PROTECT SOURCE WATERS

AFRICA BUSINESS PLAN: 2019–2025

The Nature Conservancy

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TABLE OF CONTENTS

1 Executive Summary
1 Relevance to TNC's Shared Conservation Agenda
1 Situation Analysis
3 Goal, Outcomes, and Intermediate Results
4 Theory of Transformational Change
5 Elaboration of Strategy Outcomes
15 Monitoring and Evaluation
16 Risk Assessment
18 Implementation Timeline
20 Financial Projections
21 Appendix 1: Expanding Application of the Water Fund Model
22 Okavango River: Angola, Namibia, Botswana
24 Mbé River Basin: Gabon
25 Palmiet-Bot River/Overberg Basin: South Africa
26 Sebou River Basin: Morocco

TNC MISSION

The mission of The Nature Conservancy is to conserve the lands and waters on which all life depends.

TNC VISION

Our vision is a world where the diversity of life thrives, and people act to conserve nature for its own sake and its ability to fulfill our needs and enrich our lives.

EXECUTIVE SUMMARY

Africa has abundant freshwater resources, yet faces significant challenges in meeting the needs of its people. As populations and standards of living increase, this puts pressure on water for domestic, agricultural and industrial use. Water-sector infrastructure across Africa is expected to grow in the next decade to meet these challenges and the targets of the United Nations Sustainable Development Goals (SDGs), including improved access to clean water and sanitation.

The Nature Conservancy has been working for decades to demonstrate the effectiveness of solutions that further human development needs through better management of natural resources. Since 2000 we have been working with cities around the world on projects that invest in the protection of source water areas (e.g. by conserving and restoring forests and reducing agricultural pollution) in order to improve quality and quantity of water supply in urban areas. This strategy targets the protection of source watersheds across Africa through replicable financial and governance models that conserve ecosystems important for biodiversity and support a multitude of services needed by the society.

This strategy will work toward five outcomes to build the foundation for increasing investment in source water protection across Africa:

1. Implement a portfolio of successful **demonstration water funds**.
2. Promote the increase of **water-sector spending** on source water protection by utility and municipal funding authorities.
3. Engage with governments to apply enabling **policies and regulations** for source water protection.
4. **Build capacity** of public and civil society partners to deliver source water protection.
5. Mobilize support from a **community of allies**, including influential public and private champions across the continent.

RELEVANCE TO TNC'S SHARED CONSERVATION AGENDA

Shared Conservation Agenda Priorities:
Protect Land and Water; Provide Food and Water Sustainably; Build Healthy Cities

TNC Africa's Protect Source Waters Strategy aligns with the Global Water Funds Strategy, which aims to mainstream the water supply sector's investment in natural infrastructure across source watersheds to reduce the risk to water supply for 60 million people, create system change that ensures $4 billion/year of funding for watershed conservation, and reduce pollution in 20 basins through the enhancement of 1 million hectares of ecosystems.

This strategy contributes to three of the global priorities — to Protect Land and Water; Provide Food and Water Sustainably; and Build Healthy Cities in a world of rapid urbanization, a trend especially urgent in Africa. The outcomes will also provide climate mitigation and adaptation co-benefits, such as sequestering carbon and contributing to climate change resilience in vulnerable regions.

SITUATION ANALYSIS

Africa has vast freshwater resources, yet by 2050 the continent will double its population to 2.5 billion people and experience the greatest expansion of cropland globally. Most of the population growth will occur in cities, driving the demand for reliable municipal water supplies, while new cropland will require radically more water resources for irrigation.

Urban water utilities in sub-Saharan Africa source at least half of their public water supply from surface water (3.5 billion cubic meters annually), while the rest of the supply comes primarily from groundwater. The conditions of river drainage basins[1] are important for maintaining a reliable and high-quality water supply. In places where drainage basins have been affected by poorly managed land development (e.g., deforestation, drained wetlands, invasive plants, conversion to crop and pasture, urban construction), runoff accelerates and carries sediment and pollutants into water sources. In many places across Africa, groundwater

1 A drainage basin is the land where runoff from precipitation is captured, stored, and filtered before it flows into the river.

is connected to surface water and/or is replenished by infiltration from water running off the surface; therefore, groundwater also depends on the health of surface waters and vegetation cover.

Many cities in Africa already face significant threats to their water supplies due to poor land management, such as conversion of vegetation to cropland or urban settlements (Figure 1). For example, in Nairobi — a city of 6.5 million people — 60% of the population lacks reliable water, which is piped to taps approximately only once or twice a week. Most urban centers rely solely on expensive industrial filtration to secure safe drinking water for its populations, even though protection of the water's source can make water services cheaper and more reliable. Instead of paying for expensive filtration, land managers in the watershed (e.g., farmers) can be incentivized to change land use practices to improve the health of the areas around water sources and, therefore, the quality and timing of the water supply.

Water-sector infrastructure investment across Africa is expected to grow in the coming decade due to the rising need for energy to fuel the growing economies and the remaining gap to reach the sustainable development goals, including water and sanitation (WASH). It is estimated that sub-Saharan Africa has the highest need for capital expenditure to achieve universal basic WASH requirements as a proportion of gross regional product.

Investments currently favor "built infrastructure" (such as reservoirs and treatment plants) to pipe, store, and filter water. Green infrastructure can offer a cheaper and more sustainable alternative or help increase the robustness of the system when used in conjunction with gray solutions. However, the option of green infrastructure (e.g., protecting the sources of water) is not yet commonly used or understood, and there are few regulatory frameworks in place that encourage such environmental considerations. Given the expected magnitude of water-sector investments over the coming decade, there is a clear opportunity to better engage the water sector to achieve the human development objectives, by ensuring the health of freshwater ecosystems.

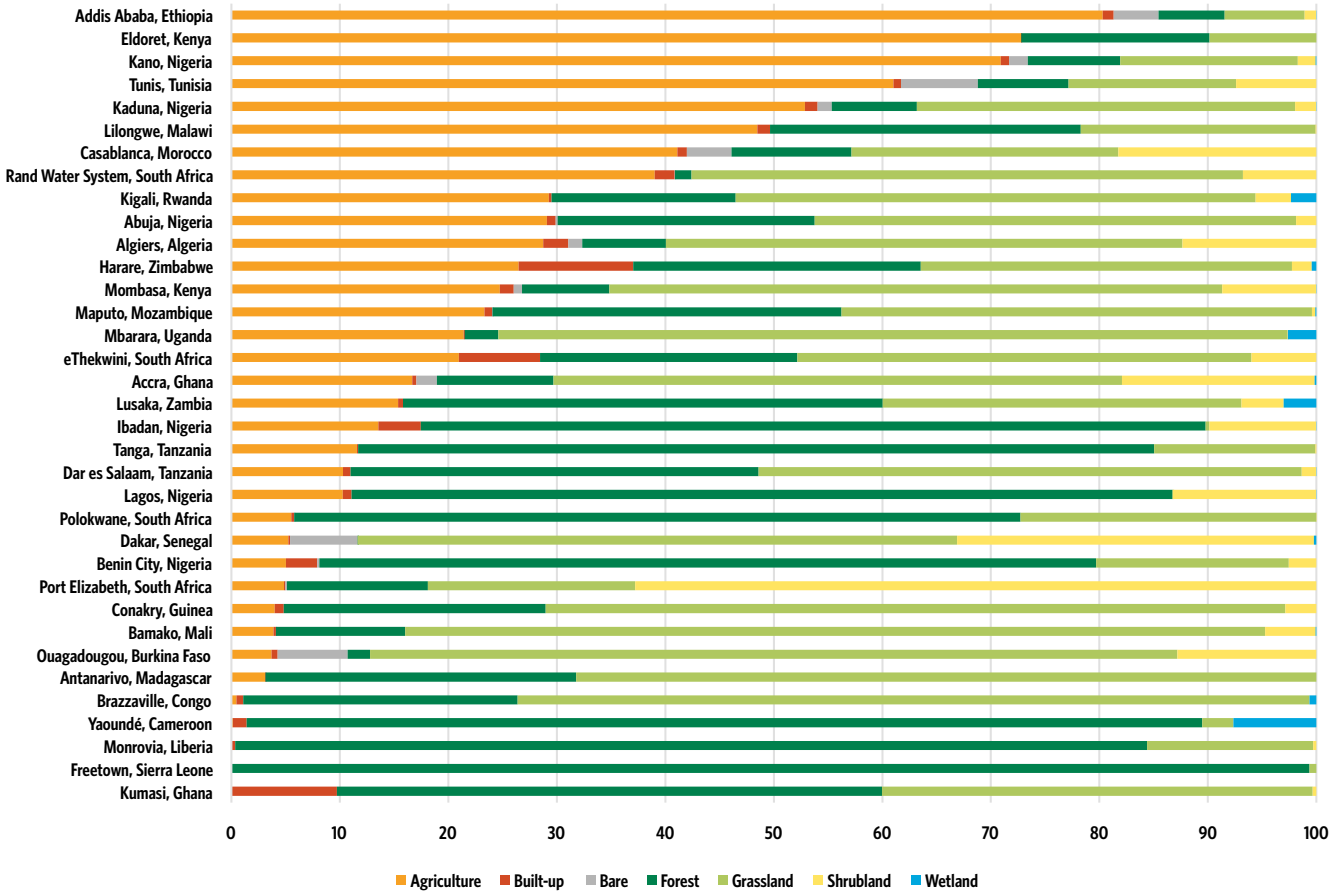

Figure 1. Classification of land uses within source water catchments of 30 African cities. The "developed" category accounts for 40% of the total land use and includes cropland and urban settlements.

GOAL, OUTCOMES, AND INTERMEDIATE RESULTS

Goal: By 2025, water-sector investment in source water protection across Africa will have reduced the risk of water supply disruptions for at least 25 million people; enhanced livelihoods for at least 100,000 people; and improved water quality or flow in 10 basins, at least five of which have high biodiversity value, through improved land use management across 1.8 million hectares.

Target date for all outcomes is 2025; target date for all intermediate results is 2022.

Outcome 1: A portfolio of water funds in Africa demonstrates on-the-ground results across diverse settings. The portfolio will include at least five TNC-led water funds in operation, seven partner-led water funds in operation, and seven additional partner-led water funds under development.

Intermediate Result 1.1: TNC-led water funds are operational in three cities in Africa.

Intermediate Result 1.2: Partner-led water funds, which are supported by TNC, are operational in three cities and are under development in four additional cities.

Outcome 2: Investments in source water protection are increased tenfold compared with the baseline through inclusion of source water protection requirements in IFI programs in at least three countries and through investments of five public funding authorities and 10 major private partners (e.g., utilities, corporations).

Intermediate Result 2.1: At least one IFI has included source water protection requirements in loan or grant screening criteria.

Intermediate Result 2.2: At least three public funding authorities include spending on source water protection in water-sector investment plans.

Intermediate Result 2.3: At least five major private partners (e.g., utilities, corporations) have increased spending for source water protection above the baseline.

Intermediate Result 2.4: A structure for a financing mechanism that will cover startup costs is created to accelerate deployment of new water funds.

Outcome 3: Two government water authorities/regulators are applying existing policies and supporting instruments to promote investment in source water protection, two more are in the process of designing policies to support source water protection, and one or more regional policy framework is passed and implemented.

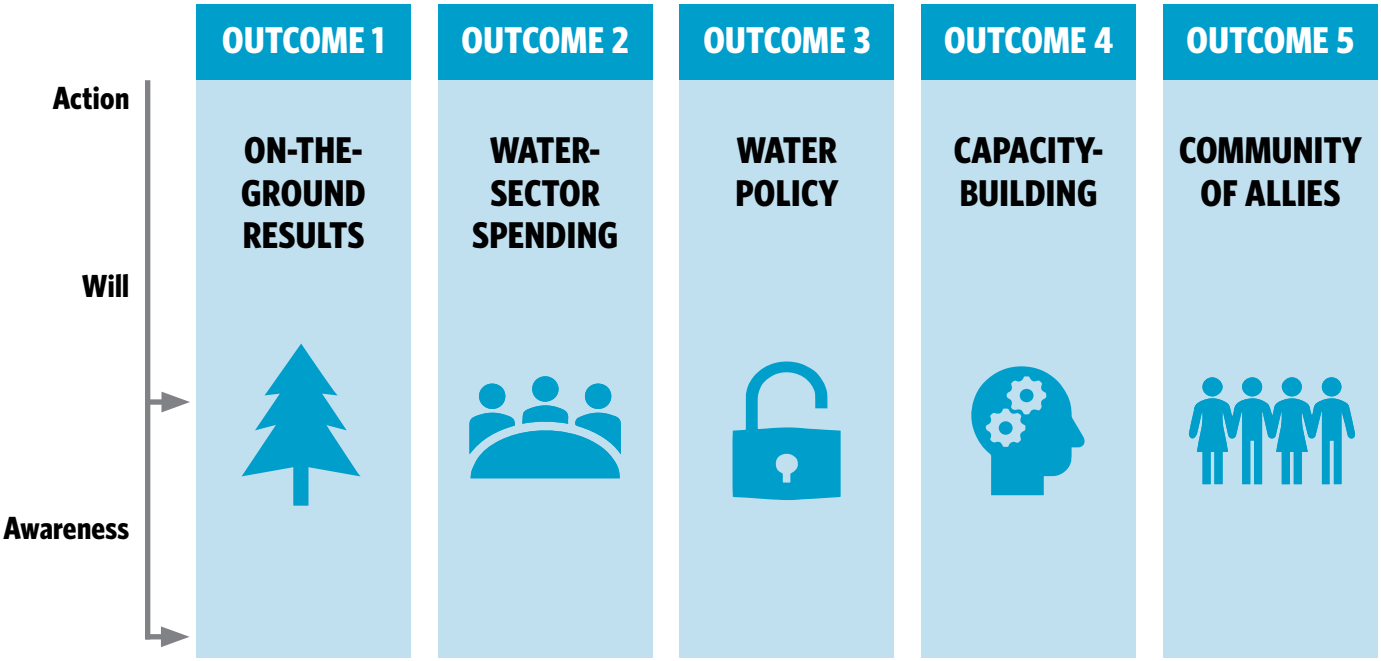

Figure 2. Five outcomes of TNC Africa's Protect Source Waters Strategy.

Intermediate Result 3.1: Four government water authorities/regulators, engaged by TNC through awareness-raising and capacity-building, evaluate their policy frameworks and create guidelines for implementing policy instruments that support investment in source water protection.

Intermediate Result 3.2: Regulators and/or authorities in four countries are engaged by TNC to take action to include source water protection costs in water user payments that are commensurate to increased reliability benefits to consumers.

Intermediate Result 3.3: Undertake consultations to socialize the water fund approach with at least two relevant regional bodies (e.g., SADC, EAC, AU) so that at least one endorses the approach and commits to drafting a policy framework that supports water funds.

Outcome 4: The Africa Water Fund Network provides capacity-building and knowledge exchange on source water protection mechanisms for water-sector practitioners across 14 geographies in Africa.

Intermediate Result 4.1: The Africa Water Fund Network is established and holds regular trainings.

Intermediate Result 4.2: 200 trainees from 42 locations have benefited from TNC's training and have become a part of the Africa Water Fund Network.[2]

Outcome 5: Influential African leaders from civil society, corporations, and government sectors from at least seven countries are organized into a continentwide Africa Source Water Protection Partnership.

Intermediate Result 5.1: A Source Water Protection Partnership is launched and has gained commitment to direct over $50 million to source water protection.

Intermediate Result 5.2: The Africa Source Water Protection Partnership has designed and hosted one summit benefiting at least 250 stakeholders from across the continent.

2 We assume that only one-third of institutions that are trained will proceed to developing water funds. Therefore, representatives from at least 42 sites should be trained in order for 14 to proceed to implementing water funds (14 partner-led water funds in operation or in design is the target of Outcome 1).

THEORY OF TRANSFORMATIONAL CHANGE

DIFFUSION OF INNOVATION

TNC Africa's Protect Source Waters Strategy aims to enable widespread adoption of the water fund model across the continent to ensure the health of freshwater systems and the societies that depend on them. This objective contributes to multiple SDGs including SDG 6, "ensure access to water and sanitation for all"; SDG 8, "promote sustained, inclusive and sustainable economic growth"; and SDG 15, "protect, restore and promote sustainable use of terrestrial ecosystems."

The strategy assumes the Diffusion of Innovation concept, which evaluates how innovations spread across groups of people and proposes that any population can be broken down into five segments based on people's willingness to adopt a specific innovation (Figure 3). Each segment of the population has its own characteristics and responds to different communication approaches. As more people adopt the innovation, there is a point at which the proliferation reaches critical mass and the rate of adoption accelerates throughout the society.

In this strategy, we focus primarily on enabling "early adopters" to implement the water fund model and thus influence the adoption of this model by the "early majority." We assume the following considerations about the two segment groups:

- Early adopters are already aware of the need to change and are open to taking risks on new ideas; this group has the highest degree of opinion leaders. The best strategy to involve this population is information-sharing and instruction (e.g., manuals, training, guidance).
- Early majority includes people who are open to innovation but require evidence of success to apply it. The key strategy to involve this group is demonstrating success with concrete evidence (e.g., proof cases of water funds, testimonials), and then tracking additional barriers and providing resources to overcome them.

Based on this social science framework, we predict that if we can demonstrate the success of the water

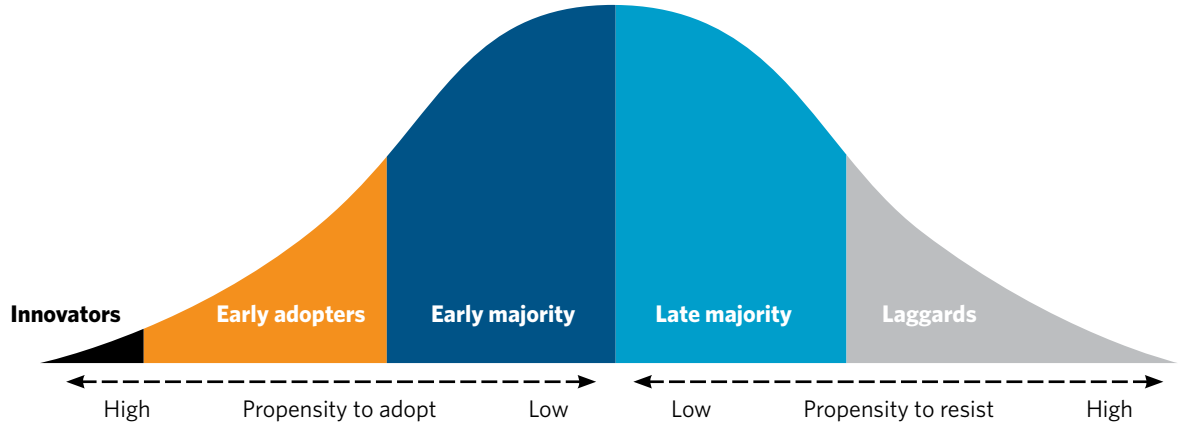

Figure 3. Segments of population classified by their willingness to adopt innovation.

fund model in a diversity of settings and build a network of leaders in high-profile African cities who are willing to give testimonials and advocate for these mechanisms, then the early majority of adopters will be willing to implement the model. Relevant stakeholders in the agriculture sector will also be targeted, given the important interdependency between agricultural practices and water quality.

Water-sector and relevant agriculture-sector stakeholders across all segments of the population will progress through the following steps of adoption:

- **awareness** of the water fund model through on-the-ground demonstrations;
- **mobilization** as targeted individuals and groups begin to implement the model while forming peer-supported networks; and
- **action** as implementing partners advocate for corporate and government partners to change investment priorities to include source water protection and to institute policies that reinforce long-term, natural infrastructure solutions.

CRITERIA-BASED SITE SELECTION FOR WATER FUNDS

We have created a set of criteria to identify the cities where implementation of a water fund could help with water security. The "Urban Water Blueprint" report[3] evaluated 54 cities across Africa and suggested that 28 of them could improve their water security by investing in conservation activities, such as forest protection and farming best management practices, potentially benefiting more than 80 million people. The list of identified cities was further refined to consider the enabling conditions that must be present for the water fund model to succeed (Table 1).

TNC will implement water funds primarily through partners and will lead only a portion of the projects. To evaluate at which locations TNC, rather than partners, should be the primary implementer, criteria in Table 2 will be used.

As of January 2019, TNC has committed to implement water funds in Nairobi and Cape Town and has moved forward with supporting partner-led water funds in Port Elizabeth and eThekwini (Durban), in South Africa; Dar es Salaam and Tanga, in Tanzania; Mombasa, Kenya; and Addis Ababa, Ethiopia (Figure 4). Remaining cities identified as potential sites of water fund implementation are currently under final assessment (Figure 5). TNC's geographic priorities are likely to adapt based on new information from further criteria-based analysis, partner outreach, and progress to meet intermediate and final outcomes.

ELABORATION OF STRATEGY OUTCOMES

OUTCOME 1: BUILD A PORTFOLIO OF SUCCESSFUL WATER FUNDS

The Nature Conservancy has created a governance and financial mechanism called the "Water Fund" that facilitates transactions between downstream water users to pool resources to compensate upstream land managers for conservation efforts. This approach has been well-developed and tested

3 "Urban Water Blueprint," The Nature Conservancy, available at http://water.nature.org/waterblueprint.

Table 1. Enabling conditions for water funds to be applicable and successful

ENABLING CONDITIONS	EXPLANATION
Recognition of water security threat	Recognition of a threat related to source water supply or water quality is a driving force for willingness to invest in source water protection.
Potential for nature-based solutions	Recognition that the identified water security threat could be measurably reduced with nature-based solutions.
Size of watershed	An assumption of the strategy is that water funds are more applicable to protecting smaller watersheds, preferably when the downstream population (potential buyer) is greater than the upstream population (potential seller).
Sound governance	Existence of a relatively sound governance system, which is defined by political stability, existing regulatory framework, and low corruption levels.
Water governance legislation	Existing regulatory framework specifically for water governance is key for establishing a water fund.
Financial resources	Availability of at least one major downstream user who is willing to invest in source water protection and supplementary donor funds once design phase is completed.
Implementers	Presence of an organization with the willingness and capacity to take the lead on implementation of the water fund.

Table 2. Criteria for selecting at which sites TNC should lead the water fund implementation

CRITERIA	EXPLANATION
Presence of a country office	In order to have sufficient administrative capacity, TNC will lead implementation only in countries in which TNC currently has an office or would like to open an office in the next five years.
Biodiversity value	TNC will prioritize its direct involvement in basins that demonstrate high freshwater and terrestrial biodiversity values.
Diversity of regional representation	As part of ensuring applicability of the approach across different settings, it is a priority for TNC to disperse its on-the-ground implementation sites across eastern, western, and southern Africa regions (but still only within countries where TNC has an office, as per the first criterion).
Diversity of viable conservation interventions	It is important that TNC's portfolio of implemented water funds demonstrates the effectiveness of different types of conservation interventions, such as agricultural best management practices (e.g., terracing, cover crops), ecosystem restoration (e.g., invasive species removal, wetlands installation, reforestation, riparian restoration), and sediment-point-source treatment (e.g., forest fuel reduction, dirt road management).

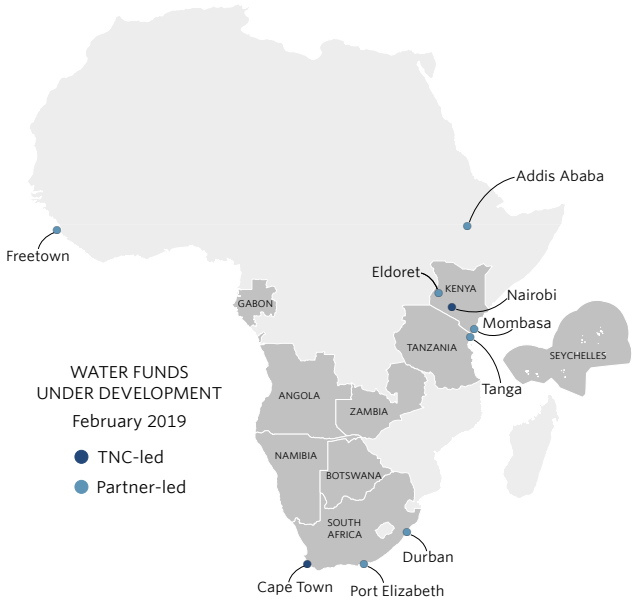

Figure 4. African cities where TNC-led and partner-led water funds are under development.

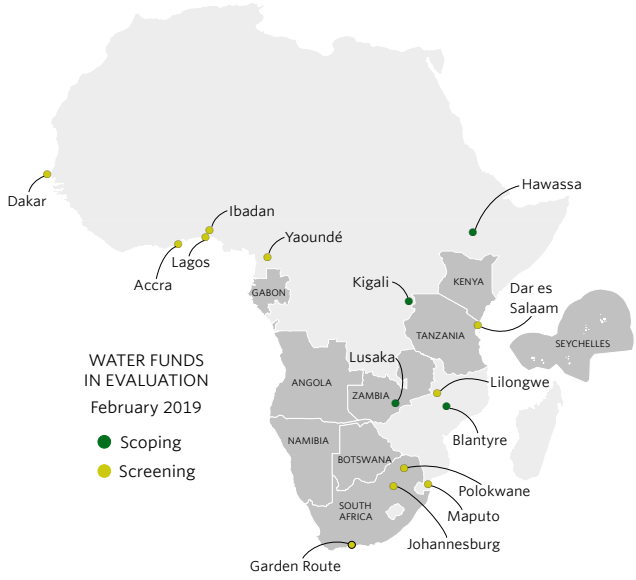

Figure 5. African cities under final assessment for feasibility of water funds. Cities under *screening* are undergoing initial spatial analysis; cities under *scoping* are undergoing a more advanced review to ground-truth the identified opportunity and projected impact at the location.

globally, resulting in a robust collection of guidance, tools, and lessons learned, as well as a robust project cycle (Figure 6).

TNC Africa's first application of the water fund model in the Upper Tana-Nairobi watershed, started in 2015, has proven that utility-led catchment conservation can be an effective and feasible solution in Kenya. Our science-based market research[4] indicates that the model is also applicable and cost-effective for many more cities in Africa. In the 2018–2025 period, at least 12 additional water funds will be added to the portfolio, building the evidence base.

The Nature Conservancy will design and initially operate five water funds by 2025. The rest of the portfolio (seven water funds in operation and seven in design by 2025) will be implemented by partner

4 Colin Apse and Nathan Karres, "Sub-Saharan Africa's Urban Water Blueprint: Securing Water Through Water Funds and Other Investments in Ecological Infrastructure." The Nature Conservancy: Nairobi, Kenya, 2016. Available at Sub-Saharan Africa's Urban Water Blueprint (2016) https://global.nature.org/content/sub-saharan-africa-urban-water-blueprint.

Box 1. Financial Structure of a Water Fund

The financial mechanism by which resources from water users are pooled and managed can take various forms, but the goal is the same — to create a sustainable funding mechanism for activities that protect water at the source.

Endowment Fund — a fund whose capital is invested in order to generate a steady annual stream of income. Only the investment interest and earnings are spent, while the principal is either maintained or increased.

Sinking Fund — a fund designed to disburse its entire capital plus its investment income over a designated period of time.

Revolving Fund — a fund in which the capital is spent and that periodically (e.g., annually) is replenished through fees collected and/or through donor contributions.

Hybrid Fund — a fund that combines two or more of these funding mechanisms. (Nairobi Water Fund has a hybrid financial structure consisting of an endowment fund and a revolving fund.)

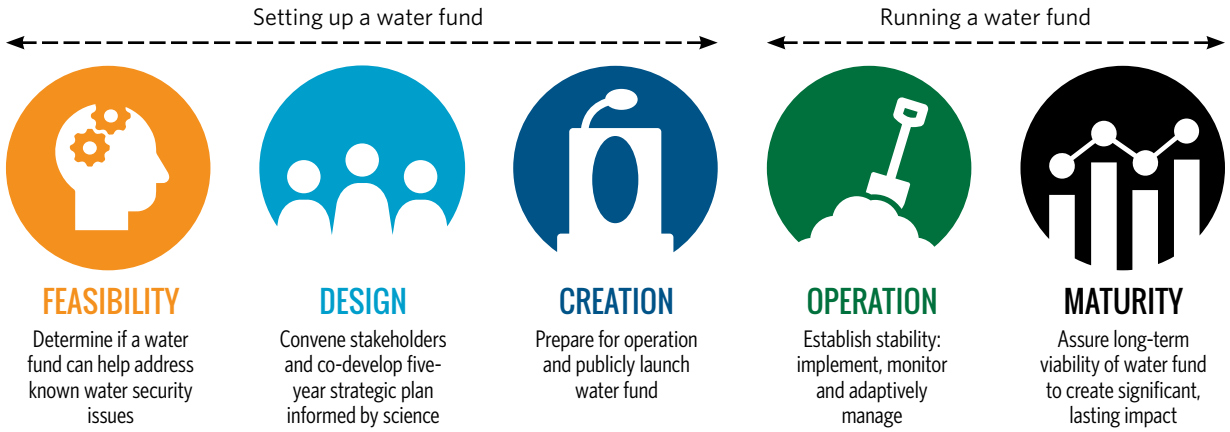

Figure 6. Project cycle for establishing water funds.

organizations with TNC's technical and capacity-building support throughout the water fund project cycle. TNC will offer a soft-certification to partner organizations that implement water funds and meet TNC's standards for implementation and credibility.

Appendix 1 includes a supplementary portfolio of work focused on innovation in the water funds sphere, in which TNC will be launching non-utility-led source water protection programs in four basins.

OUTCOME 2: INFLUENCING WATER-SECTOR SPENDING TO SCALE WATER FUNDS

Globally, $200 billion is spent annually on capital expenditure in the water sector, and $300 billion is spent annually on its operating costs. Outcome 2 focuses on diverting a portion of capital and operating expenditure in the water supply sector to source water protection, by either monetizing the avoided costs, increasing revenue (i.e. a green tariff), or facilitating access to debt (i.e. green bonds; Figure 7). We aim to enable more governments and multilateral/financial institutions to channel their planned water-sector investment spending on green infrastructure to protect sources of water supplies. Initially, funding will be channeled into specific water funds, but ultimately, we will establish a long-term financing mechanism that covers startup costs to deploy water funds faster. TNC will engage three types of partners to structure bankable deals (e.g., grants, loans) for source water protection.

1. **International Financial Institutions (IFIs):** The aim is to incentivize IFIs to include the consideration of source water protection as part of water infrastructure projects. A relatively short list of international lenders dominates water lending across Africa and includes the World Bank, African Development Bank, International Fund for Agricultural Development, European Investment Bank, UK Department for International Development, Agence Française de Développement (AFD), German Development Bank (KfW), German Federal Ministry for Economic Cooperation and Development (BMZ), European Union, and Export-Import Bank of China. This provides an effective integration opportunity to promote green infrastructure in instances in which such practices deliver cost-effective benefits. We will work with IFIs to determine reasonable levels of risk and advantages of investing in long-term solutions and focus the dialogue on presenting creditworthiness of water funds. We will also prioritize engagement with development banks that lend to the private sector (e.g., International Finance Corporation).
2. **Public funding authorities of municipal and national governments:** Lenders respond to the requirements of their clients; therefore, engagement with national and municipal governments is critical for generating demand-side interest. National and municipal governments make substantial investments in water infrastructure through the construction of reservoirs, pipelines for water conveyance, and water treatment systems. Many of these projects can be improved by including green infrastructure to enhance benefits delivery and/or improve the long-term operational efficiency of systems. Exposing government decision-makers to the benefits of source water protection and supporting those early adopters is critical to influencing demand.

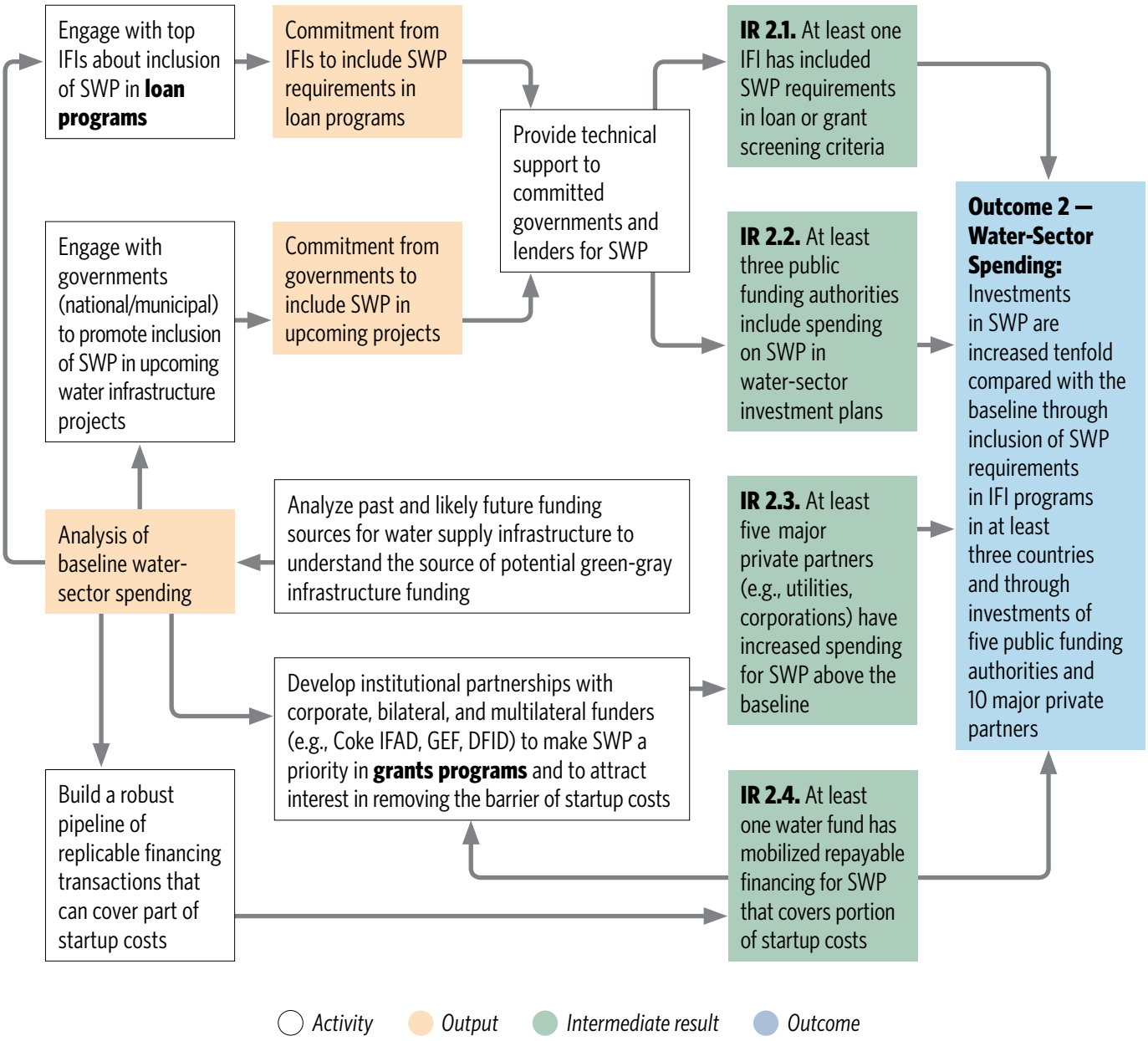

Figure 7. Increasing water-sector spending on source water protection (SWP) (Outcome 2).

3. **Private and grant funding providers:** Given the many co-benefits of source water protection, infrastructure projects that include green infrastructure may attract additional funding from private-sector actors to whom the co-benefits accrue. For example, both the International Center for Tropical Agriculture (CIAT) and Frigoken Ltd., Kenya's largest vegetable processor have invested in the Upper Tana-Nairobi Water Fund to improve livelihoods and productivity of participating farmers. Bilateral donors (in addition to restructuring loan requirements) can also play a catalytic role by providing grant funding for green-gray project design, masterplans, and technical studies that further influence the direction of water infrastructure spending over the coming decade. Additionally, TNC will directly engage private contractors involved in gray infrastructure development (e.g., Suez) and private-sector banks (e.g., Standard Chartered, Standard Bank, NED Bank, Barclays ABSA, Old Mutual, Investec), as well as their clients.

MOBILIZING REPAYABLE FINANCING

Upfront investments in watershed conservation can be crucial for accelerating implementation of source water protection plans (Figure 8). They afford economies of scale unavailable to an incremental approach and can help water users avoid or postpone costly capital investments in

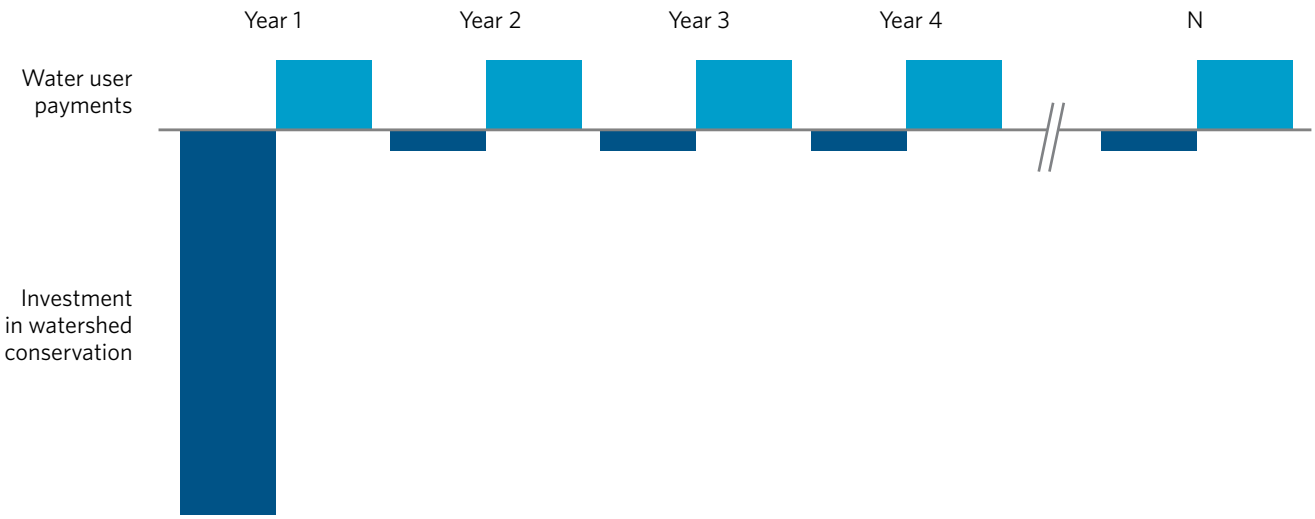

Figure 8. Upfront investment in watershed conservation with annual repayment by water users.

infrastructure. Upfront investments may also help water users meet regulatory requirements when compliance timelines are important. For example, voters in San Antonio, Texas, approved four ballot initiatives that authorized bond offerings to fund the Edwards Aquifer Protection Program. These bonds will be repaid through tax increases, while the upfront capital made land protection efforts possible in a condensed time frame.

Borrowing against future cash flow can also provide access to private financing. Today, only a fraction of watershed payment programs is "investment-ready"; however, water funds can serve as the foundation for meeting investment criteria (e.g., credit worthiness of counterparties, absorption capacity to accelerate implementation when funding becomes available). For example, the Upper Tana-Nairobi Water Fund has established trust with farming communities through a workforce of effective extension officers, which is a prerequisite for larger-scale investment.

Mobilizing repayable financing on a greater scale, with clearly identified funding sources to repay such financing, will help accelerate the inclusion of nature-based solutions in water sector investments. Indeed, the rigors of repayable financing (i.e. robust M&E, pre-arranged formal governance structures, clear contractual commitments) will serve to enhance the credibility of nature-based solutions, and hence enhance the case for watershed conservation at large. Our near-term goal is therefore to develop financial approaches that facilitate at-scale investments in source water protection and attract financing into Water Funds and similar vehicles (Figure 9). This will contribute to TNC's overall goal to shift perception of nature-based solutions from an optional "expense" to necessary water sector "asset", with more predictable and measurable risk-adjusted returns.

Figure 9. Typology of repayable financing structures.

TYPE	DESCRIPTION
1. Project Finance	• Relies on quantification and monetization of ecosystem benefits via contracted user payments • Can involve single, or multiple, beneficiaries
2. Hybrid Green/ Grey Issuances	• Overlays traditional 'grey' water sector investment issuances with supportive 'green' measures • Overlays traditional 'grey' water sector investment issuances with supportive 'green' measures
3. Venture	• Creation of self-supporting standalone entity that delivers nature-based solutions and receives revenues/cashflows for these activities
4. Premium Recapture	• Bundles risk transfer contract (e.g. riverine flood insurance cover) with installation of nature 'resilience' investment (e.g. restoration of floodplain) in single blended solution • Premium re-captured during life of contract to help pay off NBS resilience investment

OUTCOME 3: WATER POLICY

Most countries in Africa have policies in place that are conducive to using green infrastructure to protect sources of water and indirectly support the establishment of water funds. But policymakers and water regulators rarely recognize (or are even aware of) green infrastructure options as a means of meeting compliance, adding to higher perceived risk of these solutions. A lack of awareness or poor communication among stakeholders, including regulators, policymakers, private-sector and academic or research institutions, as well as few robust assessments of existing experiences and lessons learned hinder the adoption of this concept. Information should be provided to decision-makers and regulators about the economic and social benefits of green infrastructure over gray infrastructure, particularly the knowledge and lessons learned from TNC's water funds. Such an approach will help provide tangible, system-level solutions — addressing community engagement in water policy and encouraging investment in water infrastructure.

TNC will work with partners to provide policy analysis and knowledge for countries to incorporate source water protection into their own water management policies and to create guidelines for implementation of plans. A good example of this comes from Kenya, the site of Africa's first water fund. Prior to implementing the water fund, Kenya had several water protection policies in place; however, it lacked a systemic approach for effective

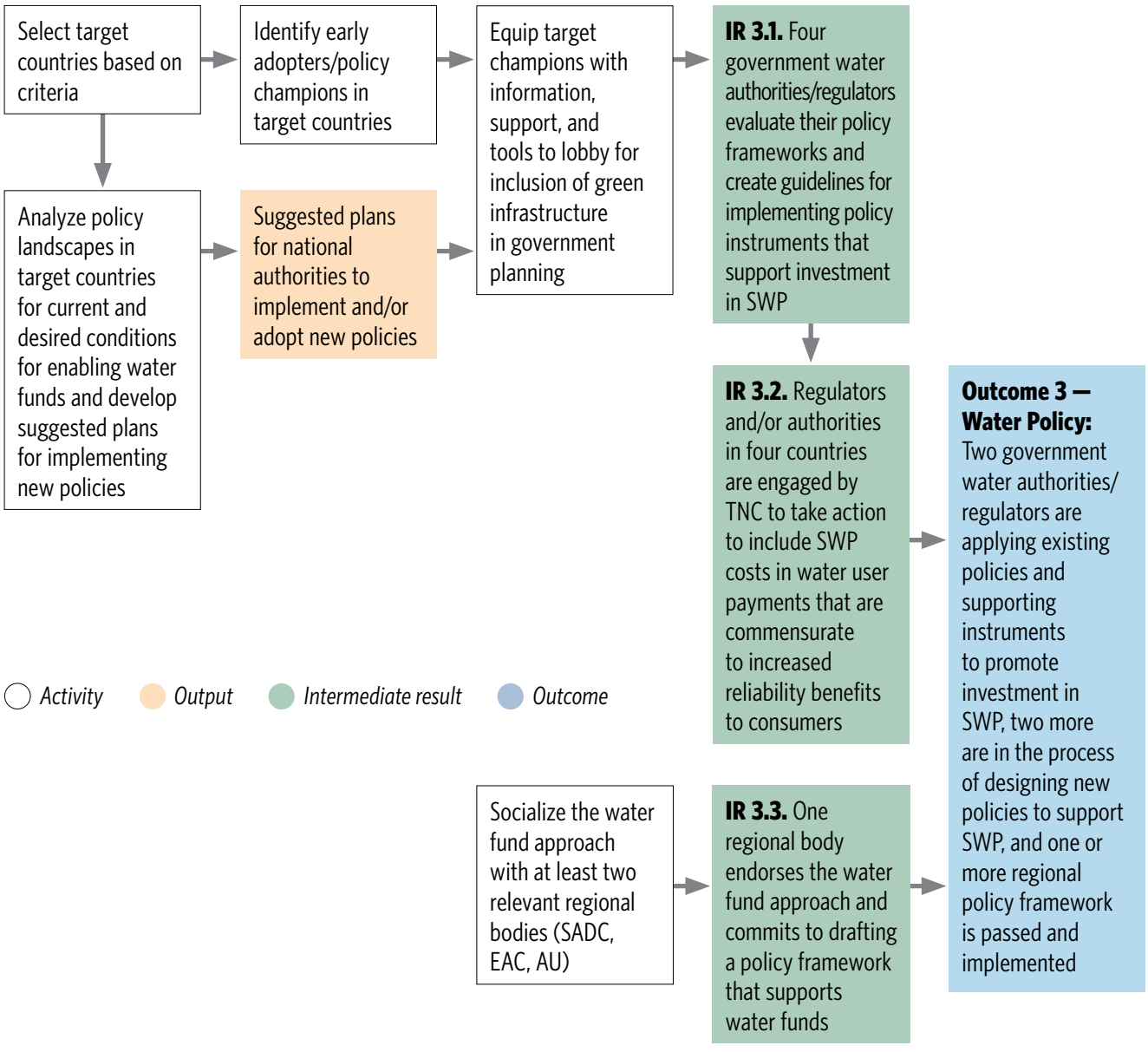

Figure 10. Incentivizing policies and regulations for source water protection (SWP) (Outcome 3).

source water protection, and there were serious deficiencies in implementation and enforcement. The government also had limited information on new, holistic, progressive approaches, possibly due to limited access to best practices, knowledge, and capacity.

Following TNC's in-depth work with the government to demonstrate the value of source water protection, the Kenyan government declared the Upper Tana-Nairobi Water Fund a national priority in 2017. The government then allocated $8 million, a significant portion of its Global Environmental Facility national allocation, to support the water fund's establishment and conservation investments.

The water fund was further tasked with spreading the methodology to two other cities in the country. In 2018, the Kenyan government issued a Presidential Directive requiring all government agencies to include a budget item for source water protection as part of all project budgets and as part of all tender documents. This shows that with proper sensitization, more governments in Africa can adopt and implement policies and practices that support source water protection.

There are three stages of implementing the water policy section of the strategy (Figure 10):

1. **Policy analysis.** There are currently few known actual policy barriers to increasing government spending on source water protection, but a major factor hindering governments is the lack of awareness amongst decision-makers and water regulators of the potential of green infrastructure to provide water services and comply with laws and regulations. To better understand how to take advantage of existing policies and improve enabling conditions for new policies, a comprehensive, 360-degree policy analysis is needed. This analysis should consider global (e.g., SDG, UNFCCC, CBD, Ramsar, etc.), regional, and local frameworks and policies and suggest a plan for national authorities on how to move toward implementation and/or adoption of new policies. In addition to delivery of a policy screening and recommendations, it would also enable TNC to start a dialogue with the key stakeholders and gain recognition and trust, which will be instrumental at the operational phase.

   Identifying appropriate and permanent funding models to implement source water protection policies will also be needed as part of this analysis. Water tariffs is one risk area, which TNC will need to keep in mind and address in new and innovative ways. Most African countries have constitutionalized water as an inalienable right for all citizens and often subsidize its cost. Therefore, increasing taxes or other duties on water can pose problems. To address these risks, any policy analysis would likely need to account for equitable access to water. One example of this is the water policy analysis for South Africa. This analysis considered that changes in tariff structure in the regulatory and legislative policies at municipal, provincial, and national levels must enable source water protection to provide equitable and affordable access to water for all.

2. **Awareness raising.** To attain necessary endorsement and buy-in from government leadership, TNC will engage early adopters/policy champions and invest in identifying and equipping these champions with the necessary information, support, and tools to lobby for inclusion of green infrastructure in government planning systems, financial allocation, and policy dialogue. Target countries for engagement of policy champions will be selected based on the following criteria: regional representativeness, political and financial viability, opportunity for regional or global replication, and governance capacity. Early government adopters will be brought along the spectrum of engagement from knowledge and understanding to commitment and, finally, to action. TNC will also strengthen its relationship and engagement with key regional actors, such as African Water Association, which brings together sector utilities and government agencies.

3. **Regional policy development.** For source water protection to be championed in Africa, there will need to be broader understanding and support for Water Funds as a model across the continent. Regional policymaking bodies will be engaged in providing the enabling framework and information for member countries to adopt. Target bodies include, but are not limited to, the East African Community, Southern Africa Development Community, and the African Union. TNC and partners will provide

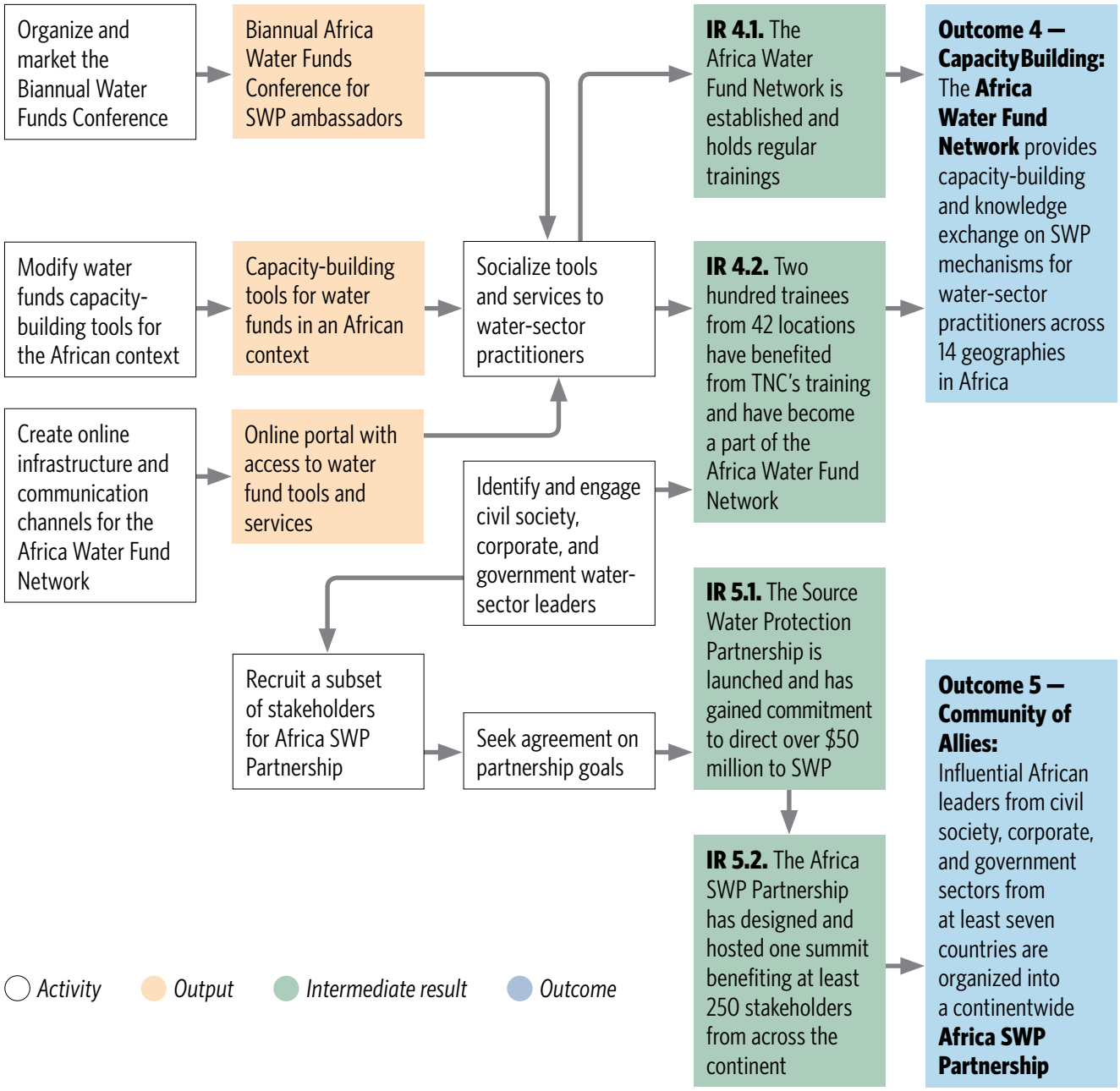

Figure 11. Building capacity for implementation of water funds (Outcome 4) and growing the community of allies for source water protection (SWP) (Outcome 5).

information to utility and corporate leaders, donors, U.N. agencies, and others to help integrate water funds into regional conservation agendas and action by national governments.

OUTCOME 4: BUILDING CAPACITY FOR IMPLEMENTATION OF WATER FUNDS

Outcome 4 focuses on training practitioners who can implement the water fund model across the continent. This will be achieved through online resources, in-person workshops, and peer-to-peer knowledge exchanges (Figure 11).

Numerous online resources for water funds are already developed, including 20+ training modules, the Water Funds Toolbox, and the *Water Funds Field Guide* for practitioners. In the first year, these resources will be adapted to the Africa context, as needed. TNC hosted its first in-person training workshop in Africa in 2017, attended by 50 participants from nine organizations. Recruitment for future workshop attendance will target public- and private-sector leaders from diverse sectors in geographies that meet the enabling conditions for water funds. The aim is to train representatives from 42 African institutions (~200 people).[5] Trainees will ideally move through a series of in-

Box 2. Objectives of the Source Water Protection Partnership include:

- Provide leadership to source water protection and water funds development across Africa.
- Offer high-level leadership in fundraising and outreach necessary to achieve funding targets, including establishing a financing mechanism for long-term water funds acceleration.
- Leverage the influence of partnership members to lobby for inclusion of green infrastructure in government planning systems, financial allocation, and policy dialogue.

person and/or virtual trainings, covering topics sequentially from feasibility to design to creation of water funds.

To accelerate knowledge exchange and the deployment of water funds, TNC will establish the Africa Water Funds Network, which will function as a sub-group of TNC's already established Global Water Funds Network. A formal membership recruitment mechanism for water-sector practitioners and investment decision-makers will be established, including but not limited to attendees of TNC's training workshops. The network will serve as a one-stop-shop for resources (e.g., an online open source toolbox for implementing water funds, best practices, and efficiency tools), knowledge exchange among members, and technical consulting services provided by TNC. The network will either host its own biannual conference for water fund practitioners or it will partner with another conference organizer (e.g., Business of Conservation) to include a track on source water protection.

OUTCOME 5: GROW THE COMMUNITY OF ALLIES FOR WATER FUNDS

Widespread acceptance and adoption of water funds can only be possible if the broader community, and particularly decision-makers, demand these practices. The importance of peer networks for the spread of information about innovations that are perceived as risky has long been known. Most people are reassured by others who they personally know and trust, who themselves have successfully adopted the innovation. The Africa Source Water Protection Partnership will be established to create a platform for this exchange.

TNC will first convene influencers in the water and the agriculture sectors in South Africa to raise the profile of source water protection spending. After building the initial momentum, the Source Water Protection Partnership will be expanded to at least seven countries, recruiting members from TNC's current networks and through alliances with national, regional, and municipal organizations, including Africa Water Association (AfWA), African Forum for Utility Regulators, and ICLEI Africa. This effort will be done in coordination with TNC's global effort to accelerate the adoption of water funds through strategic coalition building, as already started by the Latin America Regional team. TNC will initially offer the necessary secretariat services, establish the governance structure (e.g., the board), and coordinate meetings and events. Eventually, responsibilities will be handed off to partnership members, who may take on rotating leadership roles.

IN SUMMARY

All five outcomes will be targeted simultaneously due to interdependence in their associated activities. By 2025, there will be an evidence base for the success of water funds across different contexts in Africa, as well as a strong network of influencers who can co-advocate for investments and policies supporting source water protection.

5 We assume that only one-third of institutions that are trained will proceed to developing water funds. Therefore, representatives from at least 42 sites should be trained in order for 14 to proceed to implementing water funds (14 partner-led water funds in operation or in design is the target of Outcome 1).

MONITORING AND EVALUATION

Contribution of this strategy to the Shared Conservation Agenda will be monitored and reported through a set of indicators agreed-upon at the organizational level, such as "basins with sediment or nutrient pollution" and "the number of people with reduced risk of water supply disruptions due to water quality or quantity problems."

In addition to reporting on the Shared Conservation Agenda, the Protect Source Waters Strategy will be monitored and evaluated by a set of indicators specific to each outcome and intermediate result (Table 3). These indicators assess the appropriateness, effectiveness, and efficiency of the theory of change on the delivery of outcomes.

Table 3. Indicators to monitor progress on outcomes and intermediate results of the Protect Source Waters Strategy

OUTCOME	INTERMEDIATE RESULT	INDICATOR *Each indicator will have an accompanying Indicator Reference Sheet with a detailed description of what data are being collected, how, by whom, and at what frequency.*
OUTCOME 1: On-the-Ground Results	IR 1.1	Number of TNC-led water funds in operation
	IR 1.1	Number of basins with improved watershed health
	IR 1.2	Number of partner-led water funds in operation and/or with implementation plans under development
	IR 1.1 IR 1.2	Number of people with direct benefit from water funds (includes reduced risk of water supply disruptions and improvement of livelihoods); percent of water fund beneficiaries who are women
	IR 1.1 IR 1.2	Number of TNC and partner-led water funds that demonstrate trends in water quality or river flow improvement
	IR 1.1 IR 1.2	Number of acres/hectares with improved environmental conditions in high-biodiversity-value watersheds
	IR 1.1 IR 1.2	Percent reduction of sediment load in watersheds with water fund interventions
OUTCOME 2: Water-Sector Spending	IR 2.1	Number of IFIs that have included source water protection in loan program requirements
	IR 2.1	Number of countries where at least one IFI has implemented loan programs with source water protection requirements
	IR 2.2	Number of public funding authorities that have committed to including source water protection in water-sector plans compared with baseline
	IR 2.3	Number of private funders (e.g., utilities, corporations) that have increased source water protection spending compared with baseline
	IR 2.1 IR 2.2 IR 2.3	Total new funding committed for source water protection compared with baseline
	IR 2.4	Percent of total new funding for source water protection that is marked for a long-term financing mechanism (versus short-term grant funding)
OUTCOME 3: Water Policy	IR 3.1	Number of water authorities that have evaluated their policy frameworks and created guidelines
	IR 3.2	Number of regulators/authorities that have included source water protection costs in water user payments
	IR 3.3	Number of consultations conducted with relevant regional bodies
	IR 3.3	Number of regional bodies that have committed to drafting a policy framework in support of water funds

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OUTCOME 4: Capacity-Building	IR 4.1	Launch of the Africa Water Fund Network
	IR 4.2	Number of practitioners who are trained by and are part of the network; percent of trained practitioners who are women
	IR 4.2	Number of institutions that are trained by and part of the network
	IR 4.2	Number of key institutions whose core team has completed water funds feasibility study
	IR 4.2	Percent of trained institutions that are implementing water funds
	IR 4.2	Percent of partner-led water funds that have received a soft certification
OUTCOME 5: Community of Allies	IR 5.1	Number of water-sector leaders who are members of the SWP Partnership; percent of water-sector leaders in the SWP Partnership who are women
	IR 5.1	Number of countries represented by members of the SWP Partnership
	IR 5.1	Funding for source water protection raised through the partnership

RISK ASSESSMENT

Table 4. Risks from assumptions and mitigation options

RISK	ASSESSMENT AND MITIGATION
Outcome 1 — On-the-ground results: Implemented water funds do not systematically deliver results at the scale of the watershed in a variety of ecological, socioeconomic, and political conditions.	It is assumed that because we have shown some initial results in Africa (Upper Tana) and elsewhere in the world (e.g., Latin America) we can deliver those results in a wider variety of contexts. To mitigate the risk of water funds failing, screening criteria for ecological, socioeconomic, and political conditions will be used to select target locations. Additionally, investing in robust monitoring and evaluation (M&E) will provide clear indicators for making adjustments if progress is not on track.
Outcome 1 — On-the-ground results: In watersheds that contain multiple jurisdictions, conflict among jurisdiction authorities about revenue-sharing prevents execution of upstream conservation activities.	Conflicts in revenue distribution may arise in watersheds where multiple jurisdictions (e.g., counties, states, nations) are involved in conservation activities upstream and in consumption of water downstream. To mitigate possibly debilitating conflicts, it is essential to involve all relevant leaders in initial stages of formulating the water fund and to address revenue-sharing allocations based on principles of ecosystem service payments.
Outcome 2 — Water-sector spending: TNC is unable to convert a sufficient portion of water infrastructure funding to source water protection.	Given the infrastructure needs and spending trends in Africa, it is assumed that in the next decade, spending by African governments on water supply infrastructure will be significant enough that a portion of it can be diverted to source water protection and produce a measurable impact on conservation outcomes. To mitigate the risk of inability to divert sufficient government funding to conservation, we will also explore additional financial instruments that can help to incentivize government spending on source water protection.
Outcome 2 — Water-sector spending: There are too few utilities across Africa that generate their own revenue.	Utilities that do not have control over their revenues and budgets are not successful partners for water funds. Therefore, proliferation of the water fund model is possible only if there is an increasing number of local utilities that collect their own revenue and have control over how it is spent. Policy advocacy and growth of the community of allies for water funds (outcomes 3 and 5) offer an opportunity to mitigate this risk and provide conditions in which these types of utilities proliferate. Supplementary funding sources will also be generated through IFI loan and grant programs.
Outcome 3 — Water policy: Utility authorities, either at the city or country level, do not follow through on implementing natural infrastructure solutions.	Utility authorities in Africa have not typically focused on source water protection as part of their responsibility and may need additional incentives. We will replicate early experiences in Kenya by focusing on utility rule changes that are achievable within the jurisdictional scope but have an impact on green infrastructure spending.

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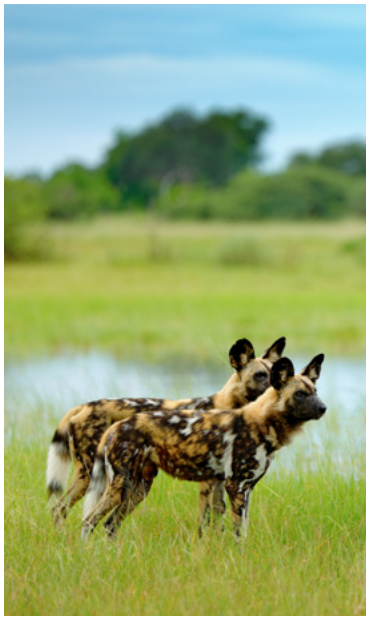
RISK	ASSESSMENT AND MITIGATION
Outcome 3 — Water policy: Regional policy (AU, SADC, EAC, etc.) is created but has little effect on source water protection.	The African Union, Southern African Development Community, and East African Community can create regional policies but have little funding or ability to implement them. Therefore, our investment in regional policy reform will be based on a clear analysis of which regional institutions, if any, can lead to most impact.
Outcome 3 — Water policy: New water policies hinder access to water for poor and vulnerable communities.	Key mitigation opportunity will be to ensure that policy recommendations incorporate the rights-based principles and to safeguard equitable access to water.
Outcome 4 — Capacity-building: Key partners do not have the skills, funding, or genuine motivation to demonstrate results across partner-led water funds.	Given TNC's limited existing and likely future geographic footprint in Africa, water fund success will depend on careful selection of partner organizations. We budgeted to support these organizations through the project cycle to ensure success of their water funds (e.g., Outcome 4). Additionally, TNC will establish a soft certification, which will serve as a stamp of approval that required guidance and process for establishment of the water fund have been followed.
Outcome 5 — Community of Allies: TNC is unable to protect the "Water Funds" brand as a credible source water protection tool.	If other organizations use the term "water fund" for initiatives that do not have the same level of impact and implementation standards, this will affect the credibility of TNC's initiatives titled as "water funds" and cascade further to reduce corporate fundraising success. To address this concern, TNC's communications team will standardize how to approach water funds branding across the organization, ensure that rigid parameters for a soft certification are established upfront, and take proactive reputation management of risks (e.g., preemptively acquire URLs for upcoming water funds).
Outcome 5 — Community of Allies: Corporations do not buy into the water fund model beyond individual corporate social responsibility donations.	It is important that corporations see the link between the health of watersheds and their business sustainability — and invest in source water protection (and not just in water efficiency). The risk of corporations overlooking this opportunity will be mitigated by reinforcing the ROI on such investments, especially by demonstrating benefits of these investments through robust M&E. Additionally, the Africa program will continue to work with TNC's Corporate Engagement and Global Water teams to include the most relevant information into the business case.
Outcome 5 — Community of Allies: The water fund model gets lost among competing ideas on water stewardship.	There are numerous environmental and human development organizations working across Africa to achieve water and sanitation goals, and there is a risk of ideas getting lost among the noise of various proposed practices. The Africa Source Water Protection Partnership will be established to mitigate this risk by consolidating leadership on source water protection and form key partnerships with other initiatives.



IMPLEMENTATION TIMELINE

Table 5. Timeline of major milestones and personnel requirements for the duration of strategy implementation

OUTCOME	WORK STREAM	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025
OUTCOME 1: Portfolio of Water Funds	Nairobi Water Fund	**IMPLEMENTATION**						
		Nairobi Water Fund Manager, M&E Officer, Field Manager, Program Manager, Operations Administrator, Data Manager						
		East Africa Water Funds Director (20%)						
	Cape Town Water Fund	**DESIGN**			**IMPLEMENTATION**			
		Cape Town Water Fund Manager						
		South Africa Regional Water Funds Director (50%)		South Africa Regional Water Funds Director (20%)				
			M&E Officer					
		Advisor (25%)						
	Water Fund 3 (location in West Africa tbd)	**SCOPING**	**DESIGN**		**IMPLEMENTATION**			
			Water Fund Manager, M&E Officer					
			West Africa Water Funds Director (50%)		West Africa Water Funds Director (20%)			
		Advisor (25%)						
	Water Fund 4 (location tbd)			**SCOPING/DESIGN**		**IMPLEMENTATION**		
				Water Fund Manager, M&E Officer				
	Water Fund 5 (location tbd)				**SCOPING/DESIGN**		**IMPLEMENTATION**	
					Water Fund Manager, M&E Officer			
	Partner-Led Water Funds (PLWF) Development	**1st PLWF**	**1st & 2nd**	**2nd & 3rd**	**3rd & 4th**	**4th & 5th**	**5th & 6th**	**6th & 7th**
	FULL WATER FUNDS PORTFOLIO SUPPORT	Global corporate engagement and policy support for water funds development (20% of Africa's personnel costs)						
		Global technical support for partners implementing water funds (20% of subcontract costs)						
OUTCOME 2: Water-sector spending		**1 deal**	**2 deals**	**2 deals**	**2 deals**	**2 deals**	**2 deals**	**2 deals**
		Regional lead for IFI relations (10% per IFI engagement/deal); Country-level External Affairs staff (20% per deal)						
		Global Finance Project Manager (30% per deal); External Affairs Support (10% per deal)						

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Light blue indicates Global Water Team's personnel *Medium blue indicates Africa Region's personnel* *Dark blue indicates sequencing of major milestones*

(100% of full-time employee is assumed, unless indicated otherwise)

OUTCOME	WORK STREAM	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025
OUTCOME 3: Water policy		**Country 1**	**1 & 2**	**1 & 2**	**2 & 3**	**3 & 4**	**3 & 4**	**4**
		Regional Policy Lead (40%)						
			External Affairs Coordinator for East Africa (20%)					
				External Affairs Coordinator for South Africa (20%)				
						External Affairs Coordinator for West Africa (20%)		
							External Affairs Coordinator (20%)	
		Global: Policy Analyst (25%)						
OUTCOME 4: Capacity-building	In-person training and coaching across three regions	**TRAINING ACROSS ALL REGIONS AND ANNUAL IN-PERSON CONFERENCES**						
		East Africa Regional Water Funds Director (80%)						
		South Africa Regional Water Funds Director (50%)		South Africa Regional Water Funds Director (80%)				
			West Africa Regional Water Funds Director (50%)		West Africa Regional Water Funds Director (80%)			
			Training and Knowledge Network Coordinator					
		Global: Economics Advisor (5% per Water Fund)						
	Online training and network	Global: Capacity-Building Advisor and IT support						
OUTCOME 5: Community of allies	Africa Source Water Protection Partnership		**AFRICA SOURCE WATER PROTECTION PARTNERSHIP**					
			SUMMIT		**SUMMIT**		**SUMMIT**	
				Source Water Protection Partnership Coordinator				
		Global: Global Water Funds Network Coordinator (30%), global corporate engagement support (30%)						
OVERALL STRATEGY SUPPORT (not reflected in individual outcomes)		Strategy Lead (50%), Spatial Analyst (25%), Communications Manager, M&E Director (20%), Corporate Engagement Lead (80%)						
		Global staff: Advisor (10%), Technical Support (10%), Communications Support (10%)						

Light blue indicates Global Water Team's personnel *Medium blue indicates Africa Region's personnel* *Dark blue indicates sequencing of major milestones*
(100% of full-time employee is assumed, unless indicated otherwise)

FINANCIAL PROJECTIONS

Table 6. Financial resource projections for TNC Africa's Protect Source Waters Strategy for July 2018 to June 2025

- Financial sustainability costs include endowments for individual water funds.
- Implementation costs include TNC personnel, contracts with partner organizations, and travel/sundry.
- Based on the Nairobi water fund experience, the total implementation costs leverage approximately 3:1 matching support from other institutions (mostly in-kind).

Fiscal Year	Financial Sustainability for Water Funds	IMPLEMENTATION COSTS							
		Total Implementation	Outcome 1: Water Funds Implementation	Outcome 2: Water-Sector Spending	Outcome 3: Water Policy	Outcome 4: Capacity-Building	Outcomes 5: Community of Allies	Regional Support	Indirect Costs of the Strategy
TOTAL	**16,000,000**	**53,077,099**	29,461,915	1,169,227	1,629,346	5,218,024	1,723,050	3,413,532	10,462,006
FY2019	2,000,000	5,556,416	3,223,443	76,500	121,400	598,200	60,000	381,650	1,095,223
FY2020	2,000,000	7,282,540	3,923,015	160,650	173,470	808,170	332,500	449,277	1,435,459
FY2021	4,000,000	8,426,295	4,845,325	168,683	234,294	891,701	155,150	470,240	1,660,904
FY2022	2,000,000	8,388,234	4,627,176	177,117	267,258	766,893	404,136	492,252	1,653,401
FY2023	2,000,000	7,960,879	4,544,418	185,972	268,341	709,639	167,978	515,365	1,569,166
FY2024	2,000,000	8,110,080	4,394,543	195,271	279,515	681,378	421,165	539,633	1,598,575
FY2025	2,000,000	7,352,655	3,903,996	205,035	285,068	762,043	182,121	565,115	1,449,279

APPENDIX 1: EXPANDING APPLICATION OF THE WATER FUND MODEL

SITUATION ANALYSIS

The water fund model is limited to places where the downstream water user is an urban water utility that can serve as the entry point for channeling resources to source water protection. However, there are numerous freshwater basins across Africa that are under severe threat and would benefit from source water conservation initiatives but that do not have a water utility as the primary beneficiary. Instead, the primary users are agricultural, energy, and tourism stakeholders. To implement conservation interventions in these contexts, new conservation investment programs will be developed by modifying the water fund model. Modification of the approach will be tested in four different basins, each with a different type of water beneficiary (Figure 1).

Figure 1. Basins under final assessment for implementation of source water protection mechanism. Sites under screening are undergoing initial spatial analysis; sites under scoping are undergoing a more advanced review to ground-truth the identified opportunity and projected impact at the location.

GOAL AND OUTCOMES

Goal: Source water protection mechanisms are established in four iconic basins and demonstrate the applicability of the water fund model in settings where the primary downstream beneficiary is not an urban utility.

Outcome 1: The Okavango River basin has a source water protection fund in place with science-based implementation underway, demonstrating adaptation of the water fund model in which globally important wildlife and tourism are the primary downstream beneficiaries.

Outcome 2: The provision of hydrologic ecosystem services for hydropower production in the Mbé-Komo River basins in Gabon are secured while protecting local livelihoods, economic productivity, and biodiversity conservation, through the existence of governance and financial mechanisms that guide investments and management interventions in the two basins.

Outcome 3: The Palmiet-Bot River basin will have a source water protection mechanism in place that addresses the current water security threats by adopting the water fund model in a context in which the downstream user is the agriculture sector.

Outcome 4: The Sebou River basin, in Morocco, has a partner-led source water protection fund in place with science-based implementation underway, demonstrating adaptation of the water fund model in which hydroelectric and agricultural industries are the primary downstream beneficiaries.

OKAVANGO RIVER: ANGOLA, NAMIBIA, BOTSWANA

SITUATION ANALYSIS

The Okavango River watershed (Figure 2) is a transnational basin that covers an area shared by three countries — Angola, Namibia, and Botswana. The headwaters rise in the highland plateau of Angola and descend through sub-humid and semiarid rangeland before concentrating the flow along the border of Angola and Namibia and spilling into the Okavango delta, one of the largest freshwater inland wetlands in the world. It is a globally important ecosystem that supports Africa's largest elephant population and the livelihoods of 600,000 people. The river is still healthy and the riparian habitat along the tributaries remains relatively intact. However, pressure from energy needs and agricultural expansion are rising.

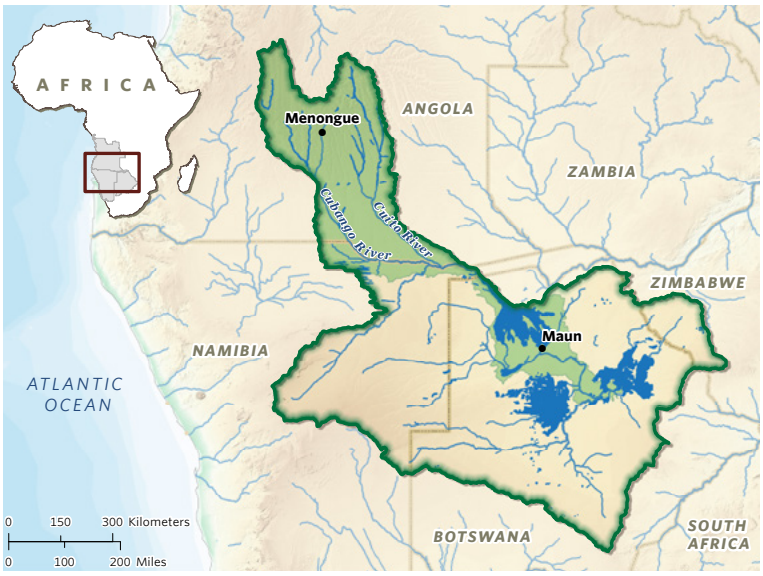

Figure 2. Okavango River basin (~700,000 km^2).

KEY PARTNERSHIPS FOR SOURCE WATER PROTECTION

The entry point for working in the Okavango River watershed is the Permanent Okavango River Basin Commission (OKACOM, est. 1994), a treaty between Namibia, Angola, and Botswana, whose primary interest is to reduce conflict over access to water and riparian resources and to promote joint management of the waters of common interest. OKACOM requested TNC's support in developing a fund for the basin using a modification of the water fund model. In this basin, modification of the water fund approach is needed because the primary downstream beneficiary is not a water utility but the tourism industry and large water users, such as the irrigation sector in Namibia.

OKACOM's steering committee members began the collaboration with TNC by taking the 2017 and 2018 water fund course and signing a memorandum of understanding between TNC and OKACOM in August 2018. Expected long-term collaboration for source water protection focuses on launching a fund for protection and livelihood development in the basin (with a likely focus on the Angolan portion of the basin), which will have a hybrid structure consisting of a sinking and an endowment fund for source water protection. The Nature Conservancy will lead the development of the business case for this fund, participate in the governance of the fund if invited by the partners, and provide technical support during implementation. It is expected that some capital for the fund will be provided by large tourism operators in Okavango (e.g., safari companies) and other large downstream water users.

TNC will also explore the potential for the emerging partnership with Okavango-Zambezi water tower, which can serve as a vehicle for source water protection in the Upper Cuito and Upper Cuando portion of the Okavango River basin while benefiting other key river systems in the region. To that end, TNC will create a business case for Okavango-Zambezi water tower protection and community-based conservation efforts as a step toward implementation through the OKACOM Basin Fund or another source water protection vehicle.

The ultimate outcome of the financing mechanisms and the multinational partnerships is to create a good management structure for the Okavango headwaters that is resilient to climate change and human pressures over time and sustains the critical water flow to the delta.

RESEARCH AND TRADE-OFF ANALYSES

While TNC is partnering with OKACOM as the critical transnational organization in the water sector, TNC will also evaluate which source water protection approaches are likely to be most effective in the Angola headwaters. In partnership with the Angolan government and NGOs, TNC will determine how economic development can be coupled with source water protection through interventions, such as conservation agriculture, nature-based tourism, irrigation efficiency, community forestry, and targeted protection. TNC will also work with the Angolan government and other stakeholders to develop alternatives to current long-range water and energy infrastructure plans. The aim is to chart a sustainable pathway that meets the ecosystem service and economic needs of the basin and can be supported by key decision-making and financial institutions.

MBÉ RIVER BASIN: GABON

SITUATION ANALYSIS

The Mbé River basin (Figure 3) is one of Gabon's most economically important watersheds, given the two hydropower facilities that provide 700 GWh/year of electricity and power. This amount of energy powers half of the needs of the capital's (Libreville) urban population and its industrial footprint. However, with energy demand growth hovering around 10%, the unmet gap between supply and demand is increasing. The country plans to develop new hydropower facilities as a more sustainable and climate-friendly approach to produce energy, instead of installing more thermal plants. Two new hydropower facilities are currently under study for the Mbé and the adjacent Komo basins.

The forests and rivers of these two basins harbor some of the most biodiverse habitats in Central Africa. Despite the contribution of ecosystem services of the Mbé and Komo watersheds to rural livelihoods and the national economy, the basin has been poorly managed, affecting water quality and reliability of consistent water flows. For example, significant portions of the forests have been given in concession to forestry operators, which for the most part follow unsustainable extraction methods. These methods deteriorate the rivers and put at risk the profitability of the current and projected hydropower production downstream, according to the recent (2017) study done by TNC and FutureWater.

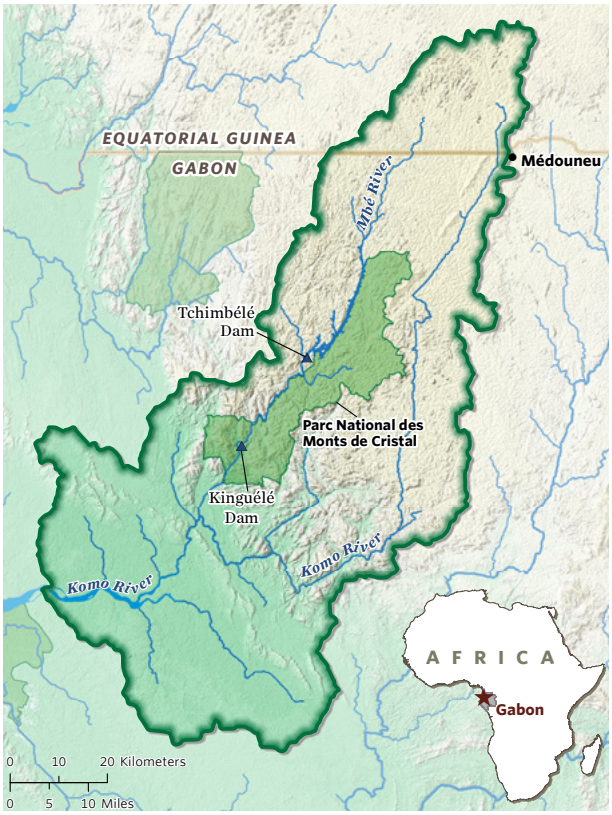

Figure 3. Mbé-Komo basin (~2,000 km^2).

KEY PARTNERSHIPS FOR SOURCE WATER PROTECTION

Given the economic benefits of the Mbé and Komo rivers, the entry points for working in these basins are stakeholders in the hydropower industries, the forestry industry, and the Ministry of Environment. It is envisioned that by demonstrating the business case for implementing sustainable basin planning and land use practices, relevant stakeholders will apply the conservation methods and help to avoid further deterioration of the watershed.

RESEARCH AND TRADE-OFF ANALYSES

Initial detailed spatial and ecological assessments and business cases for interventions will be developed. Recommended approaches for basin development will target both (1) basin-scale methods, such as application of sustainable hydropower planning and best management practices for forestry and agriculture expansion; and (2) community-based interventions that empower and equip communities — particularly women and youth — to effectively manage their freshwater resources while protecting the biodiversity and ecosystem services of the Mbé and Komo rivers.

Additional analyses will be done to provide Gabon's leaders scientific and technical expertise to help guide natural resource management decisions that will shape the future of the country's environment over the next decade, improve livelihoods, and sustain the energy supply for the country's economic growth.

PALMIET-BOT RIVER/OVERBERG BASIN: SOUTH AFRICA

SITUATION ANALYSIS

The Overberg region is located in the Western Cape Province of South Africa between the Hottentots-Holland mountain range in the west, the Riviersonderend Mountain in the north, the Breede River in the east. The region contributes significantly to the GDP of the Western Cape through agriculture and tourism, and it includes important conservation areas, such as the Kogelberg Biosphere Reserve, Agulhas Plain National Park, De Hoop Nature reserve, and important wetlands, estuaries, and marine-protected areas.

The Palmiet-Bot basin (Figure 4) of the Overberg region comprises two river systems:

1. Palmiet system — Supports the Palmiet Pumped Storage scheme, largely situated within the Kogelberg Nature Reserve, as well as several irrigation dams and a hydropower scheme. This river is also of strategic importance to the Greater Cape Town Region, as it is part of the Western Cape Water Supply System.
2. Bot system — Flows into the Botvlei, a Ramsar site, and supports an important agricultural area, local communities, and several small municipalities.

Figure 4. Palmiet-Bot basin (~500 km^2).

The Palmiet-Bot basin faces several threats, including land use change, population growth, development pressure, increased water demands, invasive plant infestation, over-abstraction, river modification, and runaway wildfires. These threats decrease the ability of the basin to support long-term water security of towns and local communities, increase sedimentation, and affect the natural functioning of the Bot River estuary (Botvlei). The prevailing drought, predictions of changing climatic conditions, and associated decrease in rainfall elevate the importance of addressing the long-term water security threats. Severe water shortages affect the agricultural production, lead to job losses, and threaten regional stability.

KEY PARTNERSHIPS FOR SOURCE WATER PROTECTION

The Overberg Fire Protection Agency, Agulhas Biodiversity Initiative (a landscape initiative), and NGOs (Fynbos Trust and Flower Valley Trust) have requested TNC's support to find natural solutions for long-term water security and livelihood improvement. The Overberg region provides an opportunity for adapting the water fund model to address water security threats of a basin whose primary downstream user is the agriculture sector (related industries such as Kromco, Appeltiser).

RESEARCH AND TRADE-OFF ANALYSES

TNC will work with key stakeholders to conduct a detailed analysis of the water security threats in the Overberg region, determine the strategically important water source areas, develop a source water protection framework to improve basin management, and unlock long-term, sustainable funding to address water quantity and quality issues in the region. Opportunities for community-based conservation that empower and equip communities — particularly women and youth — to effectively manage their freshwater resources will also be assessed.

SEBOU RIVER BASIN: MOROCCO

SITUATION ANALYSIS

Establishment of a sustainable mechanism to protect the Sebou River basin (Figure 5) is urgent given the government's proposal to develop 60 large and 1,000 medium-size dams across the country, as well as the projection that Morocco will double its agricultural production within the next 15 years. The Green Water Credits study completed in 2011 by the International Soil Reference and Information Center in partnership with FutureWater found that investing in the conservation of the Sebou River basin by supporting upstream communities to undertake source water protection practices would be profitable.

Figure 5. Sebou River basin (~40,000 km^2).

KEY PARTNERSHIPS FOR SOURCE WATER PROTECTION

TNC will support source water protection in the Sebou basin through the partnership with the World Wildlife Fund (WWF). Since the publication of the green water credits study, the WWF, in collaboration with MAVA Foundation and the Coca-Cola Foundation, assessed TNC's approach to payments for ecosystem services through the implementation of water funds. The WWF team attended TNC-hosted Africa Water Funds training in November 2017 and approached TNC with a request to assist with the design of a suitable mechanism for conservation interventions in the Sebou basin. WWF has also successfully sought endorsement for the water fund from the Morocco Water Coalition, comprising water management and regulatory agencies, and from major private-sector corporations through the General Confederation of Morocco Enterprises. WWF will continue to lead the mobilization and consolidation of conservation efforts for the Sebou River basin, and TNC will offer technical, advisory, and training capacity.

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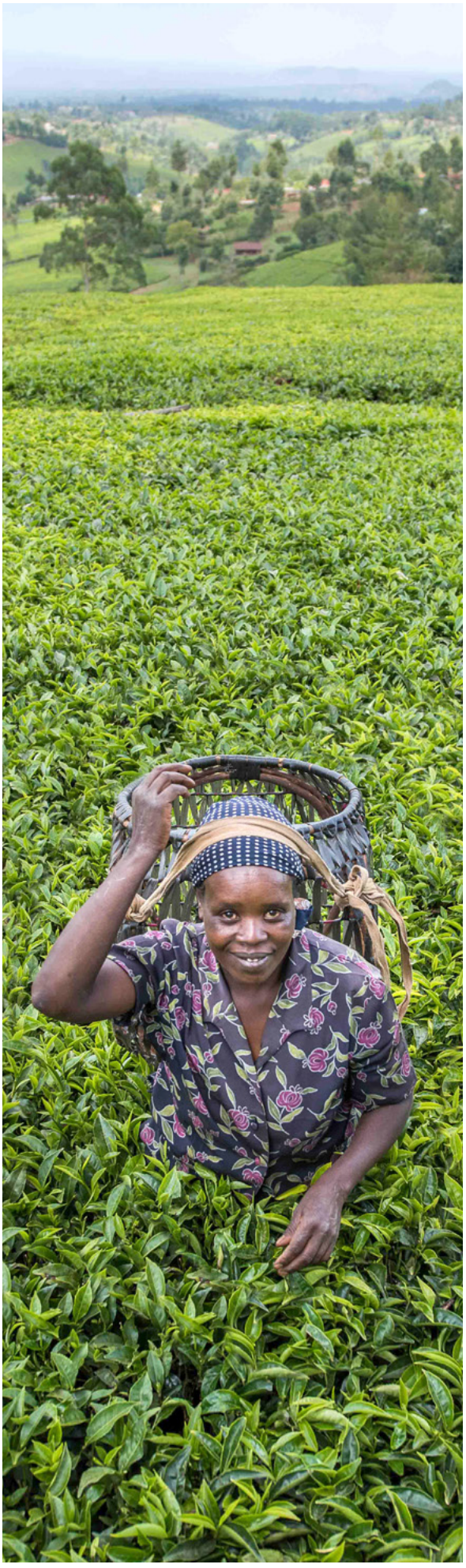

PROTECT SOURCE WATERS STRATEGY

Unsustainable land use practices impact the availability, reliability, and quality of water flows on which people, wildlife, and ecosystem services depend. Our strategy is designed to foster replication of public-private partnerships that proactively invest in restoring and securing priority watersheds while benefiting rural communities.

TNC AFRICA STRATEGIES

All of TNC's work in Africa aligns with one of these seven strategies:

- Protect Integrated Landscapes
- Expand Ocean Protection and Resilience
- Protect Source Waters
- Power Africa Sustainably
- Sustainably Intensify Agriculture
- Improve Fishery Health
- Conserve and Restore Working Forests

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