LANDSCAPE APPROACHES TRAINING SERIES

Session 1: Overview of Natural Capital Approaches and Tools

THE WORLD BANK
Environment, Natural Resources & Blue Economy

GPS Global Program on Sustainability

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Anne works to magnify NatCap's impact and ensure achievement of strategic goals, and oversees communications, capacity-building, and convenings for NatCap. She also leads NatCap's Sustainable Livable Cities efforts and co-leads its marine and coastal work. She is fascinated by the relationship between people and nature and believes that cutting-edge science, engagement with leaders of all sorts, software tools, art, poetry, and more can be used to understand and enrich that relationship.

learning objectives

- Understand and explain the different types of Natural Capital Approaches.
- Understand and apply each of the steps of the Natural Capital Assessment framework.
- Analyze how each of the Natural Capital Approaches can be used to inform policy and financial decisions.

about our workshop

There is a growing literature on inclusive wealth that utilizes a capitals framing to explore the contribution of different types of capital towards human wellbeing. These include manufacturing, social, natural and human capital. Natural capital stocks result in flows of ecosystem services, and any changes in the value of these ecosystem services lead to a change in benefits to people. This session provides an overview of the Natural Capital Approach (NCA) which includes Natural Capital Assessments and Natural Capital Accounting. Natural Capital Assessments quantify and map stocks of natural capital and flows of ecosystem services to people. Using the Upper Tana Water Fund in Nairobi, Kenya as an example, the session provides an insight into the Natural Capital Assessment process and provides a framework and relevant tools for measurement.

Keywords: Natural Capital Approach, ecosystem services, water fund

Introduction to Natural Capital Approaches

Anne Guerry
GPS workshop on Natural Capital
Zambia, June, 2022

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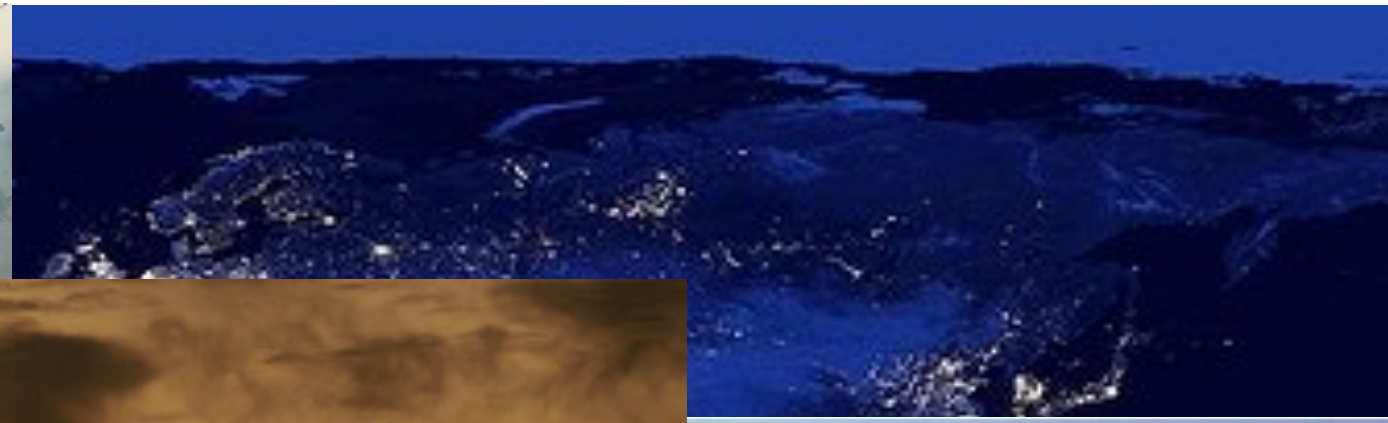
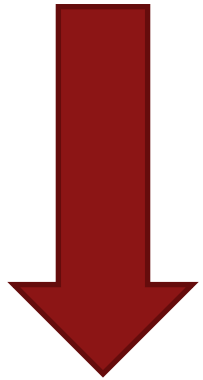
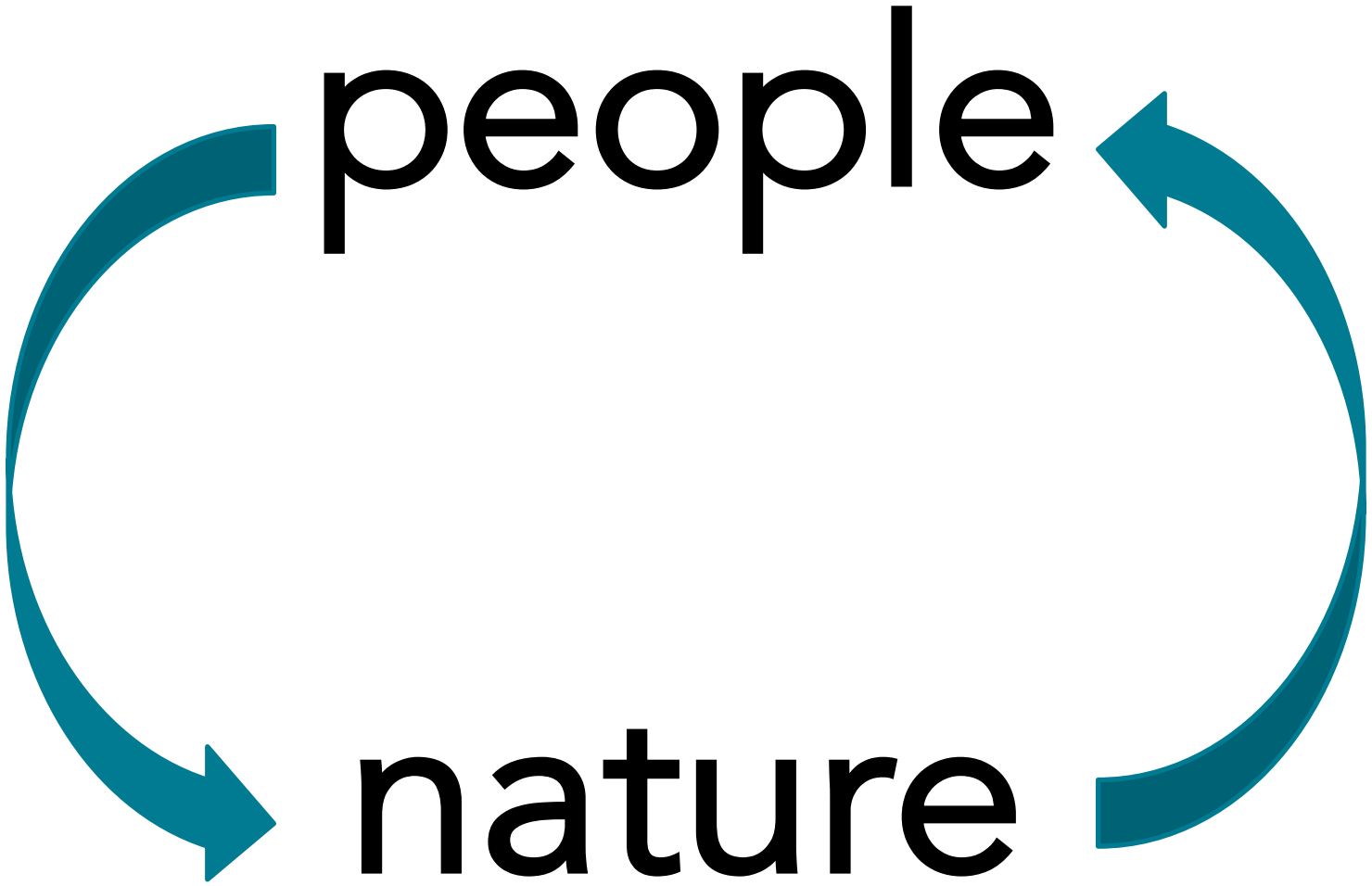
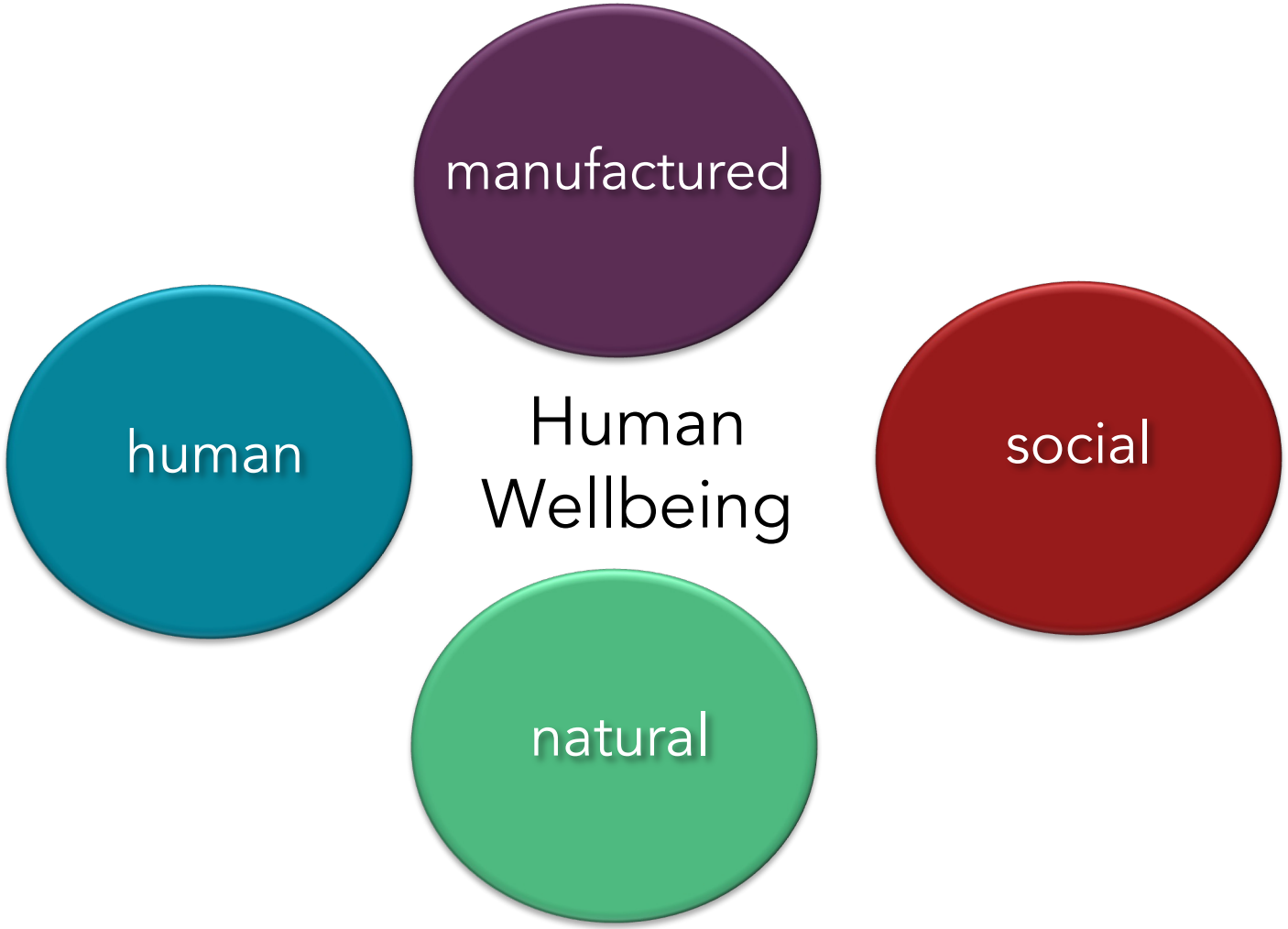


people



nature


people
nature



World Bank 2011
Polasky et al. 2015

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Food, fuel, fiber

Pollination

Climate regulation

Clean water

Coastal protection

Spiritual Fulfilment

Change in environment → change in benefits

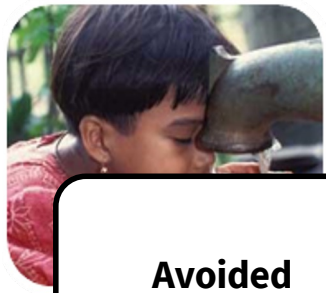
Alternative management, policy → Δ Ecosystem structure → Δ Ecosystem function → Δ Ecosystem service → Δ Ecosystem service value

Riparian restoration decision

Streamside habitat area

Water filtration & retention

Nutrient load in stream



Avoided treatment cost

People affected

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Pioneering science, technology, and partnerships that enable people and nature to thrive.

Stockholm Resilience Centre
Sustainability Science for Biosphere Stewardship

Stockholm University

INSTITUTE ON THE ENVIRONMENT

UNIVERSITY OF MINNESOTA
Driven to Discover℠

CHINESE ACADEMY OF SCIENCES

The Nature Conservancy

WWF

Integrate the values of nature into decisions

motivate greater, more targeted investments in nature

improve the well-being of people and nature

Natural Capital Approaches

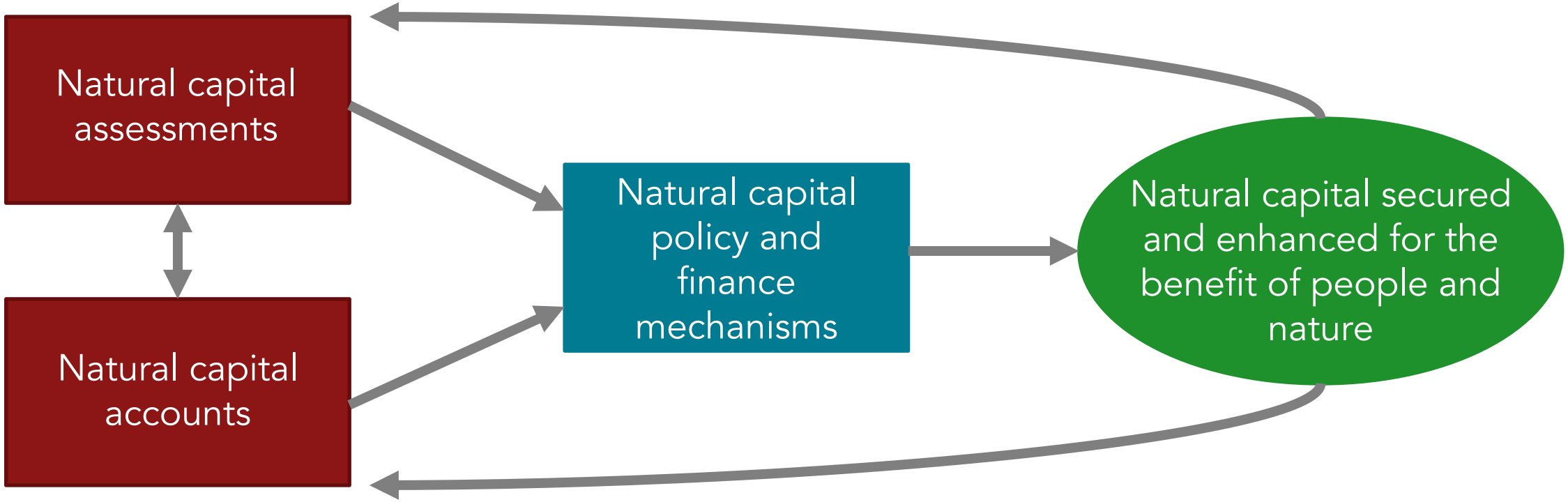
1. Natural capital assessments

- Quantify and map stocks of natural capital and flows of ecosystem services to people
- Use multiple metrics (qualitative, quantitative, and/or monetary)
- Consider overall as well as distributional effects on people
- Take many forms, including evaluation of past performance, exploration of future scenarios, optimization of decisions, and assessments of policies.

2. Natural capital accounts

- Track current stocks of natural capital, flows of ecosystem service benefits and their change over time
- Use a standardized, replicable approach
- Can include both biophysical and monetary metrics

Natural capital approaches inform *policy and finance mechanisms* designed to secure and enhance natural capital and human wellbeing



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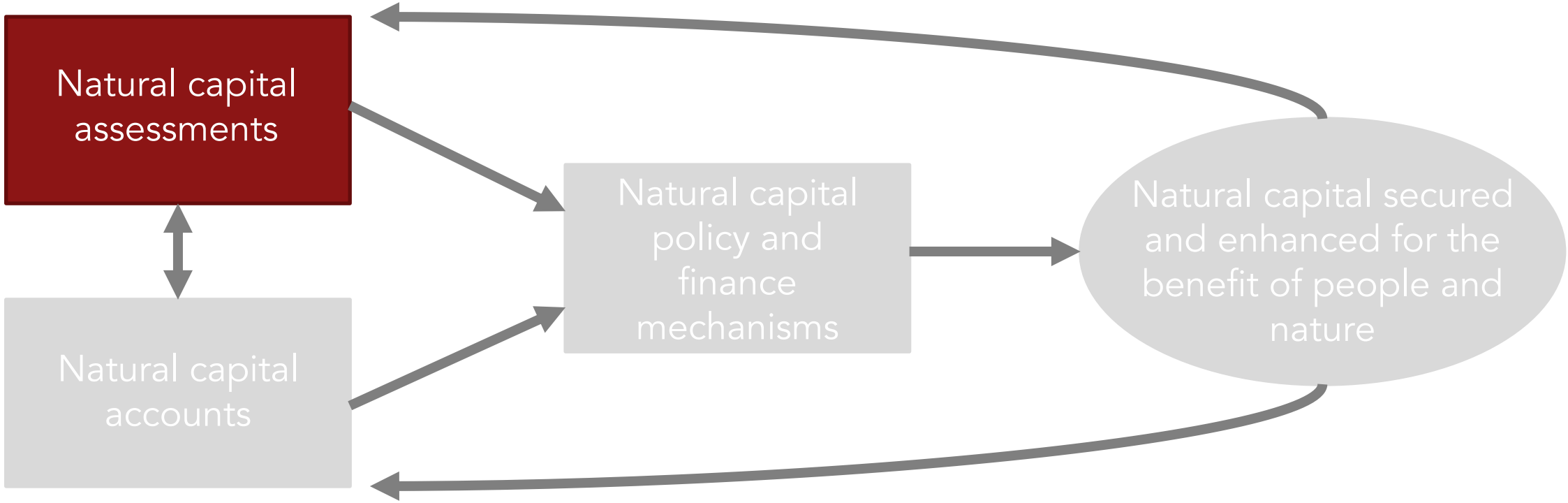
Natural Capital Policy and Finance Mechanisms

- Spatial planning and zoning
- Government payments/subsidies
- Regulatory mechanisms
- Water funds
- Market-based mechanisms (eco-certification, impact investing, insurance, voluntary carbon offsets, etc.)
- Multilateral and bilateral mechanisms (debt-for-nature swaps, REDD+ funding through Global Climate Fund, etc.)



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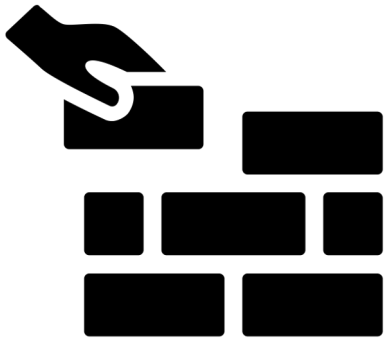
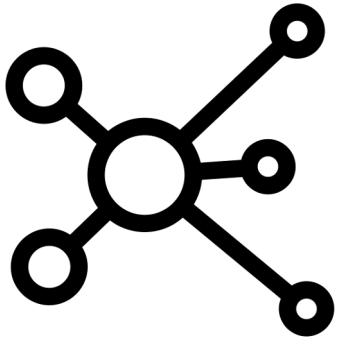
A Framework for Natural Capital Assessments

1



BUILD A SOLID FOUNDATION

2

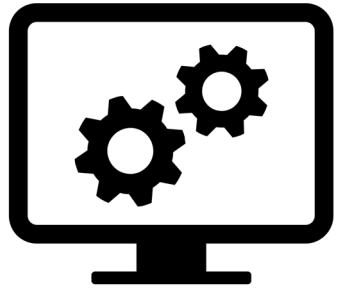


LEVERAGE RESOURCES, COMPILE DATA & INFORMATION

3

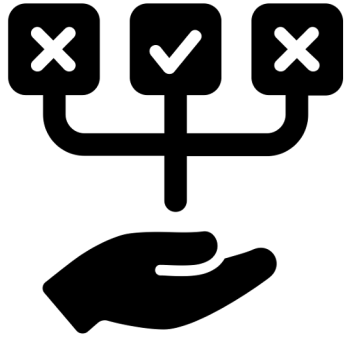
ASK QUESTIONS, EXPLORE OPTIONS

4

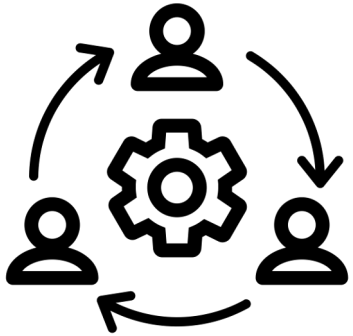


ANALYZE & SYNTHESIZE

5



INTERPRET RESULTS & INFORM DECISIONS



EVALUATE & ITERATE

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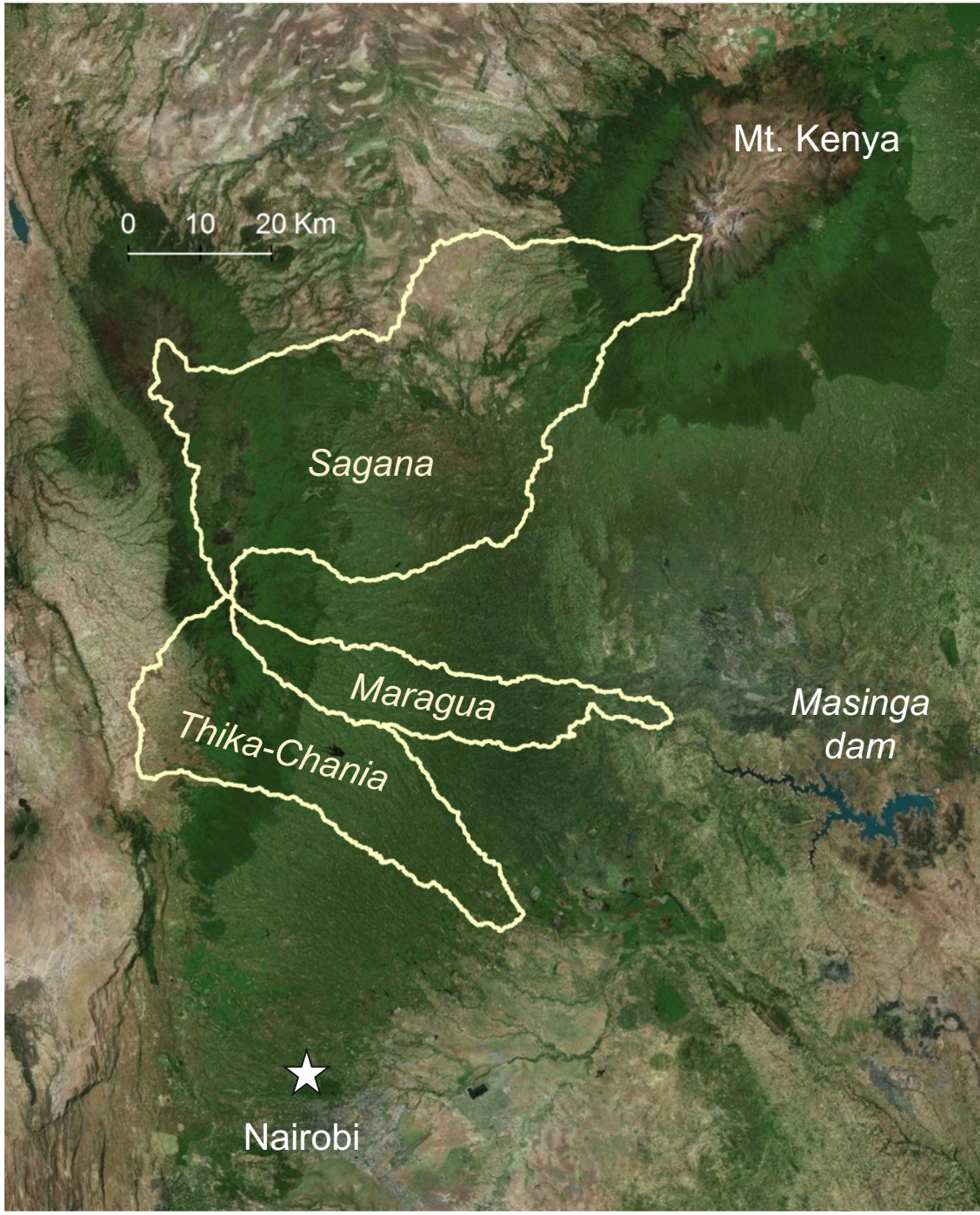
Upper Tana – Nairobi Water Fund

- Drinking water for 4 million people, 60% of Nairobi's energy
- Problems with soil loss → declining yields, impacts to utilities
- Major stakeholders: KenGen, Nairobi Water
- Objectives: Improve ***erosion control*** and ***dry season baseflow***
- ***Our job:*** Where to do watershed management? And what's the ROI?



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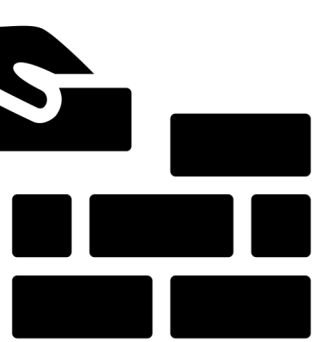

BUILD A SOLID FOUNDATION

Work together with key stakeholders to establish project goals and co-create a shared vision for the assessment.

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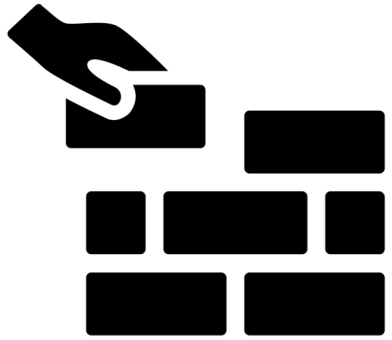

BUILD A SOLID FOUNDATION

- What are the key questions and decisions?
- What are the most important issues?
- What is the geographic area of interest?
- Are the right participants involved?
- Does the team have the right capacity?

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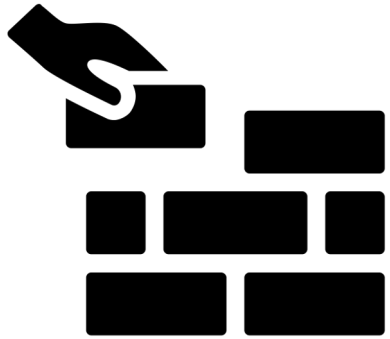


BUILD A SOLID FOUNDATION

Upper Tana Water Fund

- What are the key decision questions?

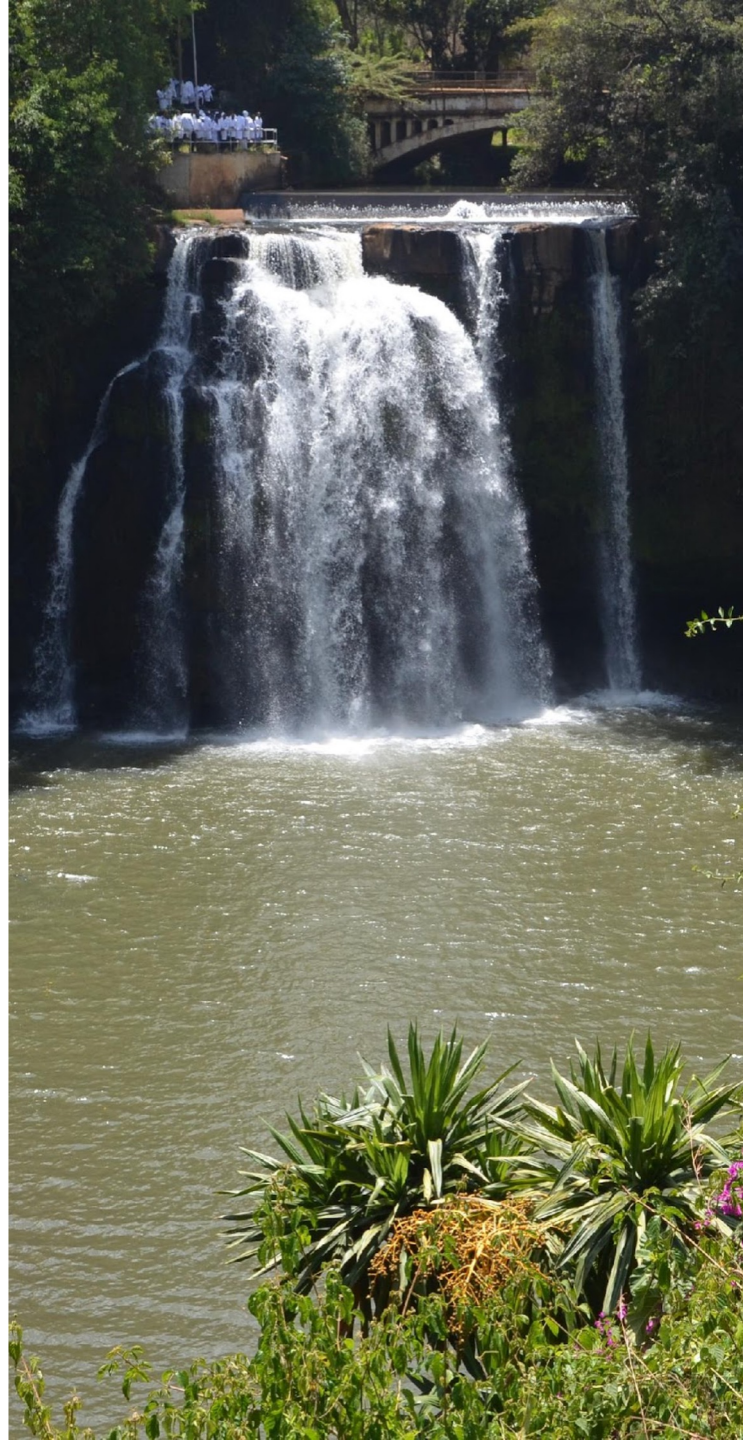
Is there a business case for creating a water fund?

- Are we addressing the most important issues?

Improving drinking water and power supply for Nairobi

- What is the geographic area of interest?

3 watersheds providing most of the drinking water/power for Nairobi and supporting major agricultural areas



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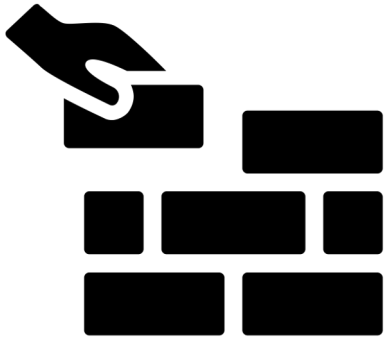
Upper Tana Water Fund



BUILD A SOLID FOUNDATION

- Are the right participants involved?

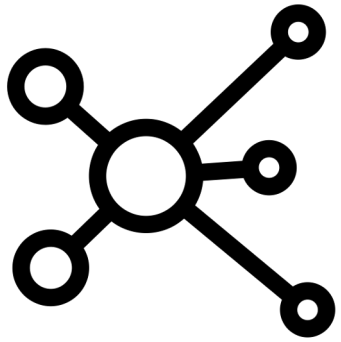
  KenGen, Nairobi Water, Green Belt Movement, WRMA, TNC, CIAT, FutureWater, NatCap…

- Does the team have the right capacity?

  Decision-makers, users, local knowledge and experience, science guidance, data, GIS skills, coordination…

Stakeholder workshops, field visits, data sharing…

2



LEVERAGE RESOURCES, COMPILE DATA & INFORMATION

Connect with local knowledge, leverage key resources--from satellite imagery to socioeconomic information--to compile data that meets project objectives

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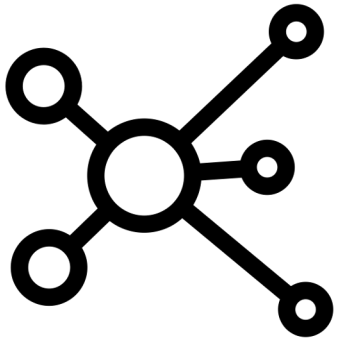
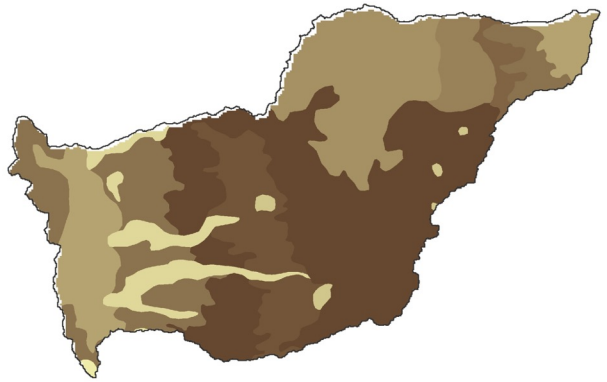


LEVERAGE RESOURCES, COMPILE DATA & INFORMATION

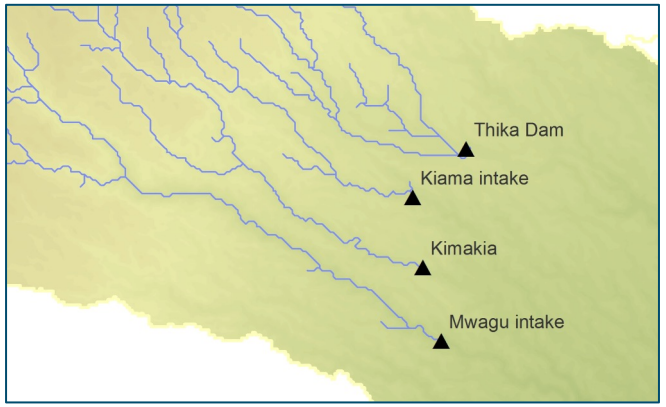
- Goal: best available
- Partners, government, previous studies…
- Can start with global datasets
- Cite your sources as you go along

Upper Tana Water Fund



LEVERAGE RESOURCES, COMPILE DATA & INFORMATION

- Mix of local and global data
- FutureWater provided many GIS layers
- TNC created land cover map
- Literature search for some values
- Valuation data from utilities



description	sed_exp	sed_ret	rough_rank	cover_rank
Urban and paved roads	0.99	0.2	0.011	0.1
Bare soil and unpaved roads	1	0.26	0.02	0.16
Grass	0.034	0.845	0.13	0.3
Shrub	0.128	0.505	0.4	0.5
General agriculture	0.412	0.84	0.09	0.39
Tea	0.08135	0.84	0.3535	0.883
Coffee	0.4393	0.84	0.276	0.45
Mixed forest	0.025	0.7375	0.6	0.91

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3

ASK QUESTIONS,
EXPLORE OPTIONS

Explore possibilities for different decisions and locations where investments in nature could have the biggest impact

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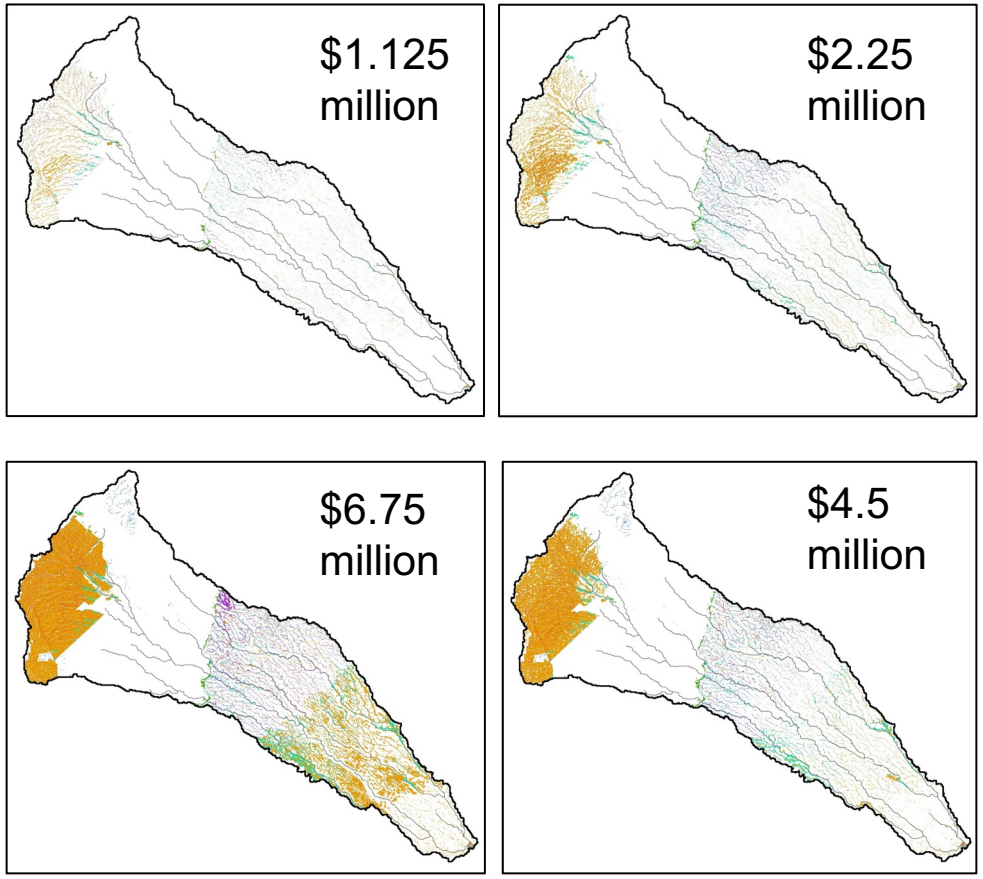
Upper Tana Water Fund

ASK QUESTIONS,
EXPLORE OPTIONS

Management Activities:

- Agroforestry
- Grass strips
- Terracing
- Riparian management



3 Watersheds
4 Budget levels

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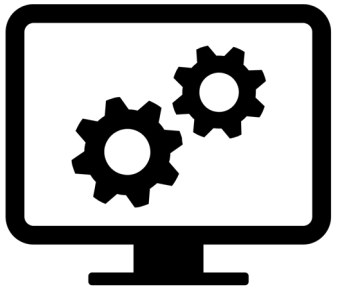
4



ANALYZE &
SYNTHESIZE

Using InVEST software or other modeling tools, map how investments or policies will impact ecosystems and human wellbeing

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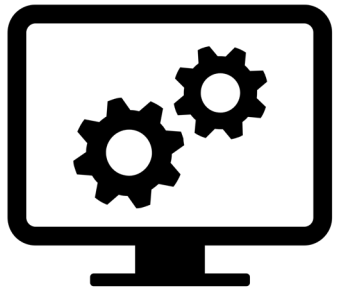

ANALYZE &
SYNTHESIZE

InVEST
integrated valuation of ecosystem services and tradeoffs

ARIES

- Quantify ES supply
- Determine who benefits
- Visualize changes across the landscape
- Many tools available, from simple to complex

SWAT Soil & Water Assessment Tool

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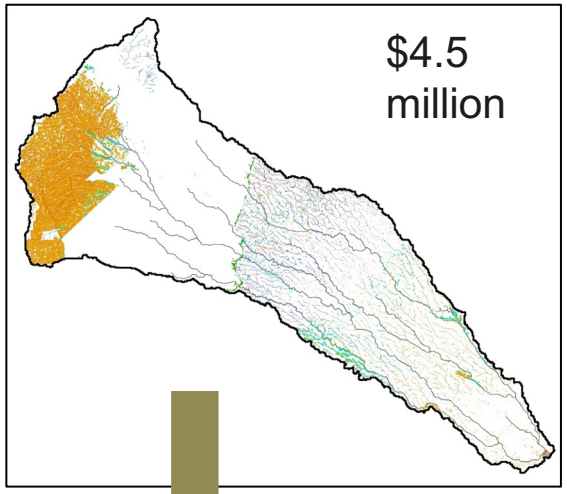
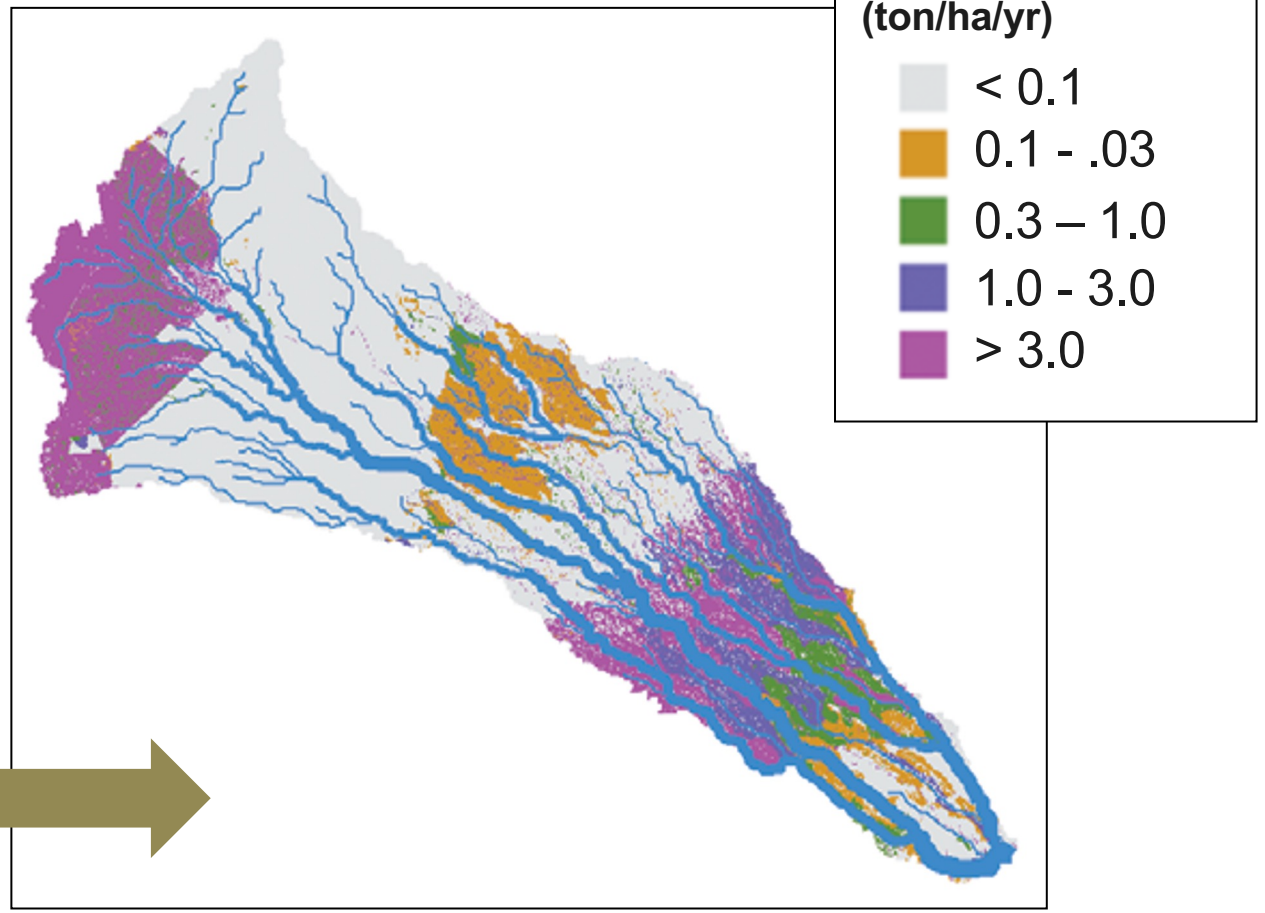
Upper Tana Water Fund

ANALYZE & SYNTHESIZE



SWAT Soil & Water Assessment Tool



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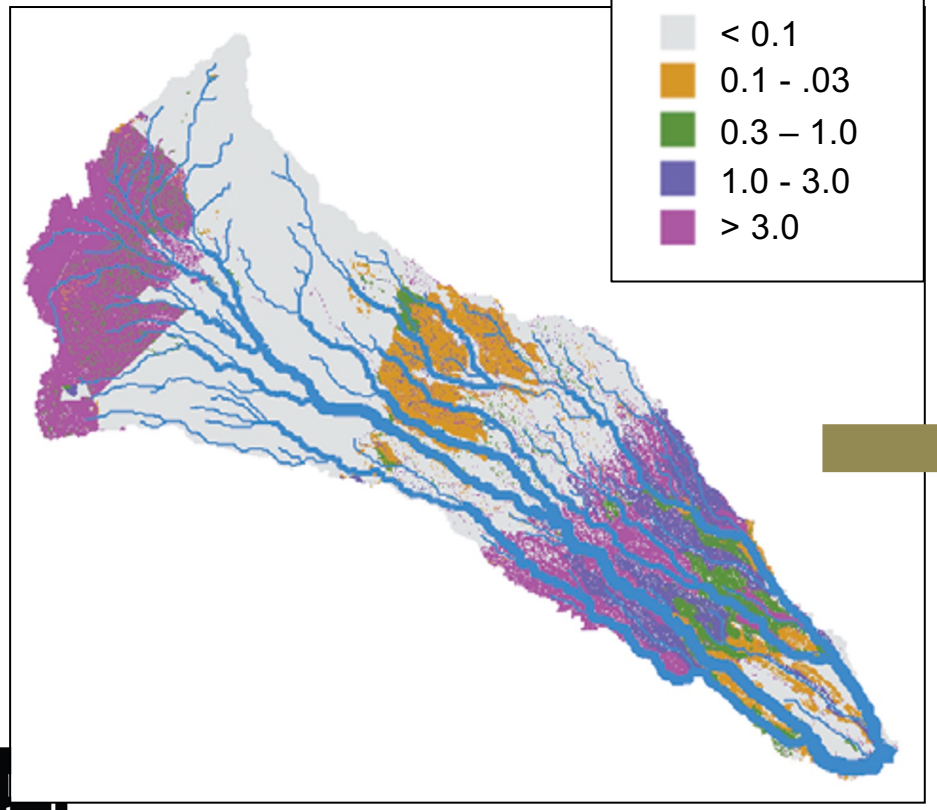
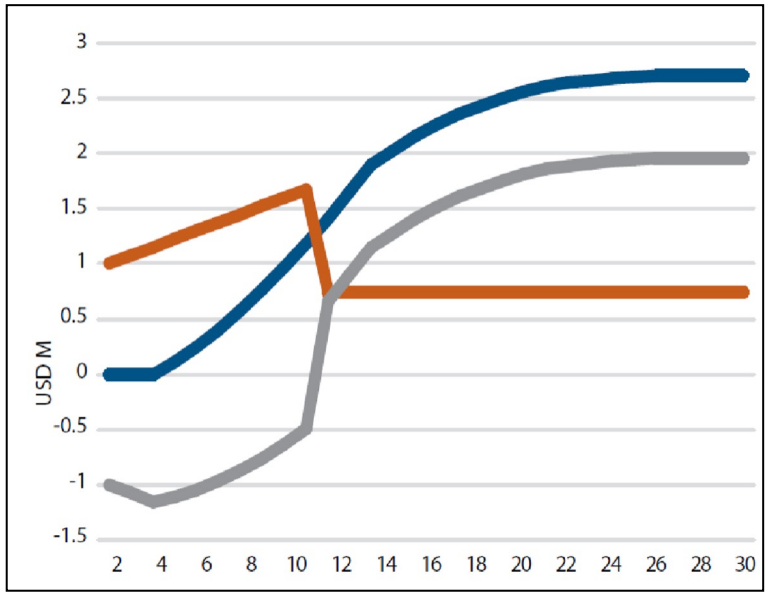
ANALYZE & SYNTHESIZE





Benefits to ***Farmers + Nairobi Water + KenGen***

$10M investment → $21M economic benefits

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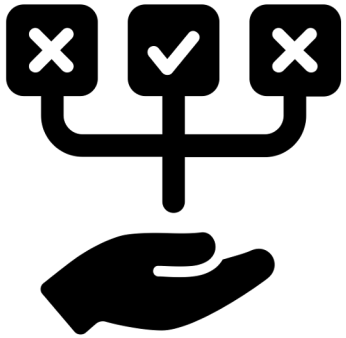
5



INTERPRET RESULTS
& INFORM
DECISIONS

Integrated teams review results, incorporate new information to improve accuracy, identify policy and investment implications

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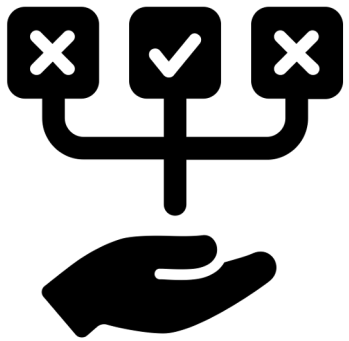

INTERPRET RESULTS
& INFORM
DECISIONS

- Visualize results
- Compare scenarios
- Consider tradeoffs
- Tailored to audience

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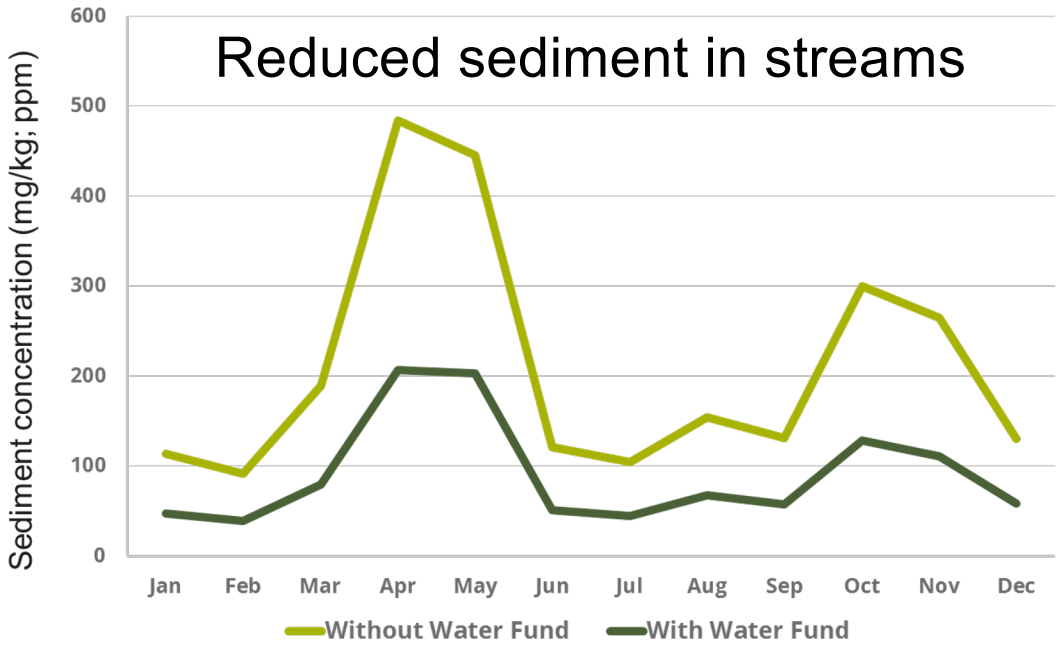
Upper Tana Water Fund

INTERPRET RESULTS & INFORM DECISIONS

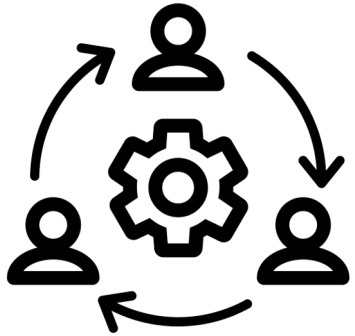
Useful for utilities →



Reduced sediment by landcover type

(In thousand tons)	Degraded land	Coffee	General agriculture	Tea	Unpaved road	Total
Sagana-Gura	-3	-55	-131	-3	-20	-212
Maragua	-142	-100	-54	-1	-100	-399
Thika-Chania	-54	-81	-179	-1	-127	-442

← *Useful for farmers*



EVALUATE &
ITERATE

Do these results make sense based on mutual understanding? What worked? What can we improve? What changes will lead to desired improvements?

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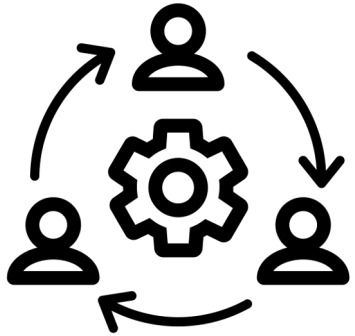
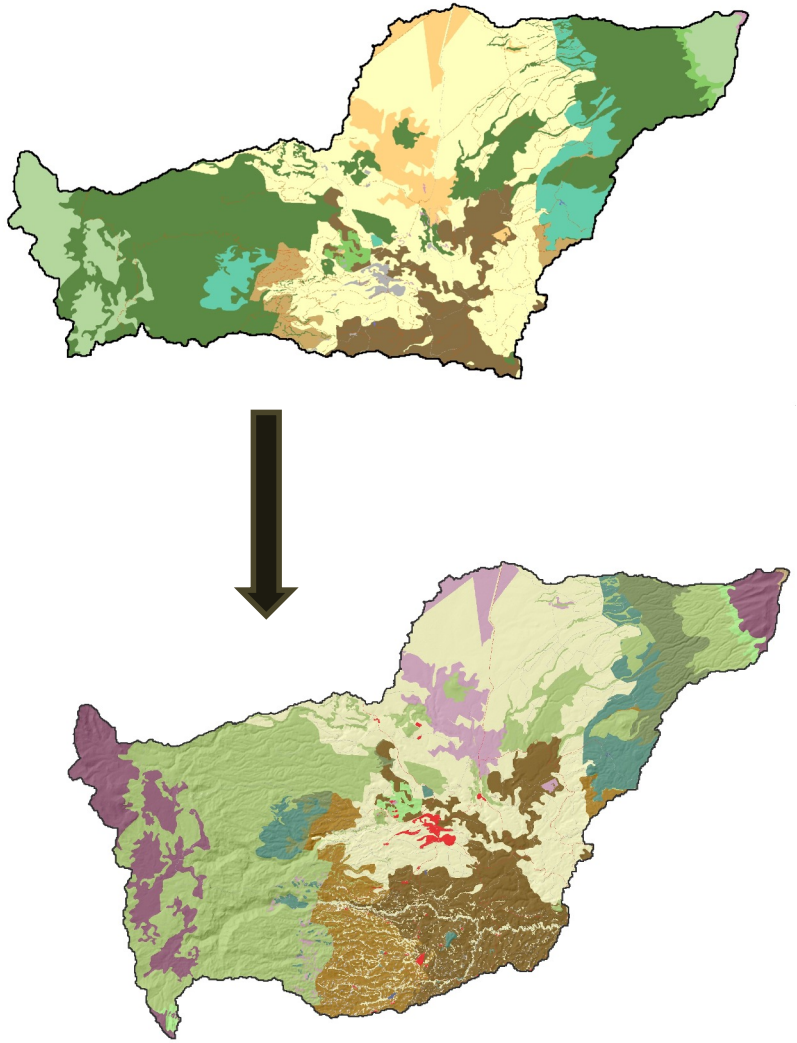


EVALUATE &
ITERATE

Upper Tana Water Fund



Several iterations based on stakeholder and partner feedback

- Cost information from stakeholders
- Refinements to activities and land cover from talking with locals

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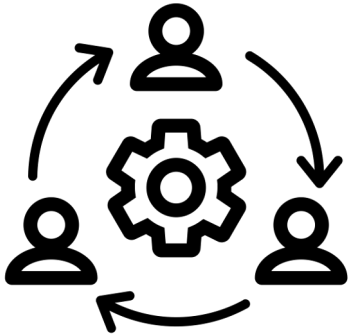
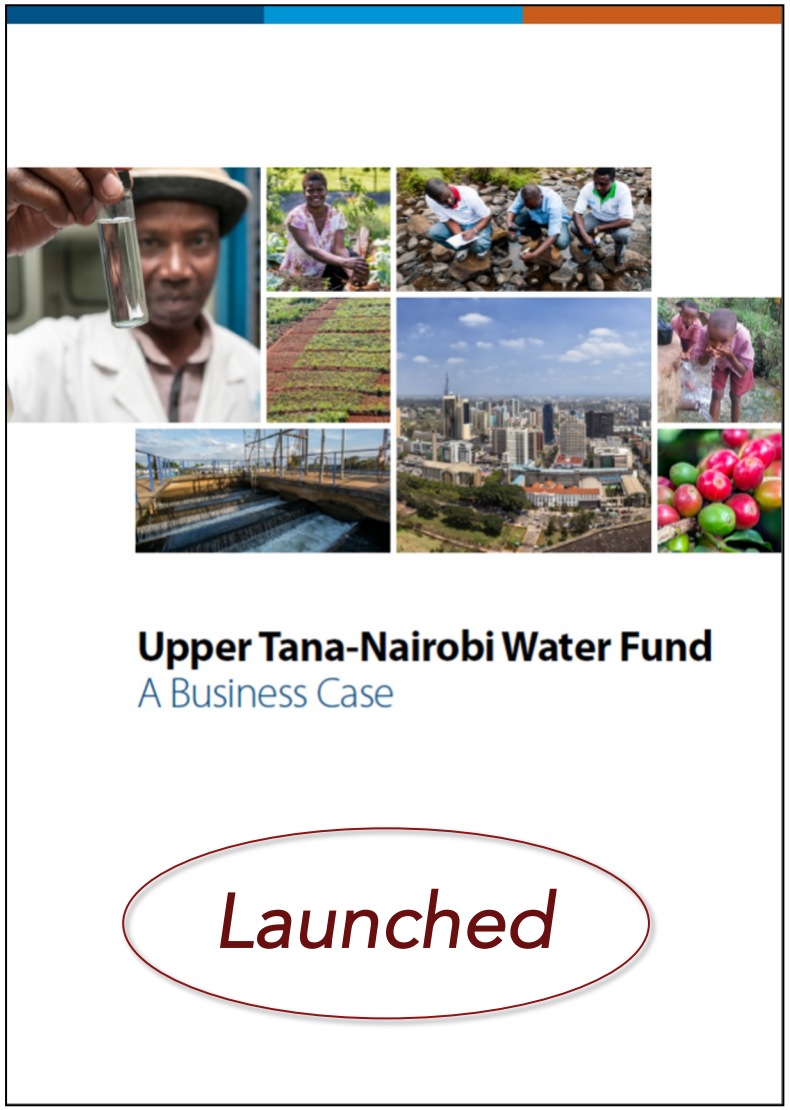


EVALUATE &
ITERATE

Upper Tana Water Fund

Tools/methods training in Nairobi



Launched

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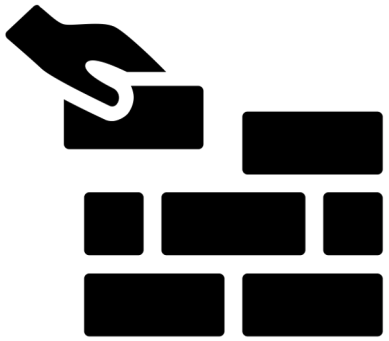
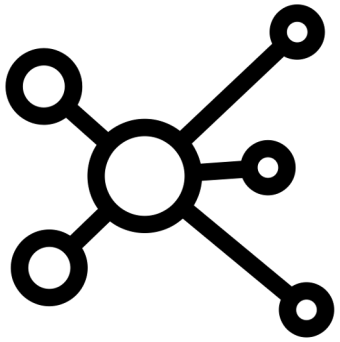
1



BUILD A SOLID FOUNDATION

2

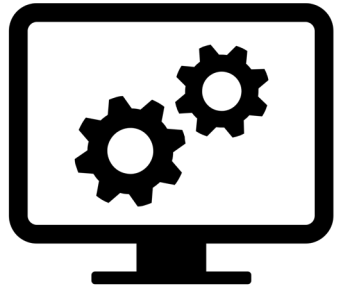


LEVERAGE RESOURCES, COMPILE DATA & INFORMATION

3

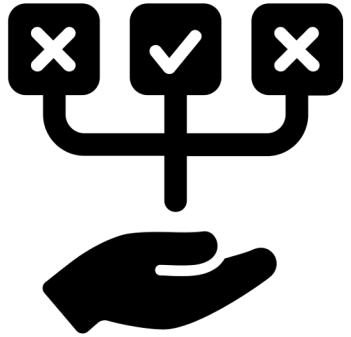
ASK QUESTIONS, EXPLORE OPTIONS

4

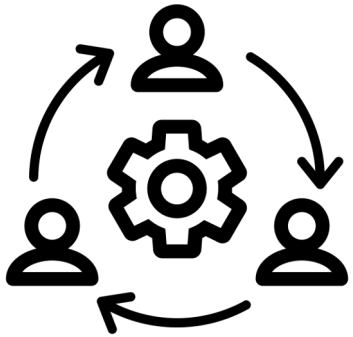


ANALYZE & SYNTHESIZE

5



INTERPRET RESULTS & INFORM DECISIONS

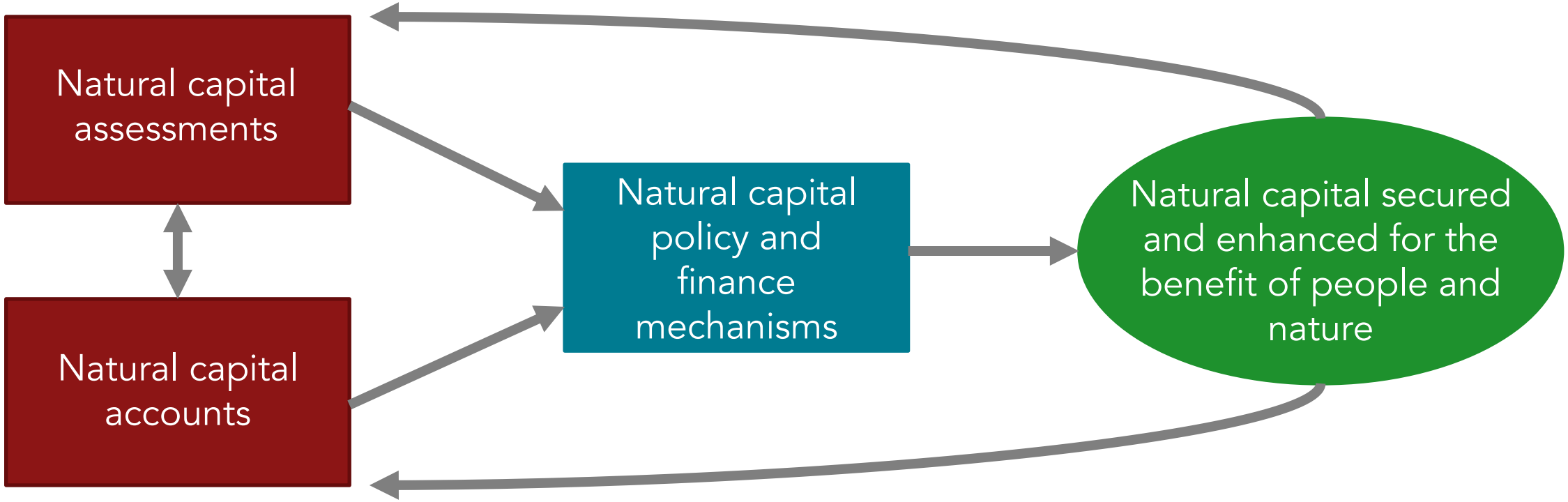


EVALUATE & ITERATE

natural capital PROJECT

Stanford University

Natural capital approaches inform *policy and finance mechanisms* designed to secure and enhance natural capital and human wellbeing



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Natural Capital Policy and Finance Mechanisms

- Spatial planning and zoning
- Government payments/subsidies
- Regulatory mechanisms
- Water funds
- Market-based mechanisms (eco-certification, impact investing, insurance, voluntary carbon offsets, etc.)
- Multilateral and bilateral mechanisms (debt-for-nature swaps, REDD+ funding through Global Climate Fund, etc.)

natural capital PROJECT

Pioneering science, technology, and partnerships that enable people and nature to thrive.

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