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Forest Trends' Ecosystem Marketplace
ACES Conference | December 11, 2014

QUANTIFYING THE BENEFITS OF WATERSHED INVESTMENT

Findings from the *State of Watershed Investment 2014*

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

PROFOR

The Grantham Foundation for the Protection of the Environment

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ECOSYSTEM MARKETPLACE: Global source of news, data and analytics around environmental markets and payments for ecosystem services.

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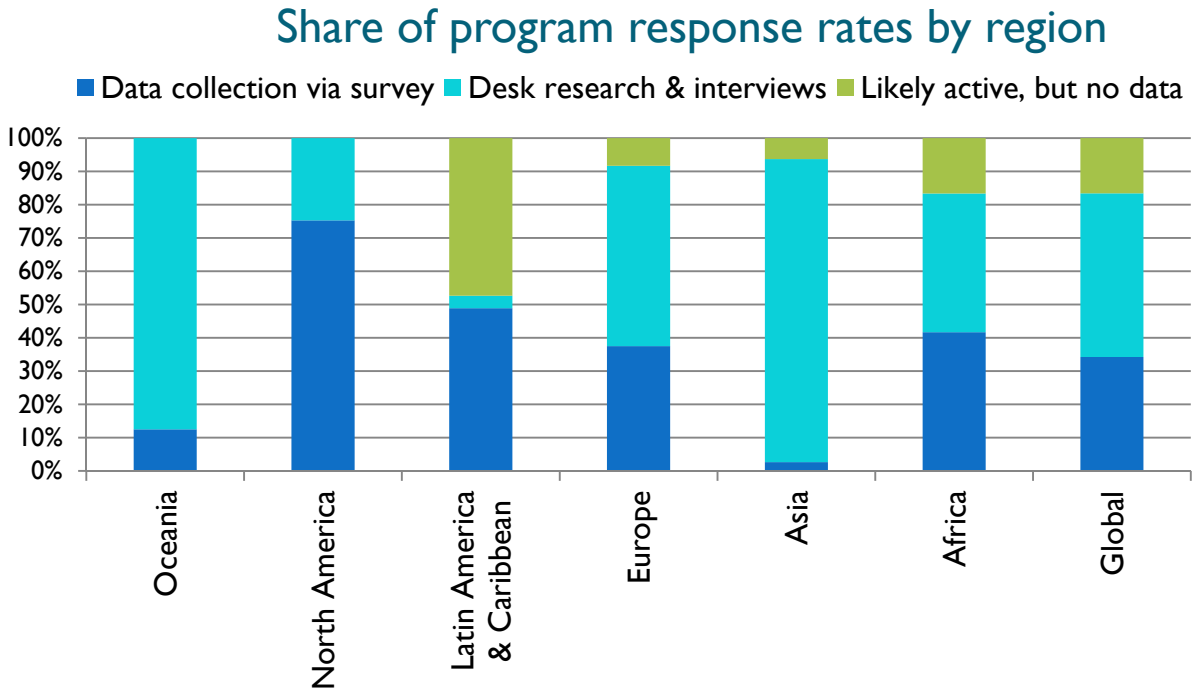
METHODOLOGY: Data based on global biannual online survey, interviews and desk research collecting data on activities in 2012-2013.



468 program profiles created
83% overall data collection rate

Thanks to our data collection partners:

CEPRC · Colorado State University · EcoDecisión investment in nature · ETIFOR

Source: Forest Trends' Ecosystem Marketplace. (2014). *State of Watershed Investment 2014.*

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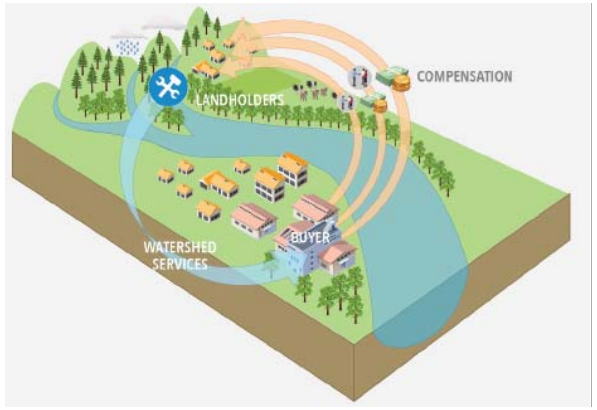
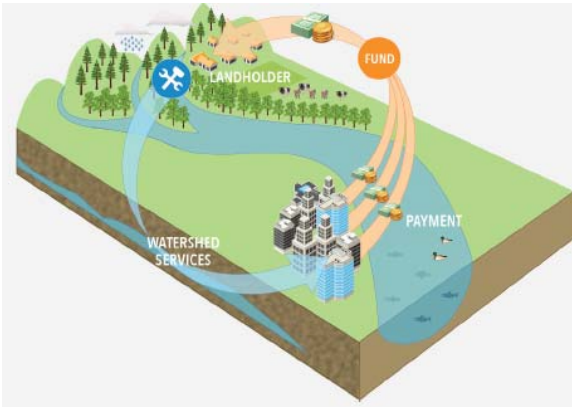
METHODOLOGY: Scope includes financial mechanisms linking a buyer and seller in which the exchange is intended to ensure the supplier's provision of watershed services (or some proxy indicator).

Watershed investment mechanisms tracked, 2012-2013

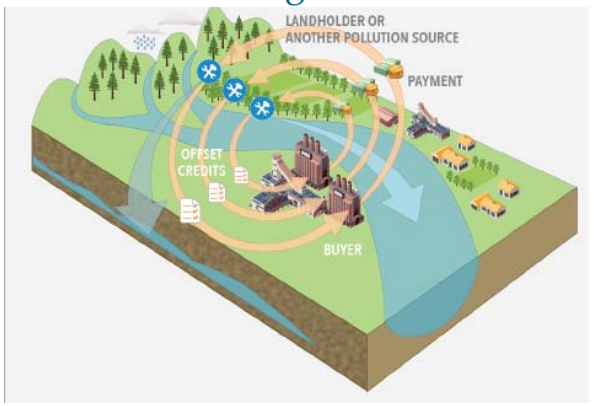


Bilateral agreements

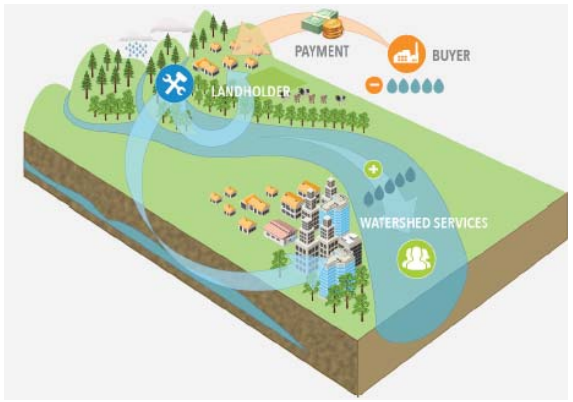
Public subsidies



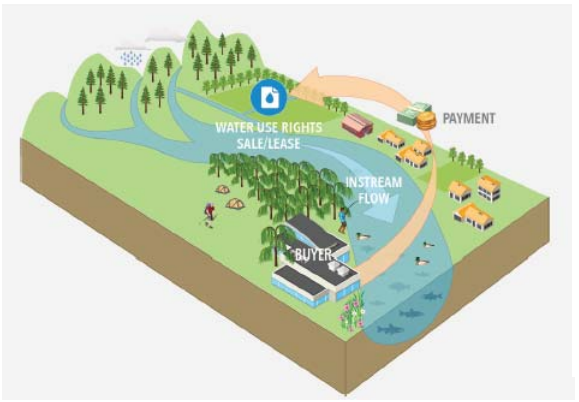
Collective action funds



Trading & offsets



Voluntary compensation



Instream buybacks

Source: Forest Trends' Ecosystem Marketplace. (2014). *State of Watershed Investment 2014.*

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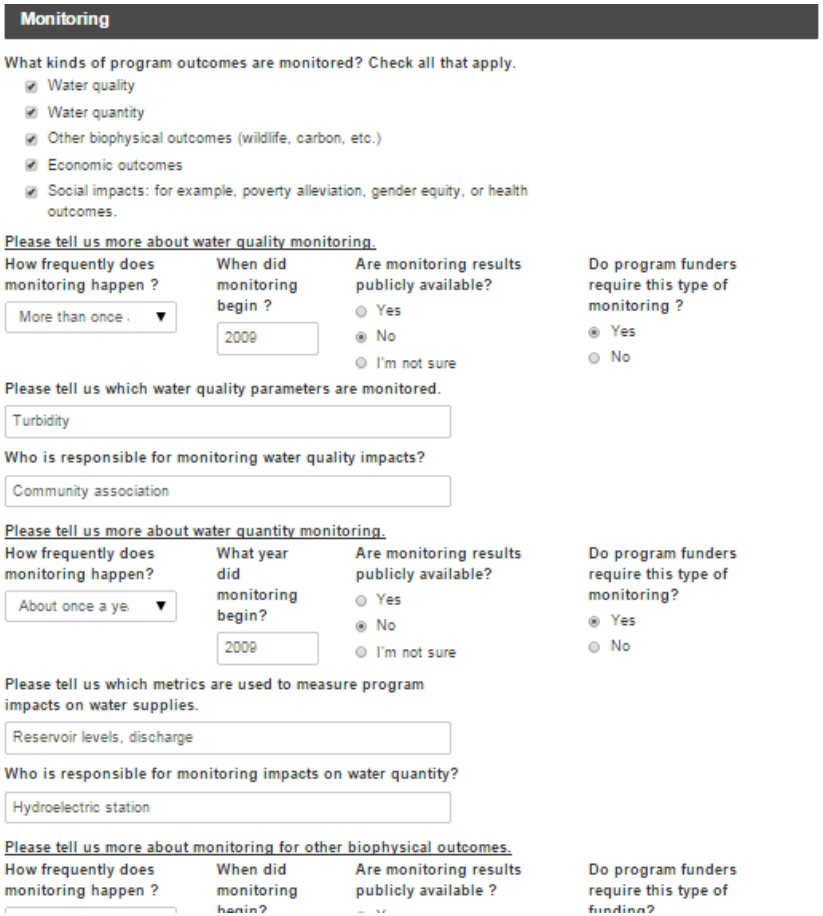
METHODOLOGY: The 2014 'State of' survey included a number of questions on program M&E and quantification of ecological performance.



Monitoring

What kinds of program outcomes are monitored? Check all that apply.

- [x] Water quality
- [x] Water quantity
- [x] Other biophysical outcomes (wildlife, carbon, etc.)
- [x] Economic outcomes
- [x] Social impacts: for example, poverty alleviation, gender equity, or health outcomes.

Please tell us more about water quality monitoring.

How frequently does monitoring happen ?	When did monitoring begin ?	Are monitoring results publicly available?	Do program funders require this type of monitoring ?
More than once a	2009	○ Yes ● No ○ I'm not sure	● Yes ○ No

Please tell us which water quality parameters are monitored.

Turbidity

Who is responsible for monitoring water quality impacts?

Community association

Please tell us more about water quantity monitoring.

How frequently does monitoring happen?	What year did monitoring begin?	Are monitoring results publicly available?	Do program funders require this type of monitoring?
About once a ye	2009	○ Yes ● No ○ I'm not sure	● Yes ○ No

Please tell us which metrics are used to measure program impacts on water supplies.

Reservoir levels, discharge

Who is responsible for monitoring impacts on water quantity?

Hydroelectric station

Please tell us more about monitoring for other biophysical outcomes.

How frequently does monitoring happen ?	When did monitoring begin?	Are monitoring results publicly available ?	Do program funders require this type of funding?

Source: Forest Trends' Ecosystem Marketplace. (2014). *State of Watershed Investment 2014.*

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QUANTIFICATION OF BENEFITS: Important to understand not just which performance metrics programs are using, but how those metrics inform decision-making.

How many programs are quantifying outcomes, and how are they doing it?

What are they doing with that data?

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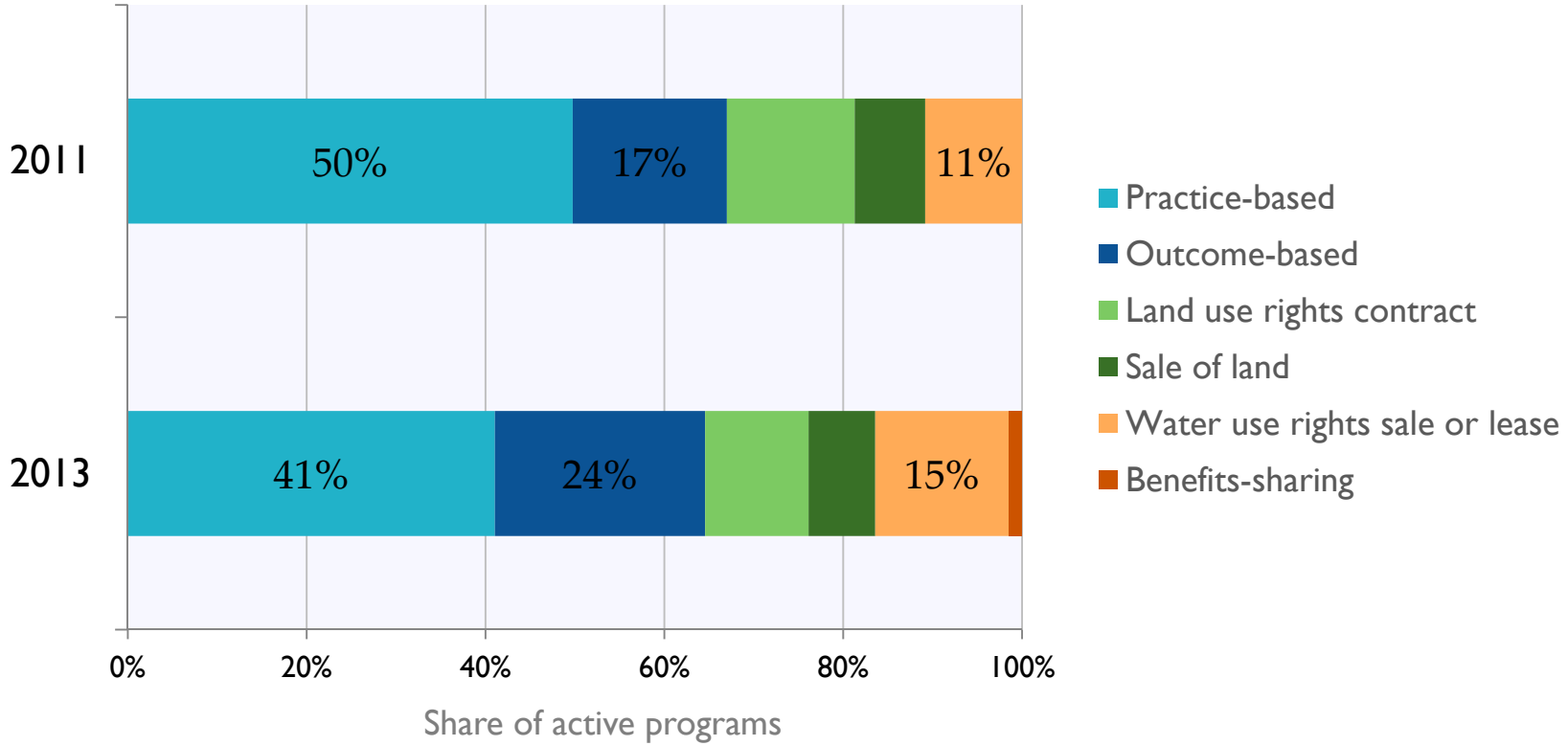
PERFORMANCE-BASED PAYMENTS: Our tracking finds a shift in recent years toward linking payments to specific outcomes.

Basis of payment for watershed investment programs, 2011 and 2013



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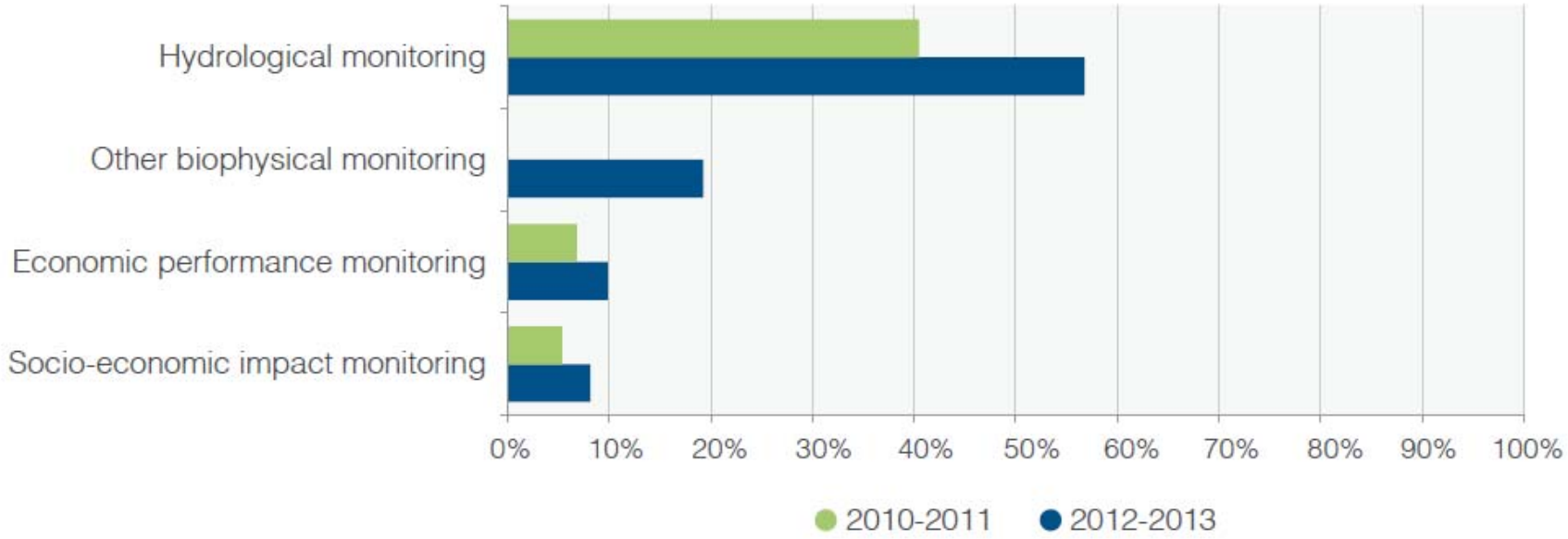
M&E: Broadly, reported monitoring and evaluation rates increasing though still quite low for some types of indicators.

Global monitoring rates by type, 2010-11 and 2012-13



**Data not collected on monitoring for 'Other biophysical indicators' in 2010-2011.*

Source: Forest Trends' Ecosystem Marketplace. (2014). *State of Watershed Investment 2014.*

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PERFORMANCE TRACKING: We find some common metrics across programs to track hydrologic performance.

Hydrologic metrics reported by programs, 2012-2013

NUMBER OF PROGRAMS		METRIC
	26	Pollutant load reduction (lbs, tons, kg, kCal/day)
	22	Volume of augmentation/recharge (megaliters, acre-feet, m3 of water)
	13	Flow augmentation (cfs, cms, gals/day)
	6	Pollutant concentration reduction (mg/L)
	1	Volume of retention (acre-inch/year, gallon/year)

Source: Forest Trends' Ecosystem Marketplace. (2014). *State of Watershed Investment 2014.*

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PERFORMANCE TRACKING: Programs reported a wide range of biophysical indicators used for program M&E.

Other biophysical metrics reported by programs, 2012-2013

mammal and bird abundance late successional vegetation present large tree vigor insect & disease conditions carbon sequestration small mammal populations soil cover forest volume plant abundance and composition mortality/success of seedlings diversity of species streambank erosion abundance of species count of bioindicator species hectares of forest cover benthic macroinvertebrates fish habitat quality afforestation area soil conservation capacity sand governance quality sand-fixing efficiency air quality

Source: Forest Trends' Ecosystem Marketplace. (2014). *State of Watershed Investment 2014.*

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PERFORMANCE TRACKING: Programs also report a range of socio-economic metrics, though social impact M&E remains low (8% of programs globally).

Metrics reported by programs monitoring socio-economic impacts, by region

	ASIA	AFRICA	EUROPE	LATIN AMERICA & CARIBBEAN	NORTH AMERICA
Additional income		●		●	●
Employment levels/jobs created	●	●		●	●
Time saved collecting water and firewood, by gender		●			
Gender equity		●			
Soil productivity		●			●
Crop yields		●			
Meals per day		●			
Ability to pay for health services		●			
Ability to pay for school contributions		●			
Number of households receiving solar cookers/wood-saving stoves				●	
Number of households receiving agro-inputs (seeds, tools)		●		●	
Number of households receiving payment	●	●	●	●	●
Social capital	●				
Local attitudes toward watershed protection					●

Source: Forest Trends' Ecosystem Marketplace. (2014). *State of Watershed Investment 2014.*

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PERFORMANCE METRICS: Co-benefits matter! Metrics choice can strongly influence program approval/evaluation.

Case study | The Sustainable Catchment Management Program (SCaMP)

CONTEXT:

- United Utilities, UK's largest water company, owns 56k ha surrounding its reservoirs. Around 30% of land is designated as a Site of Special Scientific Interest (SSSI), e.g. a nationally significant habitat for biodiversity conservation.
- SCaMP works with farm tenants to fund moorland restoration, fencing, woodlands, farm infrastructure, and protecting watercourses. Primary goal is to address water color and sedimentation.
- In England and Wales, water companies must submit catchment management proposals to water regulator Ofwat for approval during price review of business plans (every five years).

CBA:

Main benefits are for GhG mitigation and biodiversity conservation — United Utilities' capital and operational expense savings for water treatment are relatively small.

➲Regulators approved SCaMP on the basis of cost-benefit analysis demonstrating co-benefits (water quality, biodiversity, and carbon storage) delivered by watershed approaches.

Source: Forest Trends' Ecosystem Marketplace. (2014); United Utilities (2012); Higginson and Austin (2014).

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QUANTIFICATION OF BENEFITS: Important to understand not just which performance metrics programs are using, but how those metrics inform decision-making.

How many programs are quantifying outcomes, and how are they doing it?

What are they doing with that data?

- Paying for performance
- Attracting new buyers
- Tracking progress toward compliance or project goals
- Comparing with alternatives to the project
- Better allocating budget to maximize ecological ROI
- Justifying the project to regulators, ratepayers or taxpayers

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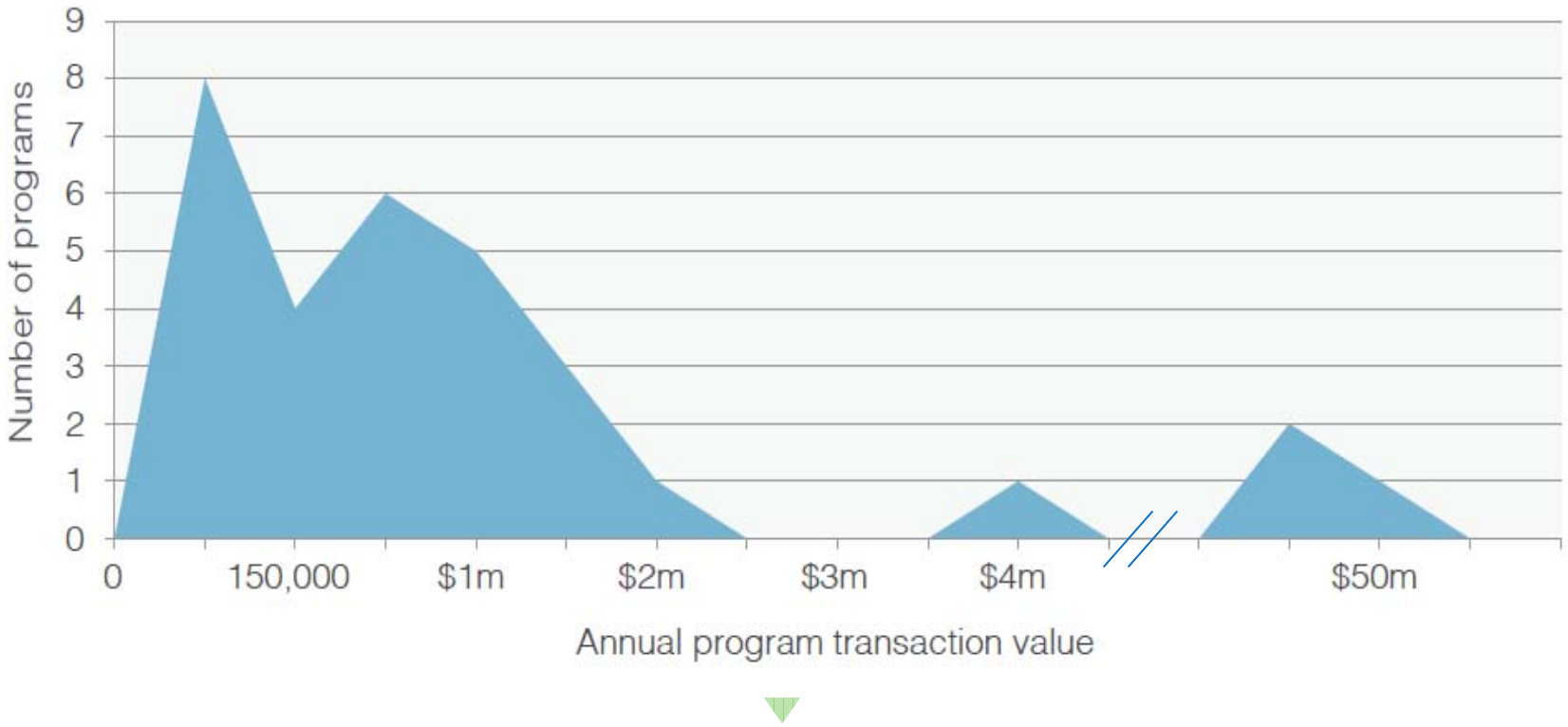
PERFORMANCE TRACKING: Methodologies used by programs run from simple quantification of outcomes to full valuation of net benefits.

Distribution of programs by annual transactions, Latin America & Caribbean, 2013



Source: Forest Trends' Ecosystem Marketplace. (2014). *State of Watershed Investment 2014.*

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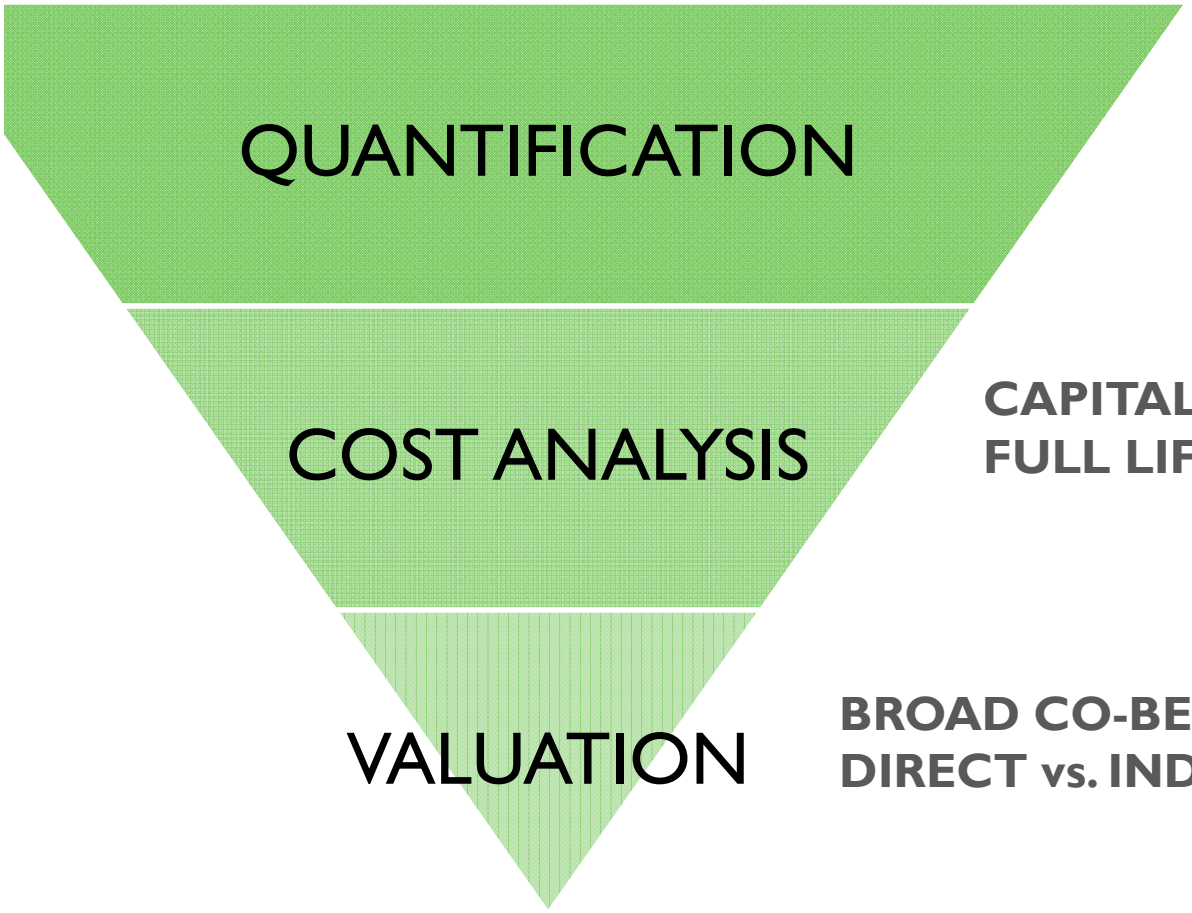

CAPITAL COSTS
FULL LIFE-CYCLE

BROAD CO-BENEFITS INCLUDED?
DIRECT vs. INDIRECT BENEFITS

Source: Forest Trends' Ecosystem Marketplace. (2014). *State of Watershed Investment 2014.*

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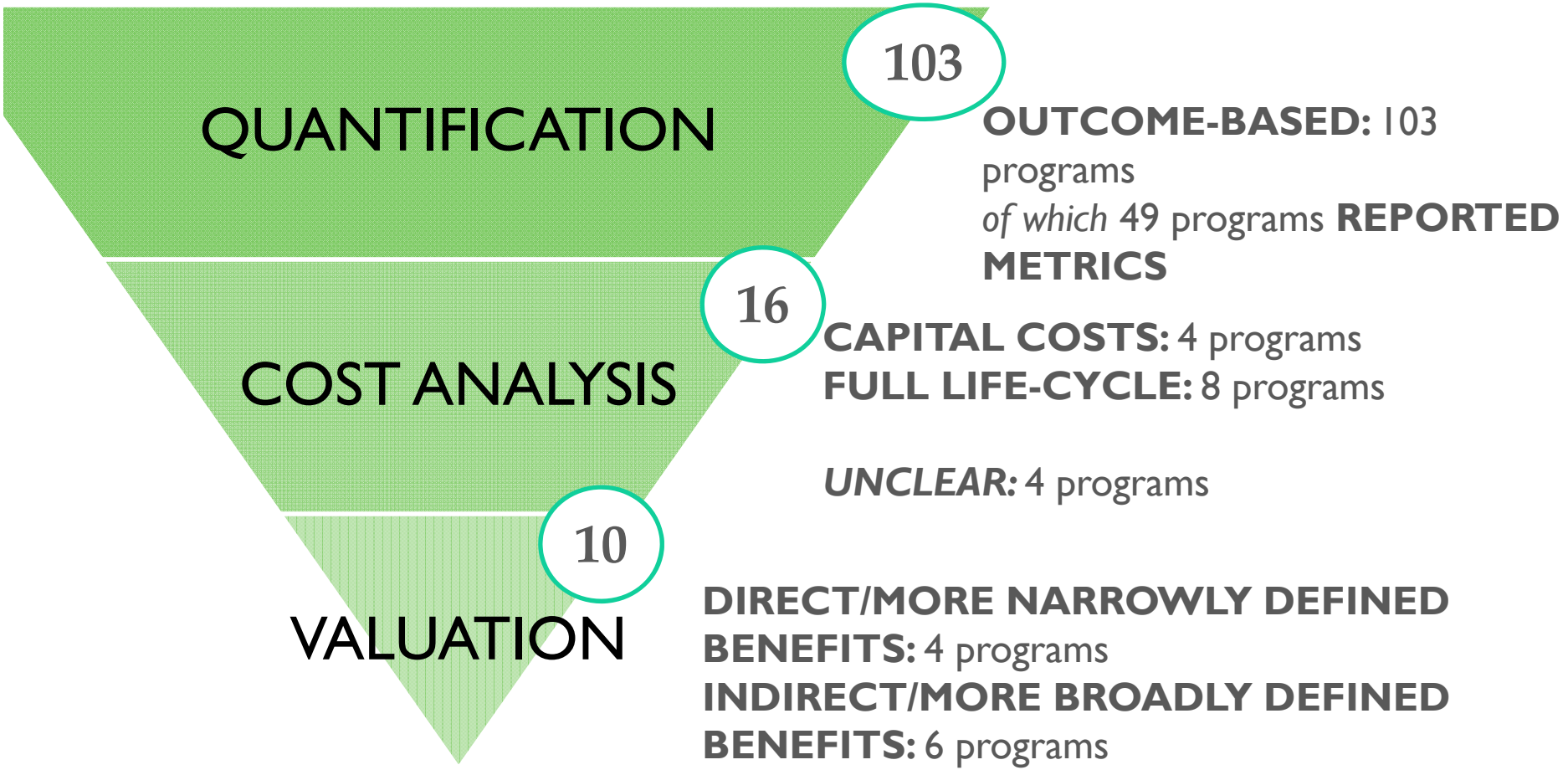
PERFORMANCE TRACKING: Methodologies used by programs run from simple quantification of outcomes to full valuation of net benefits.



Source: Forest Trends' Ecosystem Marketplace. (2014). *State of Watershed Investment 2014.*

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CONSIDERATIONS IN QUANTIFYING PERFORMANCE (1): Program developers face a number of considerations in deciding how and whether to track performance.

IS IT NECESSARY?

- Quantifying outcomes is expensive. Depending on the type of intervention and buyer demand, programs may find that simple measures like hectares under management are sufficient.

WHAT KIND OF INFORMATION IS REQUIRED?

- Metrics choice can be shaped by program capacity, available local data, usefulness of the metric to buyers, degree of flexibility of comparison across different interventions…
- Once metrics are chosen, do decision-makers require ongoing monitoring? Will they be satisfied with predictive modeling of outcomes or *ex post* evaluation?

WHAT KIND OF INFORMATION IS AVAILABLE?

- Local data and applicable models/methodologies can limit feasibility of approaches.

Source: Forest Trends' Ecosystem Marketplace. (2014). *State of Watershed Investment 2014.*

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CONSIDERATIONS IN QUANTIFYING PERFORMANCE (11): Program developers face a number of considerations in deciding how and whether to track performance.

SHOULD PERFORMANCE BE MONETIZED?

➲ Is it informative and useful to value outcomes in dollar terms, or are biophysical indicators more appropriate?

METHODOLOGICAL QUESTIONS:

➲ Programs need to work through questions like defining temporal and geographic scale of interest, interventions being considered, economic discounting, risk and uncertainty, etc.

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DECISION-MAKING: Methodologies and metrics can dramatically alter the conclusions. Quantification should *inform* decision-making, not substitute for it.

Case study | Kenya's Sasumua Reservoir

CONTEXT: Land degradation from upstream deforestation and agriculture is leading to increased sediment and nutrient loads to the reservoir. Pro-poor Rewards for Environmental Services in Africa (PRESA) is exploring a payment mechanism to upstream landholders.

INITIAL CBA:

BENEFITS: Sediment yields reduced by 20% and treatment cost savings of $23,256/year
COSTS: $20,349 the first year and $3290/year thereafter

➲ Based on these results, prospective buyer (Nairobi City Water and Sewerage Company) felt these savings didn't justify moving forward – sediment seen as a relatively small problem for them.

MORE DETAILED PROBABILISTIC MODEL:*

Benefits: NPV >$120,000/year

**Currently being verified*

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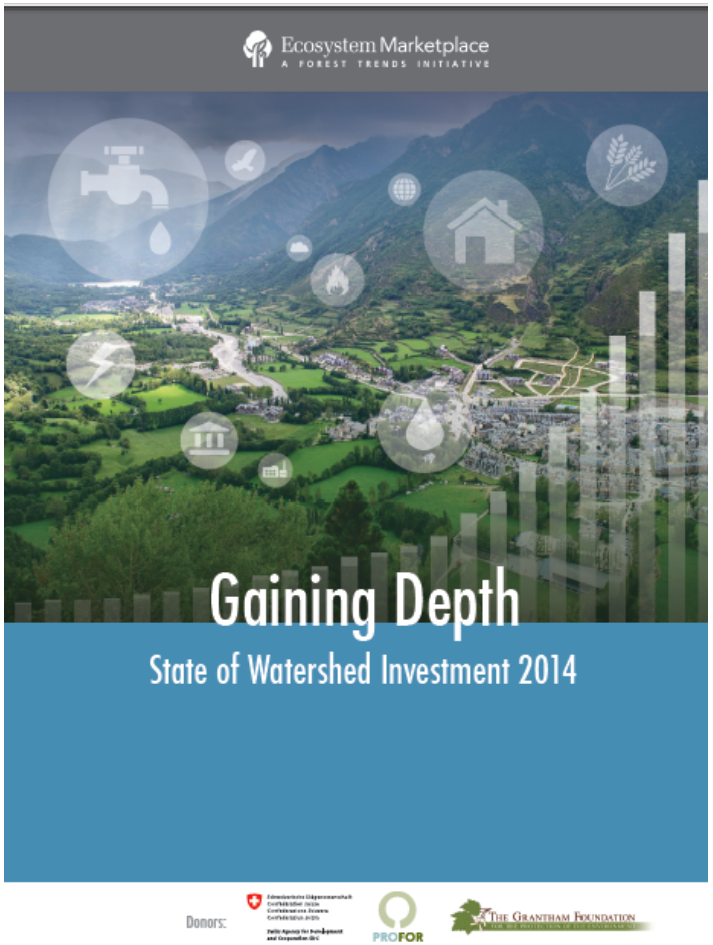

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FULL REPORT OUT NEXT WEEK

http://www.forest-trends.org/dir/sowi_2014/