WHAT IS IT?	 KEY COMPONENTS	 LEVEL OF EFFORT														
<p>The Pre-Feasibility Package is a holistic analytical package that provides a rough scoping for your WIP and creates an interface point for stakeholders to register their interest and support.</p> <p>It culminates with a Go/No-Go Evaluation, and in the case of 'Go' the signing of an In-Principles Agreement with your core stakeholders to partner together in the Feasibility Assessment.</p>	<ol style="list-style-type: none"> I. Data Repository: Centralized repository of relevant existing publications, documents, & analysis to support the process II. Pre-Feasibility Analysis: Summary document that provides high-level holistic evaluation of WIP potential III. Pre-Feasibility ROI Evaluation (optional): Indicative ROI relying on global data sets, coarse biophysical models, & rough costing info (see WaterProof as potential execution option) IV. Go/No-Go Evaluation: Multi-dimensional scoring rubric to assist stakeholders with understanding their interest to move to In-Principles Agreement 	<p>Time Required: 5-7 months</p> <p>Key Experts & Working Days (estimate)</p> <table border="0"> <tr> <td>Stakeholder engagement:</td> <td style="text-align: right;">25</td> </tr> <tr> <td>Project management:</td> <td style="text-align: right;">30</td> </tr> <tr> <td>Economics & finance:</td> <td style="text-align: right;">15</td> </tr> <tr> <td>Science management:</td> <td style="text-align: right;">15</td> </tr> <tr> <td>Hydrology:</td> <td style="text-align: right;">10</td> </tr> <tr> <td>GIS & Cartography:</td> <td style="text-align: right;">20</td> </tr> <tr> <td>Total estimated working days:</td> <td style="text-align: right;">115</td> </tr> </table>	Stakeholder engagement:	25	Project management:	30	Economics & finance:	15	Science management:	15	Hydrology:	10	GIS & Cartography:	20	Total estimated working days:	115
Stakeholder engagement:	25															
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Science management:	15															
Hydrology:	10															
GIS & Cartography:	20															
Total estimated working days:	115															

The essence of the Pre-Feasibility Package is the Pre-Feasibility Analysis document that—at a preliminary, indicative level—evaluates core WIP elements on a holistic basis that are then further refined and formalized during Feasibility and Design. Important aspects evaluated by the Pre-Feasibility Analysis include:

- **Technical profile** that considers the water supply system, watershed conditions, and water security challenge(s) within the study areas. This desktop study should identify the main physical watershed processes and also identify the proposed geographic area of influence where NbS are considered.
- **NbS evaluation** that reviews the 'long list' of potential NbS options (see [NbS Option Factsheets Deep Dive](#)) to identify relevant options based on the local ecology, ability to address the water security challenge(s), existing success/proof points, and indicative levels of social acceptance. This evaluation provides the basis for creating a priority NbS 'short list' that is formally evaluated during the Feasibility Assessment.
- **Institutional profile** that sets out the key actors, laws, policies, strategies, roles and mandates that define the regulatory landscape relevant to the WIP on both an upstream (watershed management) and downstream (water management) basis.
- Overview of **existing and planned initiatives** to understand opportunities to crowd-in partners, leverage existing efforts, and avoid duplication.

- Stakeholder mapping for **funding considerations**, so as to evaluate and prioritize the various funding streams that your WIP can consider mobilising.
- Stakeholder mapping of **implementation considerations**, especially with regards to local communities, so as to evaluate and prioritize NBS interventions regarding social acceptance and execution absorption capacity.

4.1 Analytical Workstreams

4.1.1 PRE-FEASIBILITY: STAKEHOLDER ENGAGEMENT

The first step in stakeholder engagement is to explore the stakeholder landscape, which encompasses individuals and entities located both upstream and downstream in the catchment. These stakeholders are those who are responsible for, benefit from, and fund watershed stewardship and water management.

To understand your stakeholder landscape, it is recommended you undertake a stakeholder mapping process. Mapping stakeholders and analysing their mandates and priorities, thereby enabling you to determine which stakeholders 'matter' to the NbS process and how to engage them. This process is outlined in further depth in the [Stakeholder Mapping Deep Dive](#) and summarized in the six steps provided opposite. Following this process, it is recommended to develop an engagement plan that outlines the overall strategy for stakeholder engagement.

Stakeholder Mapping Steps

- Step 1: **Define** the scope of your analysis.
- Step 2: **Identify** the relevant actors and set up their basic profiles.
- Step 3: **Analyse** the actors' interest and influence.
- Step 4: **Map** the analysis of your stakeholders.
- Step 5: **Tabulate** your analysis.

Stakeholder engagement occurs continuously throughout the WIP establishment process. That said, key focus areas during the pre-feasibility phase include:

- **Identify core partners and understand their interests and capacity for collaborating:** There will be a large number of stakeholders identified in the initial mapping process, each of which has a unique rationale and mandate for partnering. It is critical to understand the potential contribution these stakeholders can bring (e.g., funding, advisory, implementation capacity, leveraging complementary efforts) and the friction costs for collaborating (more is not always better).
- **Evaluate existing initiatives, leverage collaboration opportunities and identify associated coordination needs:** Stakeholders may conduct existing NbS activities in your selected area which should be viewed as a fantastic opportunity for learning and potential partnership. It is important to understand the mandate for these initiatives, future planned activities, and whether a new WIP is indeed necessary (versus simply expanding or building upon existing initiatives). Evaluating required coordination needs for operating in a genuinely complementary fashion should be carefully considered.
- **Determine social buy-in & implementation potential for target NBS:** You will need to understand what incentivises stakeholders—in particular local communities—to engage and act as advocates for the WIP. This is particularly important for situations where selected NbS primarily delivers water security benefits

downstream, resulting in a lack of direct benefits to surrounding communities. It is important that those who live and work near the NbS are motivated to ensure its protection and sustainability. Lastly, land tenure and water management rights can be extremely complex, involving layers of formal and informal obligations and history, and therefore care should be taken that proposed NbS are not only scientifically relevant from a water security lens, but also realistically implementable from a practical operational perspective.

- **Identify quick wins:** You may find that there are opportunities for quick wins, for example a local NGO that has funding to field-test pilot NbS implementation at local sites which can serve to de-risk elements during Feasibility and Design. Early proof points can serve to garner and accelerate stakeholder interest in the WIP development process.

At Pre-Feasibility phase conclusion you should have a holistic understanding of the WIP’s stakeholder landscape, identified key partners, and—assuming a promising pre-feasibility analysis yield a ‘go’ determination—established a Memorandum of Understanding (MoU) or similar appropriate agreement with these partners to move towards Feasibility Assessment.

4.1.2 PRE-FEASIBILITY: SCIENCE

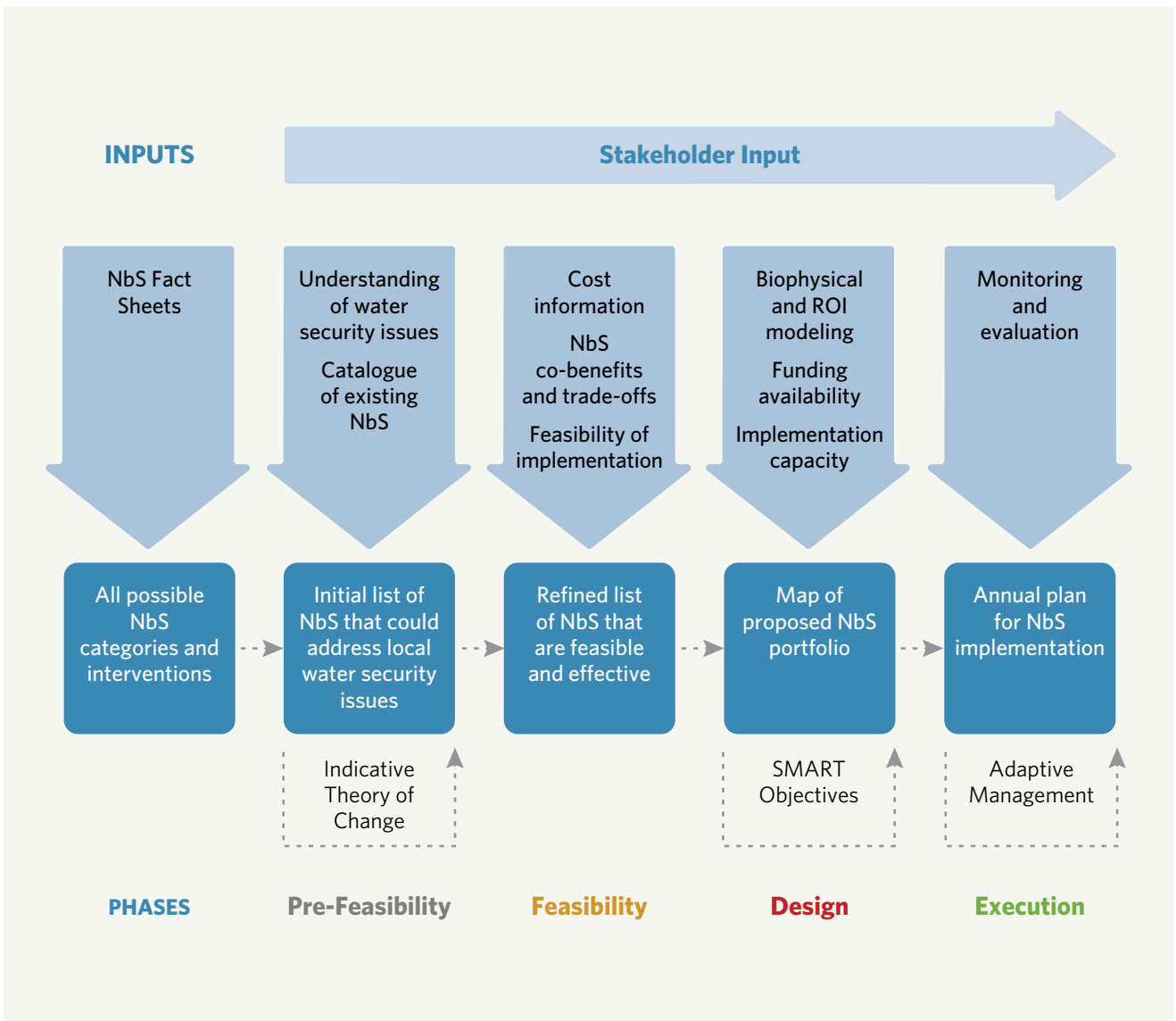


FIGURE 9. Process for narrowing and selecting NbS types with the NbS Investment Portfolio.

During the pre-feasibility phase, your key focus should be on **identifying and understanding** which technical NbS options can most effectively address the key water security challenges that your program seeks to address and that are appropriate for the local biophysical and socioeconomic situation. Key priorities at this stage include:

- **Identify water security challenges and their drivers:** consider challenges for delivery of household, urban, agriculture, energy and environmental water security, including water quantity and water quality issues and resilience to water-related natural disasters.
- **Identify WIP Geographic Area of Influence:** define the area in which you are looking to conduct NbS investments, which could be defined based on source watershed boundaries, floodplain boundaries or water recharge areas, administrative boundaries or other relevant units.
- **Identify relevant water bodies and their characteristics:** determine where water bodies (lakes, streams and groundwater aquifers) are located and their characteristics in terms of water flow and water quality.
- **Identify main hydrological driving processes:** provide a hydrological description of the area, which can be derived from literature and available rainfall and runoff data. These outputs will help identify the appropriate hydrological model to use during Feasibility phase.
- **Identify land cover and landscape alterations:** determine dominant land cover and land use patterns, and outline how landscapes of interest have been altered and the factors that influence these changes. Underlying geology and soils should also be described at this stage.
- **Identify existing grey water infrastructure:** determine where water reservoirs are, what their capacity is, their main water users, current and future water demand and supply of the system
- **Identify interventions:** determine which interventions, such as NbS, might provide benefits to water security, biodiversity, grey infrastructure issues and other outcomes, and the scale at which such interventions would need to be delivered on for delivering meaningful outcomes.

Much of your understanding of water challenges during this phase is likely to derive from existing studies and conversations with experts. You will need to fill gaps through review of existing publicly available datasets. It is important to consider future changes in water security challenges and landscape alterations in addition to present or past trends. Note that the data that is utilised for your scientific study should be stored in a data repository and will make up part of your Pre-Feasibility Analysis.

Identification and selection of an NbS portfolio for the WIP is a multi-step, iterative process as shown in Figure 9. During the Pre-Feasibility phase you will narrow down from a full range of available NbS options to a reduced set of specific NbS interventions that have the potential to address key water challenges and build watershed resilience. In subsequent steps, this list will be further refined, mapped across the watershed, analysed, and finalized into an NbS portfolio that underpins the program and an annual implementation plan.

There are a variety of NbS and configurations of green/grey infrastructure for any given water security situation. To assist in your understanding of the options open to you please see the [NbS Option Factsheets](#) and [Green-Grey infrastructure Deep Dives](#). A summary of the high-level NbS option categories, the water security challenges they address, and the potential for driving co-benefits, is provided in Figure 10. Furthermore, the [NbS Benefits Explorer Tool](#) may be useful to identify and account for the benefits from NbS interventions.

WATER SECURITY CHALLENGE	WATER AVAILABILITY		DISASTER RISK	WATER QUALITY		POTENTIAL FOR OTHER BENEFITS
	Dry season flows	Groundwater recharge	Flood risk	Erosion & sediment	Nutrients & pollutants	
Protection						
1. Targeted habitat protection	✓	✓	✓✓	✓✓	✓	
Restoration						
2. Revegetation	✓	✓	✓✓	✓✓	✓	
3. Riparian restoration	✓	✓	✓	✓✓	✓✓	
4. Wetlands restoration	✓	✓	✓✓	✓	✓✓	
5. Floodplain restoration	✓	✓	✓✓	✓✓	✓	
Management						
6. Agricultural Best Management Practices (BMPs)		✓		✓✓	✓✓	
7. Ranching BMPs	✓	✓		✓	✓	
8. Forestry BMPs	✓			✓	✓	
9. Fire Management			✓✓	✓✓	✓	
Created Habitats						
10. Artificial wetlands	✓	✓	✓	✓	✓✓	
11. Sustainable Urban Drainage Systems (SuDS)	✓✓	✓	✓✓	✓	✓✓	

LEGEND	LOW	MEDIUM	HIGH
Magnitude of benefit			
Depth of evidence		✓	✓✓
Potential for multiple other benefits			

FIGURE 10. Summary table adapted from NbS Option Factsheets Deep Dive comparing typical water security benefits addressed and potential for co-benefits.

4.1.3 PRE-FEASIBILITY: FUNDING & FINANCING

The primary financing-question addressed during Pre-Feasibility is: What are potential funding sources that could cover the costs of the WIP? Which are the potential entities that could allocate such funding, and are there any regulatory/policy restraints that need to be overcome for disbursement? As such, during the stakeholder mapping process it is important to identify these potential sources and reach out to the entities who can allocate associated funding to understand whether and how the WIP meets can meet their specific mandates and needs.

Figure 11 presents a variety of typical stakeholders found in WIP, and the particular benefits (either water security, or co-benefits) that might motivate them to become a funding agent. Importantly, funding might be provided as a direct contribution, or existing basin actors may choose to align their efforts as part of the WIP’s overall implementation vision.

To ensure maximum success as you enter Feasibility, it is important to have your potential WIP funder(s) as signatories to the MoU or similar appropriate agreement, and that these parties sign-off on the parameters and scope for the Feasibility Assessment. This will ensure that Feasibility results can suitably meet their internal ‘burden of proof’ to unlock funding commitments. For additional detail see the [Sustainable Funding Deep Dive](#), which outlines the connection of this workstream across the WIP development lifecycle.

		PRIORITY WATER SECURITY BENEFITS			PRIORITY CO-BENEFITS			RESOURCING METHOD	
		Water Availability	Water Quality	Disaster Risk	Biodiversity	Carbon	Sustainable Livelihoods	Funding Provider	Alignment Opportunity
Public	Basin authority								
	Environmental authority								
	Local government								
	Water regulator								
Public/ Private (depending)	Hydropwer								
	Irrigation board								
	Water allocator/ utility								
Private	Agricultural association								
	Subsistence agriculture								
	Insurers								
	Corporations								
	Philanthropy								
	Residents & small business								
International Cooperation	Bilateral & donor agencies								
	Dev. Finance Institutions								
	Non-profits & NGOs								

FIGURE 11. Linking beneficiaries to Water Security Challenges, associated co-benefits, and opportunities for funding/ resource alignment opportunity

Lastly—and as articulated in the ‘Outputs’ section above—it may be useful during Pre-Feasibility to conduct a high-level ROI analysis to help generate stakeholder feedback on your WIP and focus efforts in subsequent phases. Such a pre-feasibility level ROI involves using global data sets, broad/general biophysical models, and

coarse costing to generate indicative ROI for your WIP. Such analysis can inform which NbS options to prioritize for your 'short list' and promote conversations with funding agents and get them fully signed up for Feasibility phase. TNC has developed an online platform that integrates a suite of software tools and global data sets that are commonly used in such pre-feasibility ROI analysis; please visit the [WaterProof](#) site to explore further. At a minimum, during Pre-Feasibility it is appropriate to conduct a rough costing exercise to understand the order of magnitude for funding resources required for WIP execution and right-size the framing of Feasibility Phase studies.

4.1.4 PRE-FEASIBILITY: GOVERNANCE

To deliver your Pre-Feasibility Study it is necessary to conduct [Stakeholder Mapping](#) and [Regulatory & Policy Mapping](#) exercises. While the exercises are presented separately for clarity, in practice the two are closely related with results from one analysis impacting the scope of the other. Often, for example, even though adequate laws may be in place, their application in practice might differ from the letter of the law. A desk analysis alone would not surface those inconsistencies and it would be necessary to complement the desk-based analysis with interviews with the stakeholders involved. Stakeholders interviewed during the stakeholder mapping process may identify additional local or national level strategic plans that were not identified during the desk-based policy analysis. It is important to conduct the two exercises in parallel and iterate on your process to paint the most complete picture possible.

Sponsors often choose to sign a working agreement—whether informal or formal—with key stakeholders to clarify commitments and roles when developing the WIP. It's important to emphasize that WIPs can change over time, and there are often interim governance arrangements that help the WIP meet its goals at the moment but can be adjusted as stakeholders move through the phases of the program development lifecycle. The most important consideration is whether the governance arrangement is helping your WIP meet the impact described during each phase, and, eventually, maximizing the likelihood the WIP will meet the defined SMART Objectives. In some cases, the interim arrangement might become the permanent governance arrangement, while in other cases, stakeholders may choose to develop a new governance arrangement to better meet the needs and objectives of the WIP as it evolves.

It is therefore important that you work with key stakeholders to establish interim governance arrangements based on results from your Stakeholder and Regulatory & Policy Mapping exercises to inform decision-making processes during Feasibility and Design phases. These governance models could take a variety of forms, with common models described below:

COMMON GOVERNANCE MODELS

- **Umbrella Agreement:** An agreement—usually an MoU or collaborative charter—between multiple parties outlining how they will work together to accomplish a shared goal. In this model, stakeholders often execute their own, separate implementation plans based on their own theory of change, and signatories agree to loosely coordinate with one another on certain aspects, most commonly, sharing data around implementation and monitoring and evaluation. Signatories do not usually work together to mobilize funding, but that is not always the case.
- **Hosted Program:** One organization is responsible for managing the development of the WIP but is guided by a Steering Committee of relevant partners. Relationships are typically defined in a Memorandum of Understanding (MoU) or Administration Agreement. As the program moves through the phases and its objectives become more defined, the hosted program may choose to develop one or more Working Groups or Sub-Committees focused on specific aspects of the program development, like science-based prioritisation of NbS or monitoring & evaluation, that may benefit from dedicated attention.
- **Dedicated Vehicle:** An autonomous, legal entity with its own staff and standard operating procedures. Many Dedicated Vehicles are non-governmental organizations, some of which are set up as tax-exempt

organizations, also commonly referred to as a not-for-profit, non-profit, or public benefit organization, which can take from 6 to 18 months to establish, depending on the country. For this reason, many stakeholders wait until the WIP has executed for a few years before exploring the potential for a Dedicated Vehicle.

Read the [Governance Deep Dive](#) to learn more about the specifics of the model, and key questions to address during this phase. Interim arrangements are likely to be either a Hosted Program or Umbrella Agreement, given that they are leveraging the structures of existing institutions, but all three models may be personalized to meet WIP needs and should be holistically considered with an eye towards maximizing the likelihood of meeting the WIPs SMART Objectives.

4.1.5 PRE-FEASIBILITY: IMPLEMENTATION

In this phase, priority should be placed on understanding the current depth of evidence base and general social acceptance for the NbS interventions your WIP is proposing. Do NbS options have multiple decades of execution history and support within the watershed management community? Is there a deep existing contracting pool that can readily be tapped into for procurement? Or alternatively, are your target NbS interventions relatively untested in the field and will require substantial piloting to ensure relevance from an ecological and community-uptake perspective? Note that this evidence base can go beyond NbS implementation within the WIP's immediate service area and also consider initiatives from relevant comparable contexts (e.g., watersheds with similar characteristics).

To make the most of existing initiatives, try to schedule interviews and visits with related conservation projects; this will help ground-truth the complexities for sourcing materials, labour, permitting processes, and community engagement that is required for NbS scale-up. Furthermore, such visits can help provide context for social realities that may be driving on land-use changes.

4.2 Understanding & Planning for Impact

In the final analysis, the common 'meeting place' that unites WIP sponsors, champions, funders, implementers, and beneficiaries is the program's impact. A WIP's impact narrative is hypothesized during the Pre-Feasibility phase, developed during Feasibility, confirmed during Design, and then ultimately implemented (and evaluated against) during Execution.

In order to design for long-term impact, it is important for you and your partners to align on how positive and sustainable change will be affected. A recommended practice for forging this common understanding is co-developing a Theory of Change (TOC). A Theory of Change is a description of a sequence of events that is expected to lead to a particular desired outcome. It shows a causal pathway from the current to the desired situation by specifying what is needed for these goals to be achieved, articulating underlying assumptions which can be tested and measured. Importantly, it outlines the assumptions behind how your chosen interventions will achieve the desired outcomes and impact (FCDO 2012).

During Pre-Feasibility, an indicative TOC should be developed that at minimum includes the target beneficiaries, the outcomes they are seeking, and the NbS interventions that are expected to provide these outcomes. Preparing the TOC is a good way to lay out the logic of the program based on the analysis carried out during pre-feasibility stage, and to assess the internal logic and identify gaps. Figure 12 provides such a Pre-Feasibility indicative TOC for the GCTWF, and also includes coloured lines for which relationship could lead to direct or leveraged funding potential.

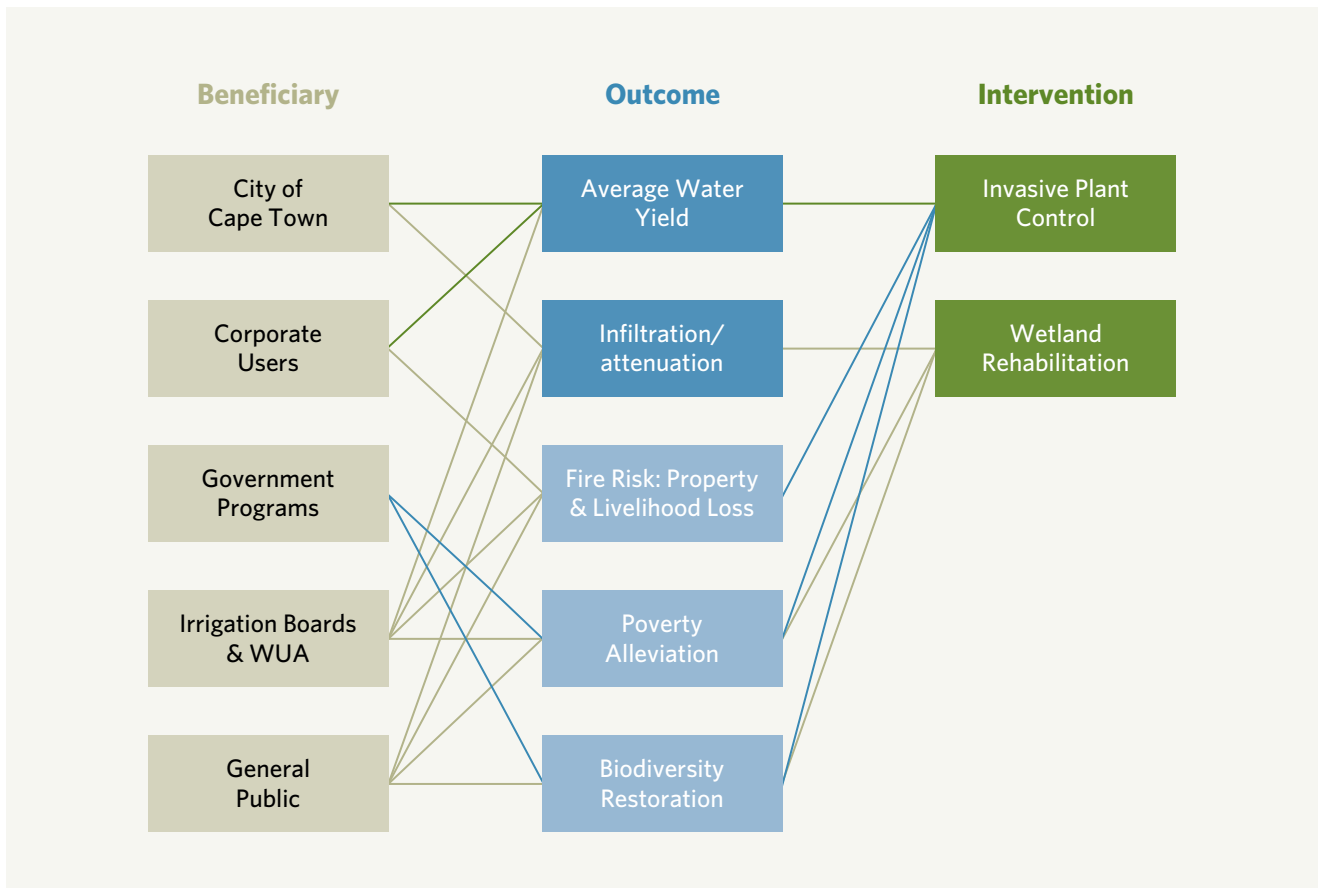


FIGURE 12. GCTWF indicative Theory of Change diagram that links beneficiaries with water security and co-benefit outcomes and the NbS interventions that generate those outcomes.

Colour legend: Green = new funding potential, blue = opportunity to align resources with existing mandates, and grey = interest but unclear direct funding potential. WUA stands for Water Users Association

By developing your indicative Theory of Change, you should be in a position to:

- **Formalize your understanding of the context** and determine how your chosen interventions are linked towards the water security challenge(s) that the WIP seeks to address. You will need to outline the evidence behind your assumptions, during which you may find evidence gaps or be presented with conflicting evidence which requires a change in approach to address the problem or additional data gathering. The two key objectives of this are to (i) thoroughly assess the strength of the evidence base for the various linkages in the TOC; and (ii) to identify the key variables that affect the likelihood of attaining the desired outputs and outcomes.
- **Clearly articulate your vision to key stakeholder and partners.** This will enable you to garner support and co-operation, but also to gain their inputs into the TOC. The process of developing the TOC should be participatory and undertaken with your partners in order to capitalise on their expertise and develop a more robust TOC.
- **Identify potential issues and risks,** as well as **potential opportunities,** which you can then plan to mitigate or take advantage of in the design of your process.
- **Engage** with stakeholders to share your WIP’s vision and help them understand how they can be impactful by joining the process.
- **Clarify and document all assumptions,** in the process making them explicit and transparent so that the WIP can revisit and revise as a critical part of adaptive management.

THE GREATER CAPE TOWN WATER FUND



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What is the water security challenge that the WIP seeks to address in Cape Town?

Cape Town does not have enough water to meet the needs of its rapidly increasing population at a rate of about 2.6 percent a year. Forecasts from 2019 suggest that an additional 300–350 million litres (0.3–0.35 million cubic meters) of water a day will be needed by 2028 to ensure that supply meets demand of Cape Town. Additionally, climate models show decreased rainfall accompanied with increased temperatures in the future, increasing the risk of water shortages. Furthermore, in 2015–2018 the Greater Cape Town Region experienced the impacts of the worst drought in a hundred years, exacerbating the impact of these factors and seriously threatening the City’s water security. The period city managers had feared that the taps would run dry, dubbed “Day Zero”, was narrowly avoided in 2018, but the threat remains. Water demand management, addressing water leaks, maintaining and upgrading water infrastructure water augmentation options, such as groundwater abstraction, water re-use and desalination to a secure water future, are important next steps, but insufficient on its own. Another important option towards a water secure future is addressing water losses in the catchments caused by alien plant invasions. Authorities are faced with the complexity of prioritizing interventions and understanding the real cost and benefits of the different options.

Which NbS options are relevant?

In addition to engineering solutions—seawater desalination, groundwater exploration, increased storage capacity and water re-use—NbS offers a long-term, cost effective and sustainable solution. GCTWF’s portfolio of interventions include a range of NbS options and supporting programmatic learning initiative. to ensure catchment restoration and long-term management:

- Restoring native vegetation in catchments and aquifer recharge areas by controlling invasive alien plants (IAPs).
- Rehabilitating, restoring and protecting wetlands and riparian areas.
- Raising awareness about stewardship of water resources.

Clearing invasive water-intensive invasive plants has been identified as the most cost-effective intervention to address the Greater Cape Town Region's water security issue. Over two-thirds of the surface area of the Western Cape Water Supply System is affected by alien plant invasions, such as pines, Australian acacias, and eucalyptus, reducing the amount of water that reaches the rivers, dams and aquifers. The challenge was where in the system to focus NbS activities to achieve the best results.

What value can a water fund play in addressing these water security challenges?

Despite ongoing efforts to control IAPs in the catchments, the problem was getting worse. Invasive plants continued to spread due to a host of factors, including: a lack of coordination between different entities in the water and environment sphere, missing prioritisation to direct resources towards highest-return areas, insufficient follow-up for cleared areas and wildfire zones, a dearth of specialised implementation teams to reach high-angle zones, insufficient overall resources, and inconsistent budget allocations for research and implementation. When combined, these factors formed a barrier to efficient and sustained execution of projects. To overcome this barrier, a new approach was needed. The Greater Cape Town, takes a long-term view, it focuses on priority areas, collective action, the pooling of resources and developing the capacity.

How were NbS options identified and prioritized?

The facts regarding the Greater Cape Town Region's water availability challenges and threats to catchment health posed by invasive alien plants were known prior to the GCTWF's establishment. In particular, a body of work already existed regarding the impact of IAPs on South Africa's water security, biodiversity and wildfire prevalence; furthermore, there were ongoing initiatives to control IAPs by programs such as Working for Water. However, the existing efforts to bring the invasions under control were not enough, a bigger scale and better coordinated collective action initiative was needed, a dynamic highlighted in the 2007 CAPE Invasive Species Strategy. To address water security challenges, and in response to the 2015-2018 drought, over R8 billion [US\$500 million equivalent] in public funding was being considered for augmenting water supply through investments in groundwater abstraction, desalination, water re-use and increased surface water storage to meet the required demand. To make the case for NbS as a viable solution to Cape Town's water security challenge, TNC, as a hosting organisation of the GCTWF, illustrated the benefits of ecological infrastructure restoration in comparison to the grey infrastructure under consideration through the business case.

The first step in the process of making the case for NbS was to identify a geographical area of focus and establish where the highest water losses to the natural environment were taking place. While attempts had been previously made to implement NbS in the catchments, these had faced difficulties partially because of the small-scale, fragmented approach of project implementation and the resources required for working in remote mountainous areas. To manage the expansive size of the WCWSS, the dam catchments were assessed to identify which areas experience the greatest water loss as a result of alien plant invasions (related to total effective extent density). Finally the sub-catchments were ranked from highest to lowest according to the greatest amount of water at the lowest cost. This helped establish priority sub-catchments for these interventions.

The Atlantis Aquifer was chosen as a priority area and demonstration project as it had a high impact potential, was in a protected area, and was managed by the City of Cape Town. As no specific studies existed for this site, TNC commissioned a year-long technical study quantifying the impact of invasive species on groundwater. The expertise of academics was sought on the proposed methodology for the study. The year-long sap flow monitoring was undertaken by the Council for Scientific and Industrial Research, a reputable institution in the area of hydrological modelling. The study showed an average loss of 830,000 litres/ha/year due to Port Jackson

(*Acacia saligna*) stands in the Atlantis Aquifer's core recharge zone. The quantification of the impact of invasive species on water flow, and its support from experts, showed that NbS were an important component of a viable solution to Cape Town's future water security.

Which stakeholders care, and why?

The GCTWF's prefeasibility activities were conducted amidst the worst drought in a hundred years. The concept of NbS as part of the City of Cape Town future water security portfolio was not seen as a priority at that stage, as this did not offer a 'quick fix' to avoid a "day zero" scenario. Motivating key actors to consider the concept was a long and iterative process, as the reasoning for scaling NbS through public-private collective action had to align with various existing interests. In the first two years of its creation (between 2017 and 2019), TNC held 20 workshops of different sizes and involving diverse stakeholders and disciplines to advocate for the Water Fund, the potential of NbS, and the need for collective action. Stakeholder groups included government representatives, water sector actors, corporates, academics, nature conservationists, NGOs' agriculture and environmental actors. These workshops raised awareness about Water Funds—what they are, what they are not—helped with information sharing, collecting input on NbS options understanding opportunities and potential barriers and requirements for collective action. They also built relationships and trust and started a dialogue with stakeholders. Experienced and trusted experts were involved in the workshops to help build momentum, validate the findings and build credibility.

The Bulk Water branch of the City's Department of Water and Sanitation became interested in the project through ongoing engagement. These engagements served to illustrate the benefits of clearing invasive plants in the Atlantis Aquifer that this department manages, including increasing water recharge and reducing its structural risk and maintenance cost. This was a compelling option given the drought and the pressure on the City to avoid "day zero". Conversely, highlighting the community benefits of implementing the project, particularly the creation of jobs, fostered the interest of local politicians. Expert academics agreed with the scientific methodology and results of the sap-flow monitoring study, and the protected area management authority were supportive of the project's objective. Having these stakeholders' support, ensured the concept of enhancing water security through NbS could be agreed on, even though the water fund concept was still unknown.

In response to the water challenges faced by the Greater Cape Town region, a coalition of public, private, and civil society partners came together to form the Greater Cape Town Water Fund Steering Committee. These included: The Nature Conservancy, National Department of Water and Sanitation, National Department of Environmental Affairs (Environmental Programmes), Provincial Department of Environmental Affairs and Development Planning, City of Cape Town, South African National Biodiversity Institute, CapeNature, Coca-Cola Peninsula Beverages, Nedbank, Remgro Ltd, and WWF-SA. With seed funding, TNC commissioned studies to evaluate the impact of NbS on water supply, beginning with targeted removals of alien plant invasions, and determined whether investing at scale in catchment restoration is cost competitive with other supply-side solutions. The studies informing the Business Case were conducted in a transparent manner by an experienced consultancy and the information was shared with the Steering Committee and technical working groups for input and comments.

Is the institutional context favourable?

Water resource management in the Greater Cape Town Region operates under a three-tiered system involving national, provincial and local government policies, strategies and institutions. National government is responsible for Water Resource Management, catchment management and also manages three of the major dams in the

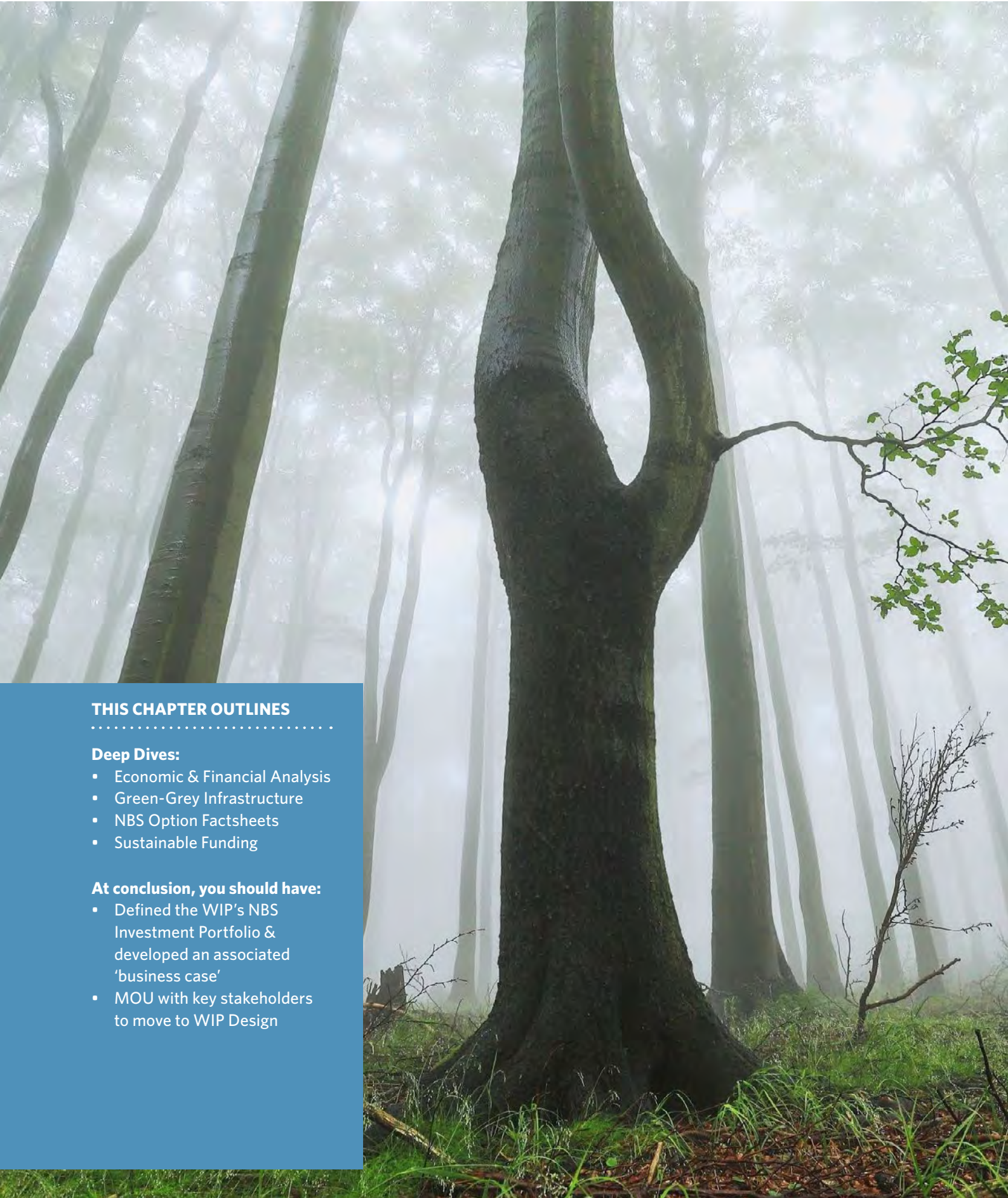


LEFT: © PHOTOGRAPHER / AGENCY; RIGHT: © PHOTOGRAPHER / AGENCY

WCWSS—Theewaterskloof, Berg River and Voëlvelei. The provincial government’s Ecological Infrastructure Investment Framework (EIIF) sets out an agenda for the province and local municipalities of strategic actions to be taken to achieve water resilience. The City of Cape Town as a water service provider is responsible for providing water to its users through managing bulk water and water distribution network. The the City has adopted several water-related policies, including a dedicated water and sanitation policy and a water resources policy (OECD 2021). The former establishes clear goals, duties, resources, and emergency strategies, and is regularly monitored. The latter establishes clear goals, climate resilience aspects, and is regularly monitored, though it does not outline clear duties, nor does it detail resources needed for its implementation. The City’s New Water Strategy (2019) recognizes the importance of catchment restoration as central to future water security and climate resilience.

Despite the governance systems in place, the WCWSS faces issues with policy and institutional fragmentation, inadequate capacity, multi-level and multi-stakeholder coordination. To function and navigate the unclear mandates and limitations, enhancing water security through nature needed a new approach—collective action, prioritization, and public-private partnerships. Moreover, the GCTWF as an independent coordination body provides the platform for collaboration and collective action, manages the work, and champion the process without taking the mandate away from the relevant authorities or duplicate efforts.

The Nature Conservancy fulfilled the role of Secretariat of the GCTWF and obtained a legal opinion to determine whether any legal limitations existed for the City to invest resources outside the municipal boundary for long-term water security. The results of this were communicated with the City of Cape Town. TNC continued working with the City to assess what role they could play in implementing and investing in the program. After multiple engagements, in May 2021 TNC and the City of Cape Town signed an MOU, committing the City to 3 years of funding worth R62 million (USD\$4 million equivalent).



THIS CHAPTER OUTLINES

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Deep Dives:

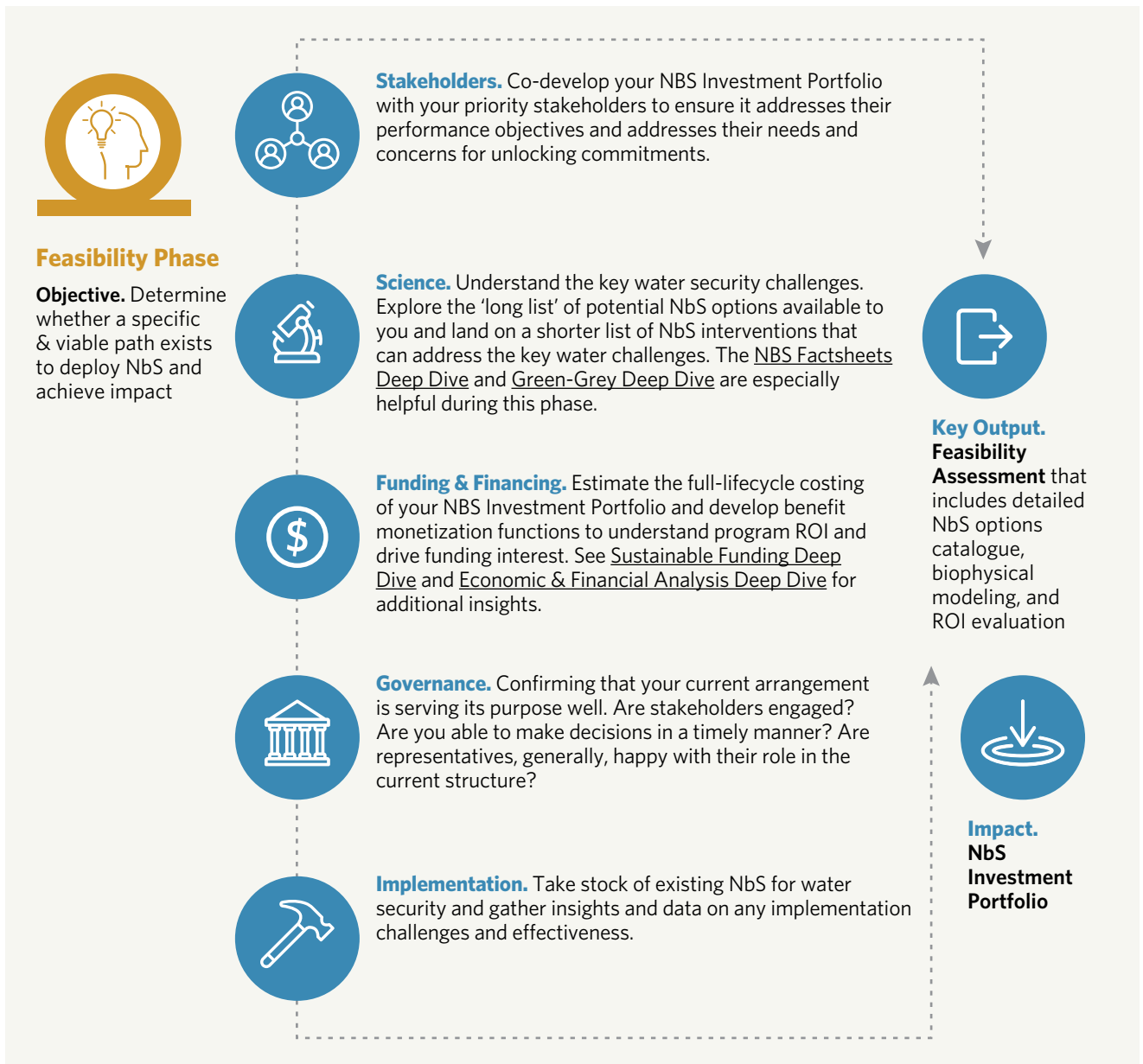
- Economic & Financial Analysis
- Green-Grey Infrastructure
- NBS Option Factsheets
- Sustainable Funding

At conclusion, you should have:

- Defined the WIP's NBS Investment Portfolio & developed an associated 'business case'
- MOU with key stakeholders to move to WIP Design

5.0

Feasibility



The Feasibility phase builds upon, tests, and validates the Theory of Change proposed at the end of the Pre-Feasibility phase. Specifically, Feasibility is designed to test whether a specific viable NBS portfolio exists that can achieve outcomes and attract commitments from your stakeholder group. This phase is supported by detailed scientific technical studies including mapping, hydrological modelling, and prioritization algorithms; such studies confirm the targeted level of ecosystem services as tied to water security, and also can generate estimated co-benefits for values such as biodiversity and carbon outcomes. Furthermore, Feasibility also involves extensive outreach to field practitioners to assemble a detailed understanding of the execution and costing realities for implementation scale-up. When successfully executed, this phase can create a powerful centralized vision for the stakeholder group that allows for a smooth transition into the Design phase, during which the specific governance and financial arrangements are defined in order to operationalize the WIP.

Core Questions to navigate during this phase include:

How do priority NbS options touch down in the local context? The ‘shortlist’ of NbS options prioritized during Pre-Feasibility needs to be contextualized for local conditions. For example, an agroforestry solution in Ecuador has quite a different profile to one that would be successful in Kenya. Therefore, it is important to evaluate the priority NbS list by conducting site visits and interviews with implementers of relevant demonstration projects. Key aspects to focus on include: What does this option specifically entail for this geography? Does literature and/or implementation experience base point to the efficacy and social acceptance of the NbS option in the local context? What are full lifecycle costs and when are those costs incurred? What is the expected time profile for ecosystem services gains associated with this option? What is the local absorption capacity to deliver this NBS solution?

What is the priority NbS portfolio, and what is it worth? A key output from the Feasibility phase is the NbS Investment Portfolio that links a level of ambition (e.g., # of forest hectares restored) with estimated costs and a cost profile (e.g., \$ required over X years to direct and implement forest restoration investments) and a targeted level of ecosystem service gains (Z percent reduced sediment load at point of treatment plant intake). This relationship is evaluated and presented in an ROI Evaluation (also called ‘business case’), which is co-created with the stakeholder group to ensure that results are valuable and credible to motivate them to commitment to engaging further. Importantly, this framing allows for potential funders to understand their associated ROI or cost/benefit profile, which is often a pre-condition for issuing at-scale sustainable funding commitments.

Key outputs in this phase that assist with advancing your WIP include:

- **Feasibility Assessment** that presents your priority NbS Investment Portfolio, projects associated ecosystem services gains and associated water security outcomes, provides full-lifecycle costing, and details cost-effectiveness ratios and/or ROI ratios for target beneficiaries. This evaluation may be supported by a number of sub-activities including the NbS Options Catalogue, biophysical impact modelling, GIS mapping of priority interventions, and financial modelling, all of which serve to enhance the credibility and thoughtfulness of your ‘business case’.
- **Memorandum of Understanding** with your priority stakeholders to move into Design phase. Often times, this MoU articulates an interim governance framework to guide roles and responsibilities during Design phase interactions.




Top Tips to bear in mind during Feasibility:

- **Bring your stakeholders along:** It is essential to co-create the business case with your core stakeholders, and therefore critical elements such as methodology, data inputs, resolution, and benefits monetization assumptions must be tackled in regular interface points along the way.
- **Understand feasibility at field-level:** Program viability is more than technical feasibility (can NbS have a long-term impact?) or investor interest (is it fund-able?); it also means determining if proposed NbS options are deployable in the field and how effective they are. Therefore, conduct outreach early to determine the

true 'current state' of implementation capacity and social acceptance in local communities for your priority NbS options, as viable implementation networks take significant time and effort to develop and can act as a fundamental boundary condition to your program portfolio.

- **Go deep on data and hydrologic modelling:** Now is the time to move from indicative global or national data sets to site-specific analyses using the best available local information. Thoughtful early stakeholder mapping (as outlined in the Stakeholder Mapping Deep Dive) allows may surface technical partners that can provide such data and review analytical results.

Feasibility Assessment

 WHAT IS IT?	 KEY COMPONENTS	 LEVEL OF EFFORT														
<p>The Feasibility Assessment marks the movement from determining high-level NbS potential (Pre-Feasibility) to developing and evaluating the specific NbS Investment Portfolio that is attractive for your stakeholders to advance and commit to. When the Feasibility Assessment is accompanied by a robust and iterative stakeholder engagement process, the result is a solid platform from which to transition into Design phase.</p>	<ol style="list-style-type: none"> I. NbS Options Catalogue: Detailed analysis of your prioritized NbS options tailored to the local context. Important aspects include costs and benefits delivery timeline, workflow mapping, capacity mapping, implementation capacity, and social acceptance. II. Supportive technical products: A variety of mapping and detailed modeling (both biophysical and financial) inputs are required to feed into the Business Case. III. Business Case. Summary narrative document tying together the above inputs to generate a view on overall feasibility and recommend an NBS investment portfolio to take into Design phase. 	<p>Time Required: 6–8 months</p> <p>Key Experts & Working Days (estimate)</p> <table border="0"> <tr> <td>Stakeholder engagement:</td> <td>30</td> </tr> <tr> <td>Project management:</td> <td>30</td> </tr> <tr> <td>Economics & finance:</td> <td>35</td> </tr> <tr> <td>Science management:</td> <td>35</td> </tr> <tr> <td>Hydrologic modelling:</td> <td>40</td> </tr> <tr> <td>GIS & Cartography:</td> <td>40</td> </tr> <tr> <td>Total estimated working days:</td> <td>210</td> </tr> </table>	Stakeholder engagement:	30	Project management:	30	Economics & finance:	35	Science management:	35	Hydrologic modelling:	40	GIS & Cartography:	40	Total estimated working days:	210
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GIS & Cartography:	40															
Total estimated working days:	210															

The core output of the Feasibility Assessment is the Business Case, which is a narrative document that builds upon certain concepts explored during Pre-Feasibility including the water sector context, water security challenges, and the opportunity for NbS to address these challenges and deliver associated co-benefits. However, the Business Case deepens the conversation by evaluating one or more specific NbS Investment Portfolios (also referred to as 'implementation scenarios') to understand full-lifecycle costing, projected water security outcomes, and estimated value of monetized benefits, which together form the inputs necessary to generate Return on Investment and cost-benefit ratio projections. Usually, a Business Case proposes a specific implementation scenario recommendation which is arrived via dialogue with stakeholders and may be framed according to policy goals, performance delivery objectives, or prioritization routines against available budget. For further guidance on business case generation please see the [Economic & Financial Analysis Deep Dive](#).

Business Case development is quite interdisciplinary and should be supported by adequate project management capacity to ensure the scientific, financial, and stakeholder engagement processes remain appropriately

connected. Furthermore, it is sometimes wise to develop a Decision Support System platform as an interim step in the Business Case development process. Such platforms provide stakeholders with context to explore technical outputs, weigh trade-offs among different scenarios, and promote dialogue within their respective institutions, with the overall aim of empowering stakeholders to take a confident and appropriate decision to select the WIP's NbS Investment Portfolio.

5.1 Analytical Workstreams

5.1.1 FEASIBILITY: STAKEHOLDER ENGAGEMENT

A key Feasibility outcome is to refine and iterate upon the indicative Theory of Change (produced at conclusion of Pre-Feasibility) and generate a specific, compelling and validated NbS Investment Portfolio that has been co-created alongside your priority stakeholders. Important stakeholder engagement items to consider during this phase includes:

Scope social buy-in for proposed NbS interventions: An important enabling condition that informs your WIP's feasibility is: is there social acceptance for the proposed NbS options? If an NbS option requires upstream communities to host, implement, and/or maintain the practice, then careful consultation must be conducted with such communities to validate their prospective interest in potential WIP participation and the roles, responsibilities, and incentive arrangements that will drive and organise their participation. Furthermore, it is important to understand if the NbS practice will lead to genuine additionality in watershed health, or whether the practices will simply shift behaviours to a different part of the watershed. This aspect of social acceptance is considered in the 'NbS Options Catalogue' component of the Feasibility Assessment. Relatedly, the NbS Options Catalogue also explores what the absorption capacity is for upscaling implementation for each of the NbS practices, which helps inform if capacity-building efforts are required or if NbS portfolio feasibility is unrealistic from a near-term 'implementation delivery' perspective.

Validate funders' needs & concerns: The business case component of the Feasibility Assessment is a purpose-built narrative to help stakeholders transform interest into commitments by providing science-based evidence alongside relationship trust-building. To make this business case as compelling as possible, it is imperative at the beginning of Feasibility to be aligned with stakeholders on the specific needs they are facing, what level of detail they require, and what specific metrics they need outputs in to maximize relevancy of business case results to their internal constituents. Many stakeholders have distinctions between leadership/management personnel and technical counterparts; a good strategy in these instances is to develop a two-track stakeholder engagement system where leadership/management agrees to the overall process at phase beginning, and then interim analyses and outputs are co-generated with their technical staff. This helps ensure that the business case is framed correctly to meet internal needs, references the right data sets, and is viewed with confidence by leadership/management personnel with decision-making capabilities.

Co-create priority NbS Investment portfolio: Oftentimes WIPs are tasked with achieving multiple objectives, particularly where multiple water security and co-benefit types are being considered. As a result, weighing trade-offs between alternative scenarios is often more relevant than considering a single optimized scenario against cost-benefit criteria. The analytical products generated during Feasibility will likely require your stakeholder group to choose among multiple scenario options. Therefore developing appropriate facilitation forums to determine the WIP's priority NbS investment portfolio is essential so it has a strong 'north star' to guide Design phase related questions such as governance and financial structuring. It may be appropriate to accompany the technical products with a Decision Support System and/or 'serious game' to explore data and scenarios and allow stakeholders to provide informed feedback.

5.1.2 FEASIBILITY: SCIENCE

As part of Pre-Feasibility, your WIP will have identified the target water security challenge(s) and selected possible NbS to address your issue. In Feasibility you will assess the suitability, viability and sustainability of your selected NbS in order to ensure that the NbS Investment Portfolio you are proposing will be successful. In order to do so, you will need to assess your NbS portfolio from the standpoints of technical, legal, financial and implementation suitability.

Technical Studies

Feasibility includes a deeper exploration of your NbS options through relevant technical studies, which usually include:

- Developing GIS-based maps
- Biophysical studies
- Predicted future land use/land cover (LULC)
- Portfolio prioritization/optimization routines
- Socio-economic surveys
- Interviews with field-level practitioners
- Financial modelling

The methodology to develop your NbS Investment Portfolio and evaluate associated ROI/cost-benefit is presented in Figure 13 and is further detailed in the Economic & Financial Analysis Deep Dive.

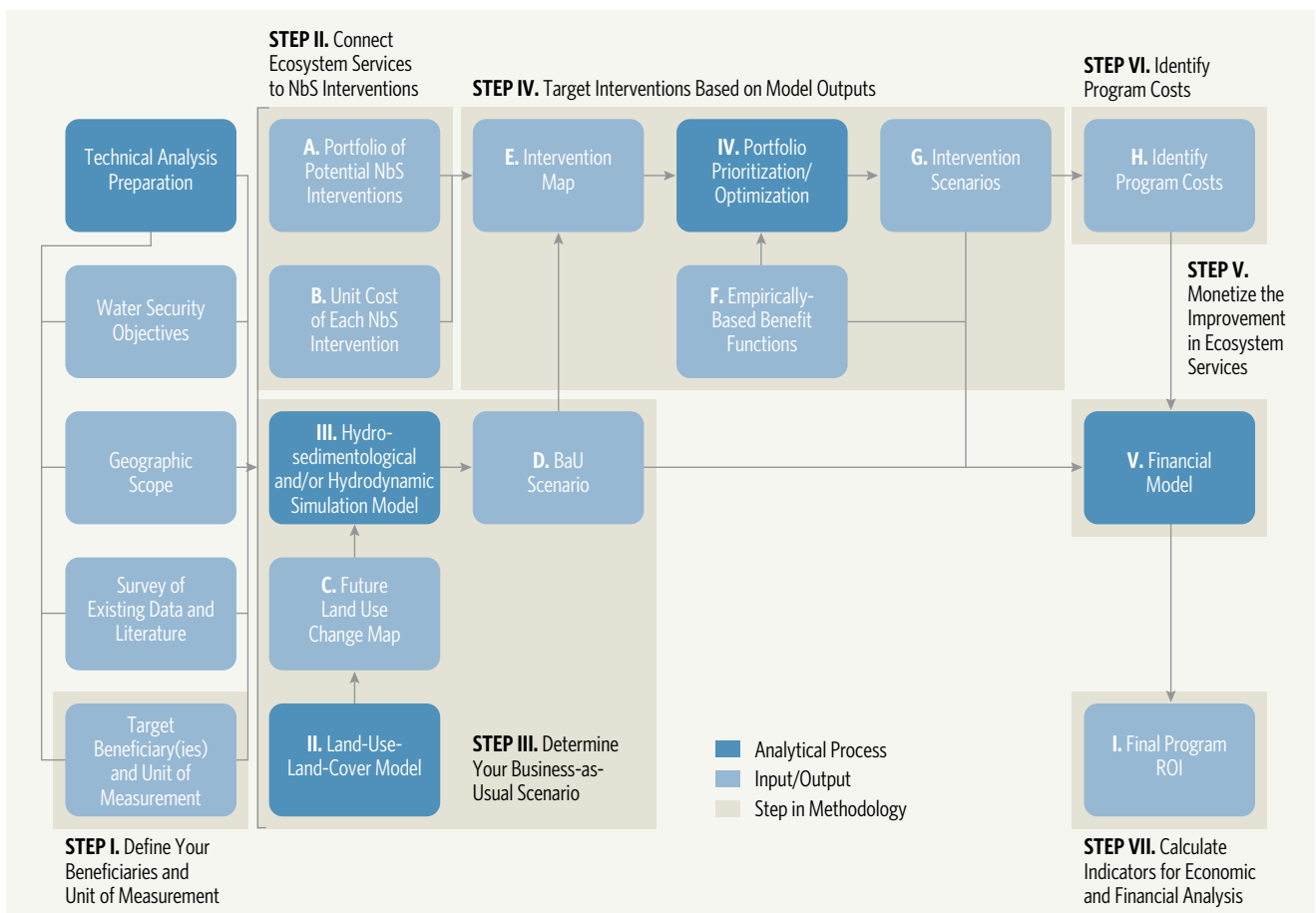


FIGURE 13. NbS Investment Portfolio Evaluation Flow Diagram

Nature-based Solutions Benefits and Trade-Offs

One of the key advantages of nature-based solutions (NbS) over grey solutions is their potential to deliver on multiple benefits. NbS may be designed for one or more outcomes, but there is usually a primary challenge that the intervention is meant to address. The additional benefits that the intervention may deliver on are often called co-benefits, since they are secondary to the primary benefits that stakeholders, project developers or funders are most interested in. This guide focuses on water security outcomes as the primary benefit(s) of NbS, but it is important to understand the range of other benefits that these water-focused NbS can deliver on, especially if these co-benefits can be considered in the financial assessment of the NbS portfolio or can be helpful in gaining buy-in from specific stakeholders.

Equally, if not more important, potential trade-offs should be taken into account when considering investment in specific NbS. Trade-offs are the negative aspects of a given intervention or suite of interventions, including negative impacts, the non-delivery of a benefit of interest or some other aspect of the solution set that is undesirable. Essentially a trade-off is what you are willing to give up or accept with the implementation of a particular intervention or project. Further guidance is available in the Co-Benefits and Trade-Offs Deep Dive. Identifying trade-offs during Feasibility is critical to inform whether to exclude a particular NbS or if there are additional financial considerations or mitigation actions needed to address the trade-offs.

5.1.3 FEASIBILITY: FINANCE

Financial sustainability for your WIP requires understanding how the WIP's overall cost profile can be met by one or more funding sources. Complicating matters is that the principle of 'adaptive management'—which best-practice WIPs aspire to—allows for NbS portfolios to be refined as program implementation progresses and additional data are generated. However, such a dynamic view of NbS portfolio management also implies an ongoing 'balancing act' of costs and funding sources as opposed to a one-off evaluation of program financial sustainability.

Costing. During Feasibility it is necessary to estimate the full-lifecycle costing profile for your WIP's NbS Investment Portfolio, which projects costs (usually on an annual basis) over the WIP's useful life (often estimated over a 30-year timeframe). Such time-delineated costs are a key input to metrics such as Net Present Value and Return on Investment which address the time value of money. Note that NbS intervention costs may vary considerably across your service area; e.g., landowner incentives required to promote behaviour change in one part of a basin may be significantly different in other parts of the basin.

TABLE 5-1. WIP Costing Categories for NbS interventions and program management

NbS Intervention Cost Categories				Program Costs
Implementation Cost	Maintenance Cost	Opportunity Cost	Transaction Cost	
<ul style="list-style-type: none"> Refers to initial site-level direct implementation costs (i.e., “CAPEX”) including categories such as site-level design, permits, materials, equipment, and labour For example, initial tree installation would fall under this category, but subsequent tree replacement would be considered a maintenance cost under the next category 	<ul style="list-style-type: none"> These costs are to maintain the value of the WIP’s NbS investments and ensure compliance over the long-term investment lifecycle. This includes costs associated with regular inspection, maintenance and replacement efforts, and site-level monitoring Maintenance costs are typically variable and recurrent, with the time interval dependent upon the intervention. For example, replacing signage or fencing could occur a few times, versus monitoring which is usually more frequent (at least annual) 	<ul style="list-style-type: none"> Opportunity costs reference the difference between the net benefits (e.g., profits) landowners realize under business-as-usual land management and under the NbS Investment Portfolio Typically, landowners need to be compensated to absorb opportunity costs. Note that such compensation can vary considerably and may take the form of direct financial support or in-kind incentives 	<ul style="list-style-type: none"> Transaction costs are those incurred to organize NbS investments rather than direct costs associated with executing the investments Costs could include items such as fuel, stakeholder outreach efforts, dispute resolution, and training Transaction costs are variable over time, may occur in regular or irregular intervals, and are highly activity-dependent 	<ul style="list-style-type: none"> These are the core programmatic costs (usually tilted more ‘fixed’ than ‘variable’) associated with WIP management Personnel capacity to consider in program cost estimation include program direction, monitoring & evaluation, implementation coordination, and finance & operations. Additional cost line items include office rent, insurance, vehicles, & tele-communications

Funding. The business case provides a platform to agree with stakeholders on the overall opportunity for NbS to generate water security outcomes. To increase the chances of the business case triggering funding commitments, it is important to validate key methodological aspects with your stakeholders, including matching their required ‘burden of proof’ and mutually agreeing upon functions to appropriately monetize ecosystem services gains.

Burden of Proof: A general expression of interest is usually a necessary—but insufficient—condition that often needs to be paired with specific technical evidence for unlocking WIP funding commitments. Therefore, prior to commencing the Feasibility Assessment, it is important to validate with your key stakeholders what the appropriate ‘burden of proof’ is for motivating their institutional commitment. At a minimum, this implies understanding the specific water security benefit metrics in which results need to be provided, however it also requires aligning around specific biophysical models to be used in the analysis (preference is typically to rely on models that are already internally relied upon & trusted by the beneficiary). A good practice is to prepare an overall technical methodology at the start of your Feasibility Assessment and have this formally reviewed and evaluated by technical counterparties within your prospective funders to ensure it meets their needs. For further detail on Burden of Proof—including the three ‘umbrella typologies’ that are generally seen in practice (benefit outcomes estimation, cost-effectiveness/ROI, and crediting/offset methodologies) please refer to the [Sustainable Funding Deep Dive](#).

Benefit Monetization Functions: Moving beyond benefit-cost ratios to generate program ROI requires estimating the monetized value of ecosystem services gains associated with your NbS Investment Portfolio. The three principal

methods for doing so include empirical benefit functions, alternative cost approaches, and willingness to pay. These items are also explored further in the [Sustainable Funding Deep Dive](#).

Given the public-private nature of many WIPs, it is often appropriate to conduct valuation exercises of broader public benefits to highlight the additional value-add of NbS versus traditional grey alternatives. For example, many NbS options feature improved agricultural best management practices that not only deliver water security benefits but also improve smallholder farm income; this can be included as part of the overall program ROI and may be motivating to certain funding agents.

5.1.4 FEASIBILITY: GOVERNANCE

During Feasibility, the most important governance aspect is confirming that your current arrangement is serving its purpose well. Are stakeholders engaged? Are you able to make decisions in a timely manner? Are representatives, generally, happy with their role in the current structure? If the current structure is functioning well, move forward to Design with confidence. If the current structure could use some improvements, review the Common Governance Models sub-section below and make note of any models that might better meet your needs. The Design phase presents an opportunity to make any changes.

5.1.5 FEASIBILITY: IMPLEMENTATION

The NbS Investment Portfolio should indicate total implementation volume / level of effort for each of the priority NBS options (e.g., # of hectares of forest restoration). Meanwhile, the NbS Options Catalogue component of the Feasibility Assessment provides valuable insights for unit labour requirements for each of the NbS types and the social acceptance of these measures. To analyse implementation at the Feasibility level, a simple analysis should be conducted at the conclusion of the business case comparing the estimated labour requirements for implementation to currently available on-the-ground absorption capacity. If there are significant gaps between available implementation capacity and the level of effort associated with the NbS Investment Portfolio, plans must be drawn up during the Design phase to define how to capacitate the necessary workforce. By way of example, Figure 14 provides the estimated requirement implementation workforce requirement for the GCTWF's 2018 business case; this indicates that approximately 350 green jobs are required for the GCTWF's first six years during the 'high impact' execution phase.

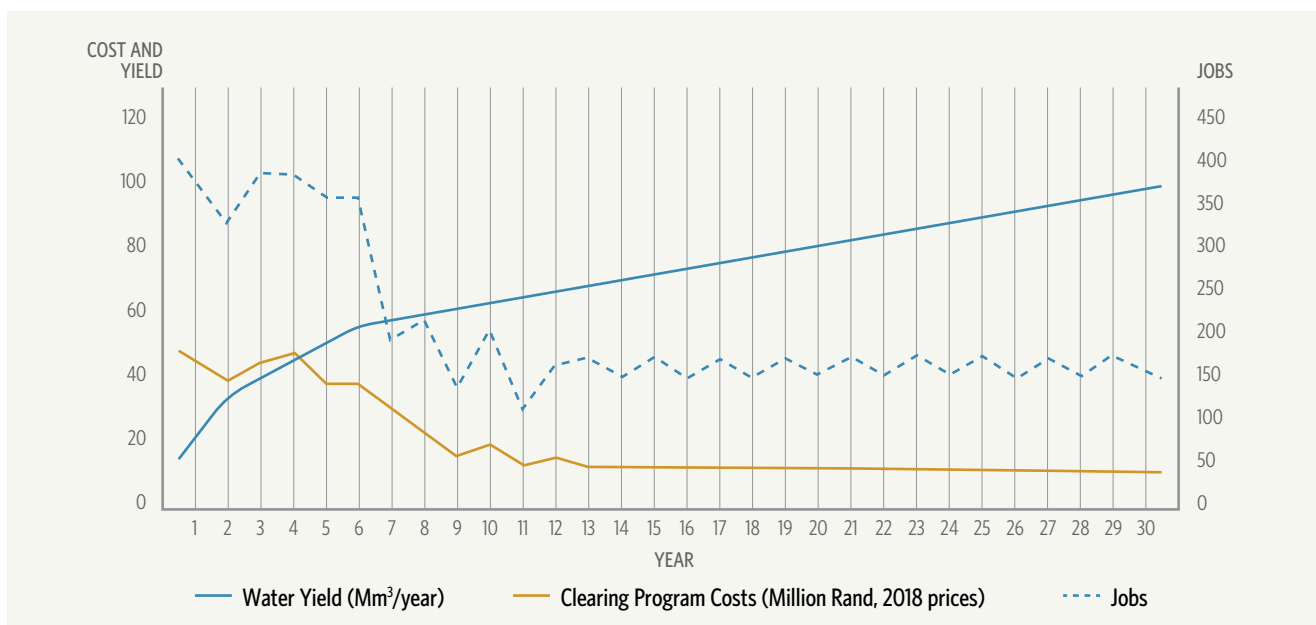


FIGURE 14. Timeline of GCTWF Annual Costs, Yield Benefits, and Jobs

5.2 Understanding & Planning for Impact

The Feasibility Phase marks the movement from indicative Theory of Change to the defined NbS Investment Portfolio that will subsequently be structured from governance and financial perspectives during Design Phase. Specifically, the NbS Investment Portfolio include an initial set of objectives that indicate an overall level of effort (e.g., ‘55k ha of invasive plants cleared’), ideally in a spatially prioritized manner (e.g., ‘in seven priority of 25 total sub catchments’), and an estimated level of water security outcomes and associated co-benefits (e.g., ‘55 Mm³/yr and 350 green job opportunities’). See Figure 15 for further detail on the linkages between phases for developing overall WIP SMART Objectives.

In preparation for development in subsequent phases of a monitoring and evaluation program to track success WIP over time, an initial set of key metrics should be established during the Feasibility phase based on the outcomes and impacts that the WIP will deliver on. This set of metrics will help guide elements of the Design phase, including the development of SMART objectives and the design of the monitoring and evaluation program. Key metrics should include measures that assess the program’s success in addressing the core water security challenge(s) and delivering on co-benefits, as well as metrics related to sustainable financing, governance, implementation and any metrics that help inform whether potential negative impacts are being avoided or mitigated.

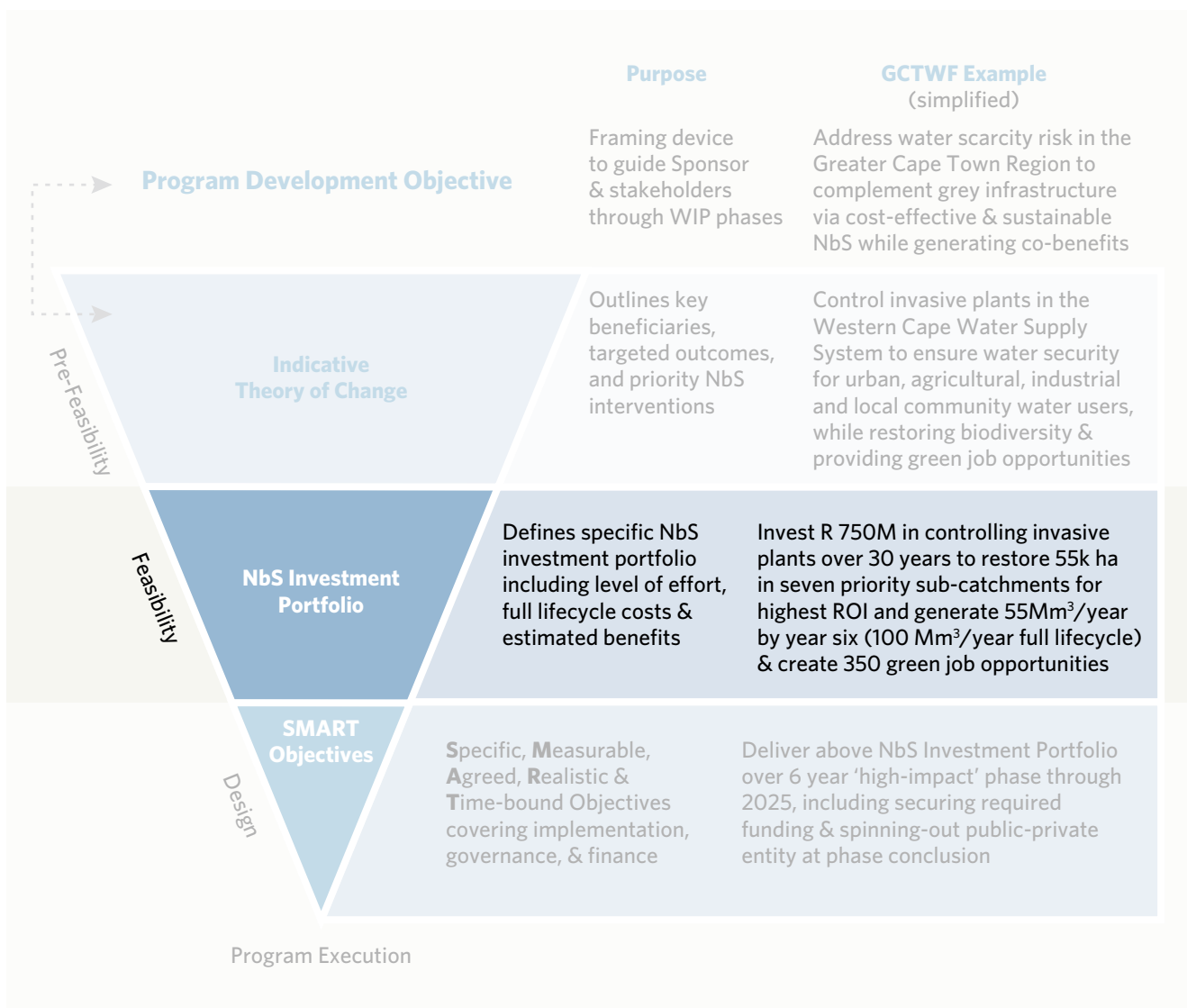


FIGURE 15. SMART Objectives Development Diagram by Phase featuring GCTWF Example (Feasibility Phase highlight)

THE GREATER CAPE TOWN WATER FUND

What is the absorption capacity, social acceptance, and costs & benefits profile for priority NbS options?

The main nature-based threat to water security in the region is alien trees invading the catchments. Analysis for the Business Case modelled a 30-year period, and a six-step process was followed to identify priority source water sub-catchments for invasive alien plant removal and to understand the return on investment associated with implementing these interventions at scale. Seven of twenty-five sub-catchments were identified as priorities for invasive alien plant removal based on return on investment. They comprise a total of 54,300 hectares and are the sub-catchments for Wemmershoek, Theewaterskloof, and Berg River dams.

Results from the Business Case showed that an investment of R372 million (NPV) (\$25.5 million USD) would generate annual water gains of over 55 billion litres (55 Mm³) a year within six years compared to the business-as-usual scenario. This is equivalent to one-sixth of the City’s current supply needs and would increase to 100 billion litres (100 Mm³) a year within 30 years. Water gains are at least one-tenth the weighted unit cost of alternative supply options (Figure 16). Approximately 350 job opportunities would be created in the first five years of implementation, as removing alien plant invasions is very labour intensive. The effective communication of these messages, by bringing together the data from the water modelling and ROI analysis into clear, lay-person, messages, enhanced the social acceptance of the priority NbS options.

Experts and practitioners were approached to validate the findings of the Business Case. This involved multiple expert workshops and reviews which helped with credibility of the business case study and findings. Finally, the business case was shared with the GCTWF steering committee for input. The findings were shared to a larger public and private stakeholder group during Business Case’s launch and panel discussion in November 2018, with the City of Cape Town announcing its support to NbS as part of its broader portfolio of options to address Cape Town’s future water security.

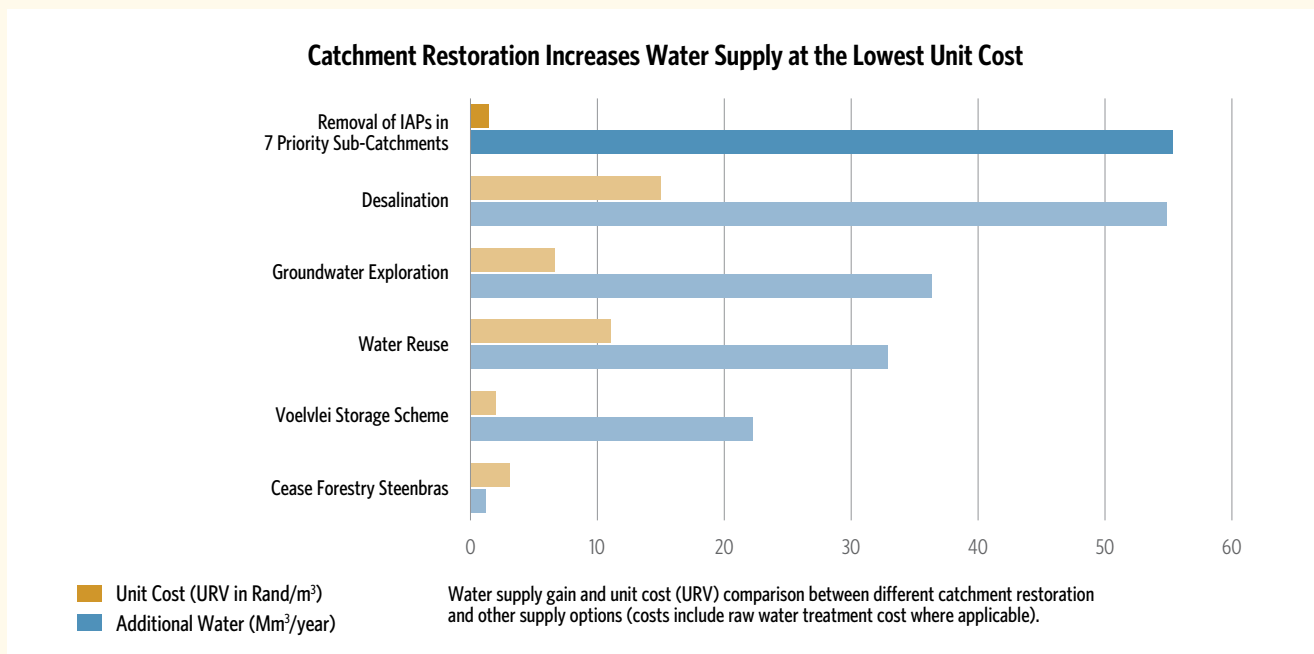


FIGURE 16: GCTWF Cost Comparison of IAP control vs grey infrastructure to augment water

How were private sector funders approached?

The GCTWF identified the top ten water users, the list of which included food and beverage companies, hospitals, sport fields and others. The sustainability managers of the corporates were identified, approached, and shown the Water Fund concept. Initially, the objective was to mobilize private sector interest, buy-in, and participation in the GCTWF, and create a vision for it, rather than immediately seeking financial backing. Corporates were presented with the scientific modelling and cost-benefit analysis of the NbS and became interested in supporting the GCTWF as they could see the benefits. By avoiding immediately asking for funding, and letting corporates see for themselves the benefit of the program, the private organizations' interest in the program was genuine. Many have offered support to the program, either in the form of funding, in-kind contributions or in terms of endorsement.

What is the target implementation scenario, and do funders find it attractive?

The GCTWF has a target implementation scenario of clearing 54 300 ha across seven priority sub-catchments by 2025 to generate annual water gains of over 55 billion litres (55 Mm³) a year at an average Unit Reference (URV) of R2.20 per m³. To meet this target, the GCTWF has to clear approximately 9,050 new hectares a year, while undertaking scheduled follow-up and maintenance work on cleared areas.

The optimal clearing scenario can only be achieved if there is appropriate number of trained Specialized Rope Access Technicians (SRAT) available to conduct the clearing in remote mountainous areas. A total workforce of 350 would be required to meet the targets and the GCTWF are working to train the required minimum of 120 SRAT, creating new specialised green job opportunities in the process.

The potential water gains from the clearing and the creation of job opportunities presented an attractive cost-benefit ratio for funders. The Coca-Cola Company provided the first corporate seed funding for implementation, and this was used to appoint a group of female clearing personnel for the Atlantis Aquifer. Since 2018, 475 green job opportunities have been created with the support of corporates, philanthropy, Working for Water and the City of Cape Town. This proof of concept and alignment with Environmental Social & Governance criteria has inspired private sector involvement.



THIS CHAPTER OUTLINES

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Deep Dives:

- Governance
- M&E Program Design
- Sustainable Funding

At conclusion, you should have:

- Finalized SMART Objectives
- Secured funding commitments
- Go/no-go decision to launch your WIP

6.0 Design



Design

Objective. Pull together proposed actions into an actionable program



Stakeholders. Crystallize Program Vision via SMART Objectives, agree upon the financial and governance structure for executing this vision, and secure sustainable funding commitments to start delivering results.



Science. Reflect upon the SMART Objectives to define the 5-year implementation plan and supportive M&E program including KPI targets and baseline information collection needs. Additional information available in the M&E Program Design Deep Dive.



Funding & Financing. Develop the WIP's sustainable funding strategy to ensure that funding commitments are able to meet full-lifecycle program costs and that clear actionable hypotheses exist for addressing gaps. See Sustainable Funding Deep Dive for further information.



Governance. During this phase you will select the governance arrangement for your WIP, including (as relevant) developing a dedicated legal structure to house implementation efforts. This is further unpacked in the [Governance Deep Dive](#).



Implementation. As part of the 5-year implementation plan, you will consider the overall operational arrangement (in-house staffing versus contracted agents) to execute on-the-ground implementation efforts and elaborate associated capacity building and training requirements.



Key Output.
Strategic Plan
capturing SMART Objectives that is aligned against validated financial, governance and operational structure



Impact.
SMART Objectives tied to M&E Program Framework

The purpose of the Design phase is to transform the NbS Investment Portfolio originated during Feasibility into a crystallized set of SMART Objectives that are delivered by the WIP during Execution phase. Relatedly, the Design phase articulates the WIP's financial, operational and governance profile to achieve the NbS Investment Portfolio, each of which are elements that are elaborated and included in the Strategic Plan. At the end of this phase, the WIP leadership, stakeholder group, and associated implementation parties should be aligned around a well-structured program with clear associated governance and financing arrangements for program success. Critically, this phase involves transforming stakeholder interest into specific resource commitments (either direct- or in-kind) to ensure that the WIP has firm financial footing to begin carrying out its implementation agenda.

From a timing perspective, Feasibility and Design phases may overlap rather than follow in a pure sequential format (e.g. aspects of Design often begin halfway through Feasibility). Such 'staggering' is sometimes a relevant way to maximize stakeholder momentum and political enabling conditions.

Core Questions to address during Design phase include:

What is the WIP's Program Vision and associated concrete technical objectives? The NbS Investment Portfolio identified in the business case should be reflected upon by your stakeholder group and crystallized into an investment program that meets SMART objectives (Specific, Measurable, Agreed, Realistic, and Time-bound). While 'specific' and 'measurable' aspects are may clearly defined in the NbS Investment Portfolio and the Strategic Plan, aspects such as 'agreed', 'realistic' and 'time-bound' require significant additional stakeholder consultation. See Impact section for further detail.

What are the financial, governance & implementation arrangements to achieve those objectives? The specific structuring profile for WIPs can vary tremendously as influenced by the sponsor type, stakeholder group makeup, collective action requirements, and institutional context. Particularly complex topics include financial sustainability evaluation, governance arrangements, and implementation strategy, all of which must be conceptualized in a holistic manner (see Strategic Plan output) to maximize the likelihood of WIP success.

Which stakeholder(s) will commit to funding the WIP? Assuming a promising business case that has been co-created with one or more potential WIP investors, the Design phase involves moving from funders expressing an interest into making specific funding commitments for realizing the WIP's implementation objectives.




Key Outputs in this phase include:

- The Strategic Plan is a shared roadmap developed with your stakeholder group which will serve as a guide to WIP leadership during Execution Phase. This document connects the SMART Objectives to a set of interrelated aspects including a five-year implementation plan, sustainable funding plan, governance recommendation, monitoring & evaluation program framework, and the mapping of potential risks and mitigation mechanisms. See breakout section below for additional detail.
- Secure sustainable funding commitments with donors and investors to finance costs associated with WIP execution including initial creation costs and subsequent program management and implementation requirements.
- Pilot interventions may be relevant to execute during this phase. Such investments may be used to de-risk NbS options with limited existing field presence such as clarifying cost profiles, social acceptance, and execution workflow needs. Furthermore, such pilots often serve to 'bring to life' the NbS options to stakeholders, test the outcome of these solutions in local real-life situations and excite them with the prospect of joining.
- Secure permits: Obtaining work authorization to conduct field implementation can require significant time and should be immediately prioritized as relevant to NbS field implementation requirements.

Top Tips to bear in mind during Design:

- **Develop crisp communication talking points:** The business case indicates the estimated program costs, water security outcomes and co-benefits associated with your WIP. These and other key talking points should be developed as part of communication efforts to maximize WIP political support.
- **Rely on your Champion(s):** Champions can provide an invaluable role during this phase of conducting back-channel discussions with other stakeholders to understand their institutional realities for partnering in the WIP.
- **Go deep with potential funders on what is required to execute funding agreements:** Funding agents often have internal roadblocks (e.g., ability to only invest in certain parts of a service area; unclear legal mandate to fund watershed investments). Special care should be made to understand such limitations and reflect as part of the sustainable funding plan.
- **Set realistic expectations:** It is important for WIPs to build on success rather than set lofty expectations that are immediately missed. Be realistic with your immediate execution and operational ambitions to maintain the confidence and trust of your stakeholder group.

The Strategic Plan

 WHAT IS IT?	 KEY COMPONENTS	 LEVEL OF EFFORT												
<p>The Strategic Plan is a shared roadmap with stakeholders that WIP leadership relies upon for delivering results during Execution phase. The aim is to provide clarity and focus on the required funding, operations, governance, and M&E components that need to be holistically considered and integrated. The Strategic Plan should take a long-term framing perspective and be revisited regularly on an iterative basis (e.g. on a 3-year basis) to reflect adaptive management principles and ensure fitness against the WIP's SMART Objectives.</p>	<ol style="list-style-type: none"> I. Program vision: Clearly articulates the WIP's SMART objectives which act as framing device for rest of Strategic Plan II. Five-year implementation plan: Defines the near/medium-term level of implementation effort and the operational delivery strategy III. Sustainable funding strategy: Compares in-hand funding commitments to total program costs and evaluates potential sources for curing gaps IV. Governance recommendation: Evaluates options and suggests specific arrangement to maximize likelihood of WIP success V. Monitoring & Evaluation framework: Outlines proposed methodology, key performance indicators, and baseline data collection efforts VI. Risk & mitigants mapping: Summarizes key risks threatening WIP execution and suggests potential mitigating measures 	<p>Time Required: 7-10 months</p> <p>Key Experts & Working Days (estimate)</p> <table border="0"> <tr> <td>Stakeholder engagement:</td> <td style="text-align: right;">50</td> </tr> <tr> <td>Project management:</td> <td style="text-align: right;">40</td> </tr> <tr> <td>Economics & finance:</td> <td style="text-align: right;">20</td> </tr> <tr> <td>Science management:</td> <td style="text-align: right;">30</td> </tr> <tr> <td>Legal & governance:</td> <td style="text-align: right;">15</td> </tr> <tr> <td>Total estimated working days:</td> <td style="text-align: right;">155</td> </tr> </table>	Stakeholder engagement:	50	Project management:	40	Economics & finance:	20	Science management:	30	Legal & governance:	15	Total estimated working days:	155
Stakeholder engagement:	50													
Project management:	40													
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Science management:	30													
Legal & governance:	15													
Total estimated working days:	155													

The Strategic Plan is important for firmly setting the WIP's overall vision and proposed operationalization approach, and is the key document you will rely upon in Execution phase to guide program implementation. This output provides clarity on how various structuring aspects connect with one another, creating specific guideposts for subsequent WIP management to execute against and partners to rally behind. When done thoughtfully, the Strategic Plan affords a unique opportunity to generate significant stakeholder momentum and can lead to aligned funding commitments by WIP beneficiaries.

6.1 Analytical Workstreams

6.1.1 DESIGN: STAKEHOLDER ENGAGEMENT

The Design phase is a remarkably interdisciplinary period during which multiple workstreams need to be thoughtfully built out while still retaining a holistic integrity. The specific stakeholder engagement requirements are therefore detailed in the workstream sub-sections, however as a general principle it is often appropriate to develop specific technical sub-committees to address areas such as Financial Sustainability, Governance, and Operations planning to develop a relevant structure for channelling expert guidance while maintaining overall cohesion at your steering committee level.

Secondly, during Design it may be appropriate to shift the role of Sponsor to the permanent leadership for WIP management. This may or not be the same party/person, but it is important to recognize that the qualities for rallying a set of stakeholders towards launching the WIP may be different than the leadership required for long-term stewardship. Either way, it is important to ensure that the party charged with advancing the WIP is sufficiently capacitated (and ideally fully dedicated) to advancing through Design and beginning Execution phase given increasing work requirements.

6.1.2 DESIGN: SCIENCE

Significant heavy lifting in the Science workstream is completed in Pre-Feasibility and Feasibility phases. However, additional information gathering, scenario development and modelling are required in Design to refine the NbS Investment Portfolio to assemble the final set of SMART Objectives based on real budget availability. Furthermore, a key aspect of the Strategic Plan is the development of a monitoring and evaluation (M&E) framework, which should outline the proposed methodology, key performance indicators, and baseline data collection needs to ensure success. The M&E program should also be costed so that funding needs for M&E are appropriately secured prior to Execution Phase. Lastly, if pilot implementation is taking place during this phase, data should be collected to help further inform the NbS portfolio and more extensive monitoring and evaluation that will take place during Execution.

6.1.3 DESIGN: FINANCING

The Sustainable funding strategy component of the overall strategic plan is meant to match up your WIP's funding sources against the overall full-lifecycle cost needs to execute your NbS Investment Portfolio. As articulated in the [Sustainable Funding Deep Dive](#), the associated steps include:

STEP 1: Engage existing core stakeholders to understand (1) their own planned commitments to the NbS Investment Portfolio, (2) guidance on what their priorities are in terms of the overall funding mix and what it needs to accomplish, and (3) their insights into additional parties that might be 'crowded in'.

STEP 2: Determine your funding gap by comparing full-lifecycle costs and existing committed/in-hand resources to generate the ‘funding gap’ that needs to be addressed. Note that certain funders may have restrictions—e.g., only allowing investment within a certain part of your target service area, or only on certain kinds of expenses—and therefore this gap analysis is usually a dynamic exercise rather than a simple accounting exercise of sources against uses.

STEP 3: Circle back and revisit the core beneficiaries of your WIP. By reviewing the portfolio results generated during Feasibility and carefully reflecting upon other potential catchment beneficiaries, it is possible to re-purpose existing analytics to drive new conversations, especially if there is existing stakeholder momentum for your WIP. Develop a list of specific prospects and prioritize outreach accordingly; this process often requires leaning on your Champions and local water management experts for adequate guidance.

STEP 4: Validate stakeholder interest and clear roadblocks. Sometimes this may entail a change in regulation or legal clearance to allow the funding agent to make green infrastructure commitments or invest beyond existing jurisdictional boundaries.

STEP 5: Secure funding agreements. This may take the form of various mobilization instruments—including grant agreements, transfer contracts, and performance contracts—and may feature ‘one-time’ or recurrent payments.

STEP 6: Develop an achievable plan to infill against remaining funding gaps. The overarching goal from this process is to determine the overall fiscal viability of the WIP, i.e., to be confident before launch that the WIP will be able to successfully resource its medium- and long-term funding needs. Note that WIs, especially collective action vehicles, often don’t have 100 percent of required funds in-hand before starting—which can be appropriate for adaptively managed portfolios—but it is important to have sufficient cash-on-hand (e.g., at least two years) to make meaningful progress towards implementation goals.

STEP 7 (optional): Consider whether the tools of an endowment and/or repayable financing serve to advance WIP outcomes. In certain cases, these additional tools can advance your WIP by providing recurrent funding, accelerating conservation outcomes, and managing risk among WIP funders. An essential pre-condition for both tools is raising the required capital and, in the case of repayable finance, identifying relevant creditworthy cashflows that can serve to pay back principal and interest expenses over time. For further details see the [Sustainable Funding Deep Dive](#).

6.1.4 DESIGN: GOVERNANCE

The purpose of Design is to develop a WIP structure that can successfully execute the Strategic Plan with the secured funding commitments & associated in-kind resources crowded in by aligned partners. It’s highly recommended to review the [Sustainable Funding Deep Dive](#) before continuing to the remainder of this section. You will be unable to construct your final governance arrangements without understanding the types of funding your WIP will be targeting and how you plan to reach financial sustainability.

As noted previously, some WIPs choose to continue their current governance arrangement until after they have a few years of experience in Execution. This section will help the reader figure out whether they should adjust their current arrangement or continue as is for now.

Strategic plan

Informing the Governance Recommendation section in the WIP’s Strategic Plan is a series of in-depth stakeholder engagements and consultations. Follow the below steps to learn more about the overall process for developing your WIP’s governance arrangement, which are explored further in the [Governance Deep Dive](#).

FIRST. Identify your WIP's value proposition. Define its vision, Theory of Change, geographic scope, proposed investment portfolio, and how it currently operates. Based on these considerations, get stakeholder input on what functions they would like to see the WIP initiate, continue, or conclude (e.g., monitoring & evaluation, technical support, implementation coordination, fundraising, etc.).

SECOND. Determine what features will best enable these functions. Defining which features matter most to stakeholders will inform which governance model the WIP should adopt to ensure sustainability into the future. Features may include agility, simplicity, transparency, etc.

THIRD. Consider your current and potential funding flows. The governance structure of the WIP will also be influenced by the types of funding it receives. Review your findings from the analysis from the [Sustainable Funding Deep Dive](#) and ensure that your WIP's design will allow for the right funding to flow through the institution.

FOURTH. Assess potential governance models against the desired functions, features, and funding flows identified. Through a series of qualitative interviews, workshops and meetings, collect stakeholder input on how each of the governance models might serve the desired functions, features, and funding flows identified. You should document the advantages and challenges each model would present, which may entail:

- Cost-effectiveness benefits, including low overhead, or lead to economies of scale
- Access to an organization's pool of expertise or capacity
- Quick procurement processes for implementation, which could speed impact
- Embedding within a particular institution might discourage collaboration, or the WIP might be vulnerable to changes in leadership or priorities within the organization
- Perception as a foreign entity
- Competitiveness with other similar organizations
- Ability to transact with funding providers (e.g., government counterparties)

FIFTH. Detail how your governance arrangements will operate. Once you have chosen your leading governance arrangement, you will need to define how your WIP will operate, which entails who or which entities are responsible for doing what including raising funds, making investment decisions, implementing, hiring and onboarding new staff, etc. The questions to consider will depend on your context.

6.1.5 DESIGN: IMPLEMENTATION

How will your WIP organize implementation efforts? The majority of WIPs rely on in-house personnel to define workplans and develop relationships with external contractors that conduct implementation (e.g., the GCTWF relies on a broad set of contracting partners to clear alien invasive plants and follow up to avoid re-invasion). This means that the WIP takes the form of coordinator, while implementation is done collectively by partners. However, some WIPs instead capacitate implementation in-house (e.g., the Quito Water Fund has a staff of cowboys to ensure that loose cattle do not trample sensitive paramo environments).

Whichever approach is taken, strong coordination, commitment from partners and M&E framework is required. During Design, it is important to reflect on the initial five-year implementation and understand what the implied workforce requirements are for effective execution. This planning may require developing capacity-building programs to appropriately upskill labour to meet implementation needs; for example, the GCTWF needed to develop additional high-angle teams capable of rappelling on steep slopes to supplement existing local talent.

6.2 Understanding & Planning for Impact

To ensure the WIP will deliver on its intended impacts, two key elements should be developed during the Design phase and be present in the final Strategic Plan: 1) SMART Objectives and 2) an M&E framework recommendation.

SMART Objectives

The SMART Objectives are foundational to ensuring stakeholder alignment during Execution phase. SMART Objectives should clearly communicate stakeholders the WIP's overall performance objective across implementation, outcomes, governance, and funding dimensions. Such Objectives are:

- **Specific** outline in a clear statement precisely what is required
- **Measurable** include a measure to enable you to monitor progress and to know when the objective has been achieved or progress has been made
- **Agreed** ensure there is agreement on the objectives by key partners and stakeholders
- **Realistic** objectives may be challenging, but possible to be accomplished given resources, time, capacity and local context
- **Time-bound** the date by which the outcome must be achieved

Examples of SMART Objectives that reference implementation and outcomes dimension include:

- By 2030, the hours of municipal water supply interruptions on a 3-year annual running average resulting from issues in the watershed will be decreased by 80 percent compared to the 3-year running average before the WIP started (2019-2021).
- By 2025, flood risk to 2,000 hectares of agricultural land will be lowered by 80 percent for 50-year flood events compared to risk in 2015.
- By 2025, there will be 1,000 hectares of net- gain of native forest ecosystems in the water fund watershed compared to the extent in 2015.

M&E Framework Recommendation

The Strategic Plan should include a brief M&E Framework Recommendation section outlining the proposed monitoring and evaluation program, including which key indicators will be tracked, how monitoring and evaluation will relate to WIP adaptive management during Execution, what resources and capacity are needed to establish the M&E program, and what baseline data may need to be prioritized for collection. It is essential to include M&E in overall estimated WIP costs to ensure this aspect is fully funded during Execution Phase. M&E is critical to track implementation, to reduce uncertainties, to inform program adaptive management, to assess progress towards SMART objectives and to increase transparency and trust in the program. Note however that this section of the Strategic Plan is a framework recommendation; actually setting up and carrying out the M&E program requires detailed hydrologic studies, field visits, and instrumentation calibration; these activities are typically carried out in the beginning of Execution phase.

Key questions addressed by the recommendation include:

- Which key performance indicators will the program track? These should include indicators related to outputs, outcomes and impacts.
- What baseline data should be collected early in Operation to set a foundation for tracking progress? It is also important at this stage to decide how to capture and store this baseline data.

- How will the M&E program be structured. What staff and areas of expertise are needed? Will the M&E program be run entirely within the WIP or will the WIP contract out or partner on part or all of the M&E program?
- What are the key elements of the M&E program, including M&E implementation planning, data collection and storage, data analysis, integration of findings into annual or multi-year WIP program planning and communication of M&E results to stakeholders?
- How much will it cost to develop and run the M&E program? Costs might include staffing, contractors to carry out discrete or ongoing tasks, equipment purchase, installation and maintenance and software for analysing data or communicating results (such as a dashboard)?
- How will M&E data be stored, managed, and reported upon to ensure transparency and accountability?

THE GREATER CAPE TOWN WATER FUND

What is the GCTWF's institutional vision?

As of end of 2019, the GCTWF operates as a TNC-led programme, which most stakeholders view as appropriate but interim in nature. In the long term, the intended governance arrangement for the GCTWF is that it adopts the legal form of an independent entity, to be established as a public benefit organisation and as a non-profit company. It will most likely still be linked to TNC until the new entity is financially sustainable.

The institutional vision for the GCTWF is for it to be institutionally simple, to ensure low transaction and overhead costs, and the efficient management of operations and coordination of project implementation. The institutional structure of the GCTWF should allow the Fund to continue to “get things done” in an efficient and adaptable manner. Additionally, if the Fund is to attract private sector funding, transaction and overhead costs should be low, and red tape should not be an issue within its governance apparatus.

What are the GCTWF's SMART Objectives?

- By December 2025, avoided water losses of 55 Mm³ per year through removal of invasive alien plants and maintaining cleared areas
- By December 2025, 55,300ha invasive plants cleared in seven priority sub-catchments and 5,000 hectares on the Atlantis aquifer through collective action using integrated control methods, follow up 100 percent on schedule
- By June 2023, funding for the high-impact phase secured and key stakeholders adopted long-term sustainability framework
- By June 2023, the GCTWF entity established, Water Fund director and Board appointed, and funding secured for covering operational cost of the future entity
- By December 2021, three (3) additional SMMEs specializing in remote access are developed and 120 Specialized Remote Access Technicians trained, 350 green job FTEs created

- By June 2022, Monitoring Evaluation & Learning program rolled out for five elements, water, biodiversity (freshwater & terrestrial), management effectiveness, socio-economic, partnership satisfaction
- By December 2021, the Decision Support System is fully operational and adopted by all partners
- By June 2022, Decision Support System rolled out to include all 25 priority sub-catchments and Atlantis

What is the governance arrangement to achieve the GCTWF’s technical objectives?

In its current institutional form, the governance structure of the GCTWF includes a Steering Committee, assisted by a Secretariat (hosted by TNC), linked to three thematic groups: Data and Ops Working Group; Finance Working Group; M&E Working Group. These working groups are composed of a coalition of multi-sector partners. The Steering Committee’s role is to advise on strategic direction, advocate the work of the GCTWF, ensure institutional alignment, guide process towards independence and monitoring project impacts. It also monitors the implementation of the strategy and acts as consultative forum for partners. The secretariat’s role is to coordinate on-the-ground actions, coordinate the Fund’s 6-year implementation schedule and M&E, and build capacity, whilst each Working Group is responsible for identifying, undertaking and advising on actions related to its specific topic. This governance structure may change as the GCTWF is fully implemented, adopts a new institutional model, and follows a sustainable funding strategy.

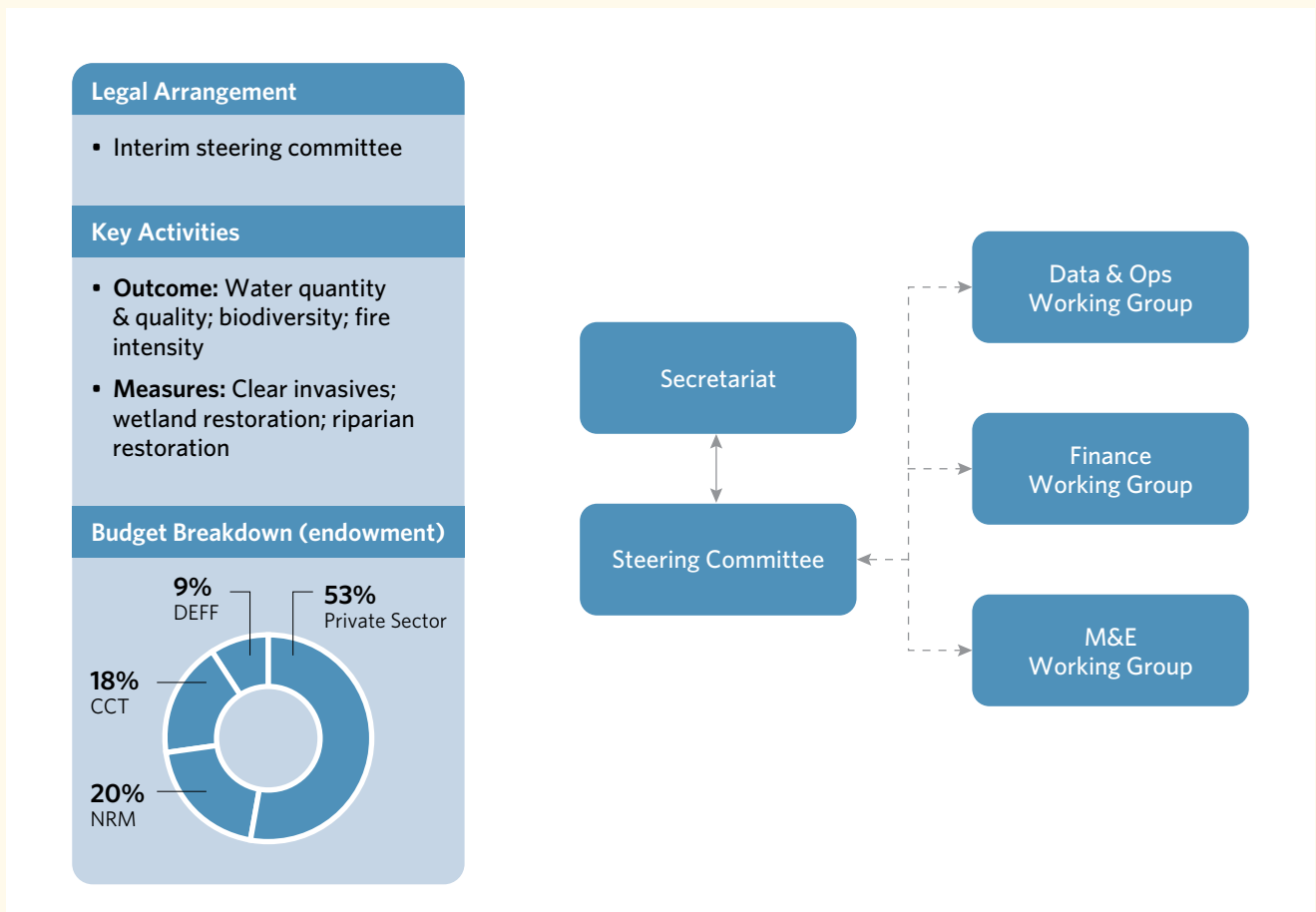


FIGURE 17.



THIS CHAPTER OUTLINES

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This chapter outlines the supporting activities for Execution Phase (including distinguishing aspects that fall under 'Start-up' and 'Operation').

The Guide concludes with commentary on WIP maturity criteria and the importance of adaptive management.

7.0

Execution



Execution Phase

Objective.
Operationalize the proposed design and manage implementation in an adaptive manner



Stakeholders. Ensure WIP director/leadership and governance parties agree on relative roles and responsibilities, and have confidence in overall program direction.



Science. The Strategic Plan M&E Framework component developed during Design is built out and activated during Execution. Additional scientific work may be required in terms of technical studies and analysis as field results begin to be generated with a view towards enabling adaptive management.



Funding & Financing. Monitor WIP full-lifecycle funding requirements to ensure that funding sources are available to meet the WIP's overall technical objectives and Program Vision. This may require source additional funding commitments to bridge gaps identified in the Sustainable funding strategy component of the Strategic Plan. Continue monitoring new and existing watershed initiatives to identify partners to crowd-in and/or provide in-kind support.



Governance. During this phase you will roll out your WIP as per your Strategic Plan and the governance recommendation contained therein; this entails appointing core staff, developing an operating manual to define systems and processes, and (if necessary) establishing an implementing entity if your WIP requires a dedicated legal vehicle.



Implementation. Mobilize capacity for implementation and execute against the WIP's annual operating plan to drive water security outcomes. Enable transparency and feedback loops with your governance parties and broader stakeholder set via regular operational reporting to maintain and further build enthusiasm for your WIP.



Key Output.
Annual Operating Plan tying together implementation, financial, M&E, communication and other operational needs



Impact.
Validate WIP outcomes via in-field **M&E program** and drive **Adaptive Management**

Given the heterogeneity of WIPs once they progress past Design phase, and the focus of the How-to Guide on ‘program preparation’ aspects versus ‘program execution’, this section is comparatively lighter than prior phase chapters and is more focused on general signposting rather than detailed workstream walkthroughs. At a high level, Execution Phase can be broken down into two components, Start-up and Operation, with certain supportive activities typical for each component. The chapter concludes with reflections on how to determine whether your WIP has reached Maturity—i.e., whether the required building blocks are in place to ensure the WIP is well-placed to meet its Program Vision and associated SMART objectives—and also details principles of adaptive management that allow for continue refinement of WIP implementation. To explore how WIPs fit into DFI financed operations, please see the [Sustainable Funding Deep Dive](#).

Core Questions to address during Execution phase include:

How to maximize operational efficiency & transparency? A key distinction between NbS and traditional grey infrastructure is the flexibility and dynamically shape the WIP’s implementation portfolio as additional implementation data points and scientific evidence are gathered (as opposed to binary large-scale grey investments that often generate ‘lock in’ once construction is begun). For example, the Upper Tana-Nairobi Water Fund realized that it could materially reduce materials costs for farmer retention basin investments by via centralized procurement practices.

How can field monitoring be used to validate results? A detailed Monitoring & Evaluation program serves to validate modelled ecosystem services gains to understand whether anticipated outcomes of field practices are truly driving water security and co-benefit outcomes.

Do core Program Vision and associated SMART Objectives require revision? As execution progresses, it may be necessary to refine the WIP’s program vision and associated SMART Objectives. This can be symptomatic of success—e.g., appetite from the stakeholder group to expand into additional service areas following hitting immediate program milestones; or perhaps it is desired to add an additional NbS activity to the overall portfolio following promising results from pilot interventions. Such revisions to Program Vision are appropriate but it is important to keep the funding, governance profile, implementation capacity, and M&E in balance, and therefore changes to overall scope must be considered across these aspects.

Outputs for Execution Phase are divided into ‘Start-up’ and ‘Operation’ components.

Start-up outputs include:

- **Implementation entity establishment:** If your Strategic Plan identifies that the WIP requires the establishment of a new legal entity (as opposed to an umbrella agreement or hosted program arrangement), then during the early Start-up stage of Execution it is appropriate to develop, capacitate, and implement supporting systems for this new entity.
- **Operating manual:** This will define the WIP’s processes & supporting systems.
- **Appoint core staff:** Depending on the functions elaborated in your Strategic Plan governance recommendation, it will be appropriate to hire various roles. Typical among this is a Director (in charge of overall leadership, fundraising, governance stewardship, and human resourcing), Implementation Manager (which may rely on directly-hire or contracted agents), and reporting/monitoring & evaluation oversight (a task that is even higher priority and more essential in collective action situation with multiple parties conducting implementation against a common plan).

Operation outputs include:

- **Mobilize implementation capacity:** The operational delivery component of the Strategic Plan needs to be affected during Execution, including potentially conducting training and capacity building measures if insufficient existing implementation skills exist to deliver your NBS Investment Portfolio.

- **Activate M&E program:** The M&E recommendation developed in the Strategic Plan should be fully fleshed out and activated to align with the key validation points required to feel confident that the modelled benefits articulated in the Feasibility Assessment are indeed translating into the desired level of water security and co-benefit outcomes.
- **Deliver annual operating plan:** This plan indicates, on an annual basis, how implementation will be systematically executed, program and implementation costs will be funded, progress will be communicated, and measurement of activities will occur as aligned with M&E plan. This plan is not produced on an annual basis, but rather delivers on the long-term strategic plan.
- **Provide impact reporting:** Articulating progress to your core governance members and broader stakeholder group is key for maintaining and building WIP momentum. Such reporting should include financial and operational indicators, estimates for water security and co-benefit outcomes, and 'lessons learned' aligned with corrective actions, all presented in a manner to build internal and external trust.
- **Secure additional funding commitments:** The Strategic Plan sustainable funding strategy compares the full-lifecycle funding need against in-hand commitments to determine whether a funding gap exists and provides recommendations for curing the gap. During Execution, it is appropriate to secure these additional funding commitments, a factor that becomes even more necessary if Program Vision is revised with expanded geographic or depth of implementation scope.

Top Tips to bear in mind during Execution phase:

- **Reiterate your talking points and show consistency in execution:** It is essential that WIPs deliver on the promises made towards funding and governance parties, as well as broader watershed stakeholders, and such trust-building is enabled via tight messaging aligned against Program Vision and subsequent aligned implementation execution to show that the WIP is an effective, competent institution for delivering outcomes.
- **Embrace the 'balancing act':** Executing against Program Vision requires a balancing act of finance, governance, implementation, and M&E. Closely monitor these related aspects to ensure they stay in harmony. It is recommended to revisit the Strategic Plan every three years to ensure the compatibility of these various components.
- **Keep crowding in partners:** As your WIP generates success, it is likely that additional parties with complementary or new initiatives will reach out. Be open to crowding in such interest and effort as it can help you reach your technical objectives faster and with greater resources. However, be selective in the addition of new partners to ensure consistent alignment with the WIP's SMART Objectives.

7.1 The Importance of Adaptive Management

The purpose of incorporating adaptive management into the operations of a WIP is to systematically use monitoring information and implementation results to make program adjustments and iteratively drive towards cost-effective implementation execution. Science-based adaptive management programs are designed to provide accountability to a wide range of stakeholders, including donors, investors, agencies, partners, communities, and land and water managers. Adaptive management provides a major advantage for watershed investment programs—as opposed to grey infrastructure programs which are less flexible and often generate 'lock in' investment paths—and therefore it is critical to build in processes to maximize adaptive management principles.

Adaptive management is important for the following reasons:

- **Managing uncertainty:** NBS investments often have wide outcome uncertainty bands due to the inherent complexity and heterogeneity of ecological & biophysical processes. Such uncertainty is only being further heightened in the context of anthropogenic climate change where NbS relationships to ecosystem services gains may not mirror historical conditions (a dynamic that also affects grey infrastructure). Adaptive management serves to reduce this uncertainty via monitoring and learning processes.
- **Systematic learning serves to accelerate project objectives:** Defined iterative learning cycles allows for insights to rapidly drive improved management decisions, allowing for more rapid program water security and co-benefit outcomes alongside improved cost-benefit.

The adaptive management process has five steps:

- (1) **Identify quantitative management objectives.** Identification of quantitative management objectives or desired conditions that include measurable triggers or thresholds to determine whether or not the objective is met.
- (2) **Plan and implement actions.** Plan and implement management actions that will achieve management objectives or desired conditions (but recall this is an experiment and often the outcomes are not precisely known).
- (3) **Monitor outcomes of management actions.** Monitor outcomes of the management actions; this involves: (a) selecting monitoring indicators or variables that explicitly relate to the management objectives or desired conditions; (b) identifying the data source and spatial scale of monitoring; and (c) specifying the measurement, analysis, and reporting frequency.
- (4) **Review monitoring results.** Analyse and review the monitoring results against the management objectives or desired conditions to determine whether or not the objectives have been met and, if not, review and modify management actions.
- (5) **Implement changes.** Implementation of the needed management changes (and continued monitoring).

This adaptive management mechanism should be closely linked to reporting and annual planning and integrated into the Monitoring & Evaluation Framework outlined in the WIP's Strategic Plan as articulated during Design phase.

7.2 Program Maturity: Ensuring Lasting Program Impact

WIP maturity is reached when your program is well-established, operational, and can confidently point to lasting contributions to water security. The criteria below provide a rough checklist to indicate whether Maturity stage has been attained.

CRITERION 1: Program Vision, Strategy, Planning & Procedures. *Indicates whether the WIP has strategic planning documents that guide its work and establish clear financial planning*

- **Strategic Plan:** WIP has an updated strategic plan that includes (1) SMART objectives, (2) a science-based implementation plan, (3) a monitoring & evaluation plan, and (4) funding/financing strategy indicating the WIP's resource needs and sources of funding.
- **Governance Document:** WIP has a publicly available governance document that establishes how the WIP operates, is managed and ensures transparency. Governance documentation outlines operating and decision-making procedures, human resources, financial management, grant-making, statutory compliance, etc., as appropriate. See Criterion 5 for additional information.

- **Annual Operating Plan:** For at least three consecutive years, WIP develops an annual operating plan aligned with its Strategic Plan.

CRITERION 2: Implementation. *Indicates whether the WIP is consistently implementing activities as expected in its Strategic and Annual Operating Plans*

- **Substantial Implementation Completed:** For at least three consecutive years, the WIP has substantially achieved its goal—including on the ground implementation—as articulated in its Annual Plan. Implementation must be documented (e.g., reports, maps, dashboard) and verified by monitoring & evaluation. Implementation goals include all interventions as established in its Annual Plan including, but not limited to, on-the-ground interventions, communications, environmental education, stakeholder engagement, etc.

CRITERION 3: Measurement & Reporting. *Indicates whether the WIP is adequately reporting its work to key stakeholders*

- **Publicly Publish Annual Report & Financials:** For at least one year, the WIP has publicly disclosed its Annual Report & Annual Financials. The Annual Report describes progress against its SMART objectives (outlined in its Strategic Plan) over the last twelve months and over the life of the WIP. Implementation and impact should be supported by verifiable monitoring & evaluation, and financial reporting should follow local regulations and standards. Communications should be prioritized not just for direct stakeholders, but also the broader community so that WIP ‘wins’ are clear to everyone, thereby bolstering the program’s sustainability over the long-term and inspire similar efforts in neighbouring watersheds.

CRITERION 4: Sustainable Funding. *Indicates whether the WIP has enough funding to reach SMART objectives and have its intended water security impact*

- **Funding to Operate for 3 years:** WIP has sufficient resources in hand—or identified in pipeline—to operate for at least three years according to costs outlined in its funding/financing strategy, which is a component of its Strategic Plan.
- **Sustainable Funding covers 50 percent of program costs:** WIP can cover at least 50 percent of their program costs with funding from sustainable sources. Sustainable funding sources provide structural long-term revenues (e.g., water tariffs, water abstraction charges, endowment revenues, & clearly defined government subsidies), as opposed to non-sustainable funding sources (e.g., one-off grants by foundation or corporations, or international transfers from foreign governments).

CRITERION 5: Governance & Influence. *Indicates whether the WIP is an effectively governed decision-making body, and whether its value is recognized in the area where it operates*

- **Governed by Decision-Making Body:** For the last three years, WIP has been governed by an effective decision-making body with adequate stakeholder representation and a clear mechanism for collaboration among public, private and civil society. WIP decision-making body is engaged in supporting the WIP.
- **Director/Manager:** All decisions made follow the process and procedures established in the WIP governance manual.
- **Influence and Recognition:** The WIP’s role is formally recognized in the area where it operates and can influence water-related decisions in this area. For example, the WIP can be formally recognized as part of local governance and decision-making bodies, e.g., as a member of a watershed and/or technical committee under an environmental authority; its role could be designated by a municipal ordinance; and/or a government agency with authority over water security could formally recognize the WIP as contributing to its function.

Criterion	Strategic Vision, Planning & Procedures	Implementation	Measurement & Reporting	Sustainable Funding	Governance & Influence
Criterion Purpose	Does the WIP have strategic planning documents to guide its work and establish clear financial planning?	Is the WIP implementing activities, including NbS investments, as outlined in its Strategic and Annual Operating plans?	Is the WIP transparently reporting its work to key stakeholders?	Does the WIP have enough funding to reach its SMART Objectives and have its intended water security impacts?	Is the WIP an effectively governed decision-making body and is its value recognized in the area where it operates?
Criterion Requirements	Produce Strategic Plan and Annual Operating Plan	Achieve WIP Annual Plan implementation objectives for three consecutive years	Publicly publish Annual Report & Annual Financials for at least one year	Funding to operate for three years; sustainable funding covers at least 50% of program costs	Governed by decision-making body for three years; WIP formally recognized where it operates

FIGURE 18. WIP Maturity Criteria

7.3 Links to Additional Resources

This Guide was assembled drawing upon The Nature Conservancy’s field experience across over forty Watershed Investment Programs, as well as the network of reviewers that assisted with providing constructive feedback and additional suggestions. We look forward to updating the How-to Guide in future years as we continue to gather evidence from local place-based engagements that can serve to further refine and strengthen this family of guidance documents.

For further guidance and resources with developing your WIP, please reference the ‘Take Action’ section of the Resilient Watersheds Strategy website [link].

THE GREATER CAPE TOWN WATER FUND

How to maximize operational efficiency & transparency?

To maximise its operational efficiency, every effort is made to communicate progress in a timely manner and maintain communication with stakeholder. This is done through the online [Decision Support System](#), monthly outputs from the operational and data working group, presenting forums, and participating in partner meetings and events. The GCTWF also informs stakeholders and funders of any developments or lessons learnt as they are encountered by the team. For example, at the beginning of the process, funders were made aware that a lack of data meant the GCTWF was initially based on hypotheses and assumptions. By involving donors and partners throughout the process, this has made them more open to changes and delays. Maximising transparency in the collective action process ensures that momentum from stakeholders and, importantly, funders, is maintained.

How can field monitoring be used to validate results?

The GCTWF was designed alongside its Monitoring & Evaluation strategy framework to ensure that impact is tracked, findings are validated, and credibility is built throughout the process. Field monitoring is used to collect data against cross-reference projected costs and timelines with what's happening in real-time, and the data generated will be used to update the modelling results of the Business Case. In so doing, the monitoring strategy helps to validate program costings, timings, and unit costs, and validates assumptions made in the Business Case to allow for overall adaptive management. As the program develops, and more invasive alien plants are cleared, field monitoring will hopefully also be used to showcase the impact of NbS on enhancing water security and freshwater and terrestrial biodiversity. In turn, this is hoped to illustrate the credibility of the program and serve to attract funders.

Data collection is therefore vital to the success of the GCTWF and has been in place since the Fund was initiated. This must be the right data, collected at appropriate scales to inform management actions. This monitoring will assess the impacts of invasive trees on stream flow and freshwater and terrestrial biodiversity. It will also assess the cost effectiveness and efficacy of control methods, impacts on beneficiaries and partnership satisfaction. The M&E Working Group consists of specialists, including restoration ecologists and hydrologists, to ensure that data collection is being undertaken with utmost rigor and credibility. Results will be analyzed to inform management actions and communicated with stakeholders.

Do core program objectives (e.g., NbS options list) require revision?

The GCTWF gather all data collected through monitoring activities at the end of each year, and these annual updates inform the GCTWF's strategic action plan. The implementation progress data is analysed by the Data & Operations Working Group, the results of which are used to determine if the GCTWF's program objectives and implementation target are achievable. The biodiversity (freshwater and terrestrial) impacts are validated by the M&E working group and presented to the steering committee with the socio-economic impacts and partnership satisfaction impacts. The evaluation will also consider funding streams and resourcing capabilities, such as management costings and whether funding scenarios need to be adjusted in the short term. Findings will be communicated with stakeholders and partners.

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