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Development of Feasible Indicators for Restoration of Watershed Services

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Traditional Approaches to Watershed Management and Implementation

- Opportunity-based implementation
- Lack of defined goals/objectives/end points
- Selecting projects based on cost with little or no regard to outcomes
- Current status/conditions not defined
- Inadequate tracking/monitoring system
- **Inadequate Indicators for Assessing Watershed Opportunities**



Systematic Approach to Better Watershed Management

Critical Elements:

- Define the Setting & Needs
- Assess and Prioritize Options
- Strategic Implementation

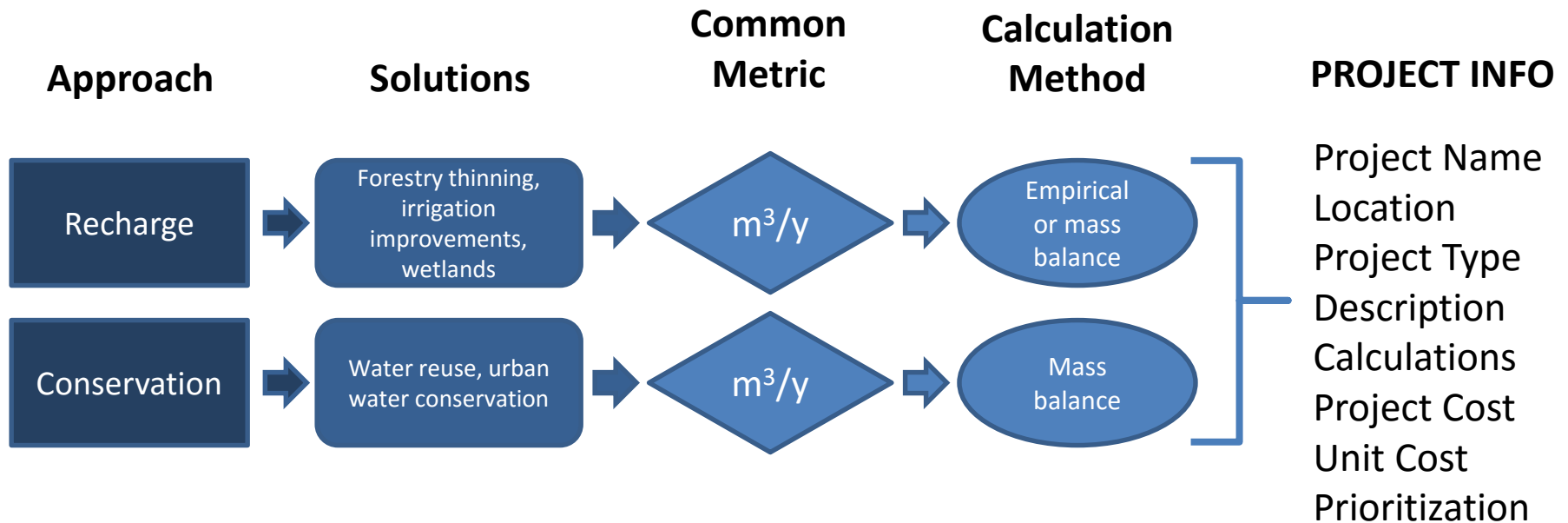
All of these efforts can be based on appropriate Watershed Indicators (or “metrics”)

Metric = “a standard for measuring or evaluating”



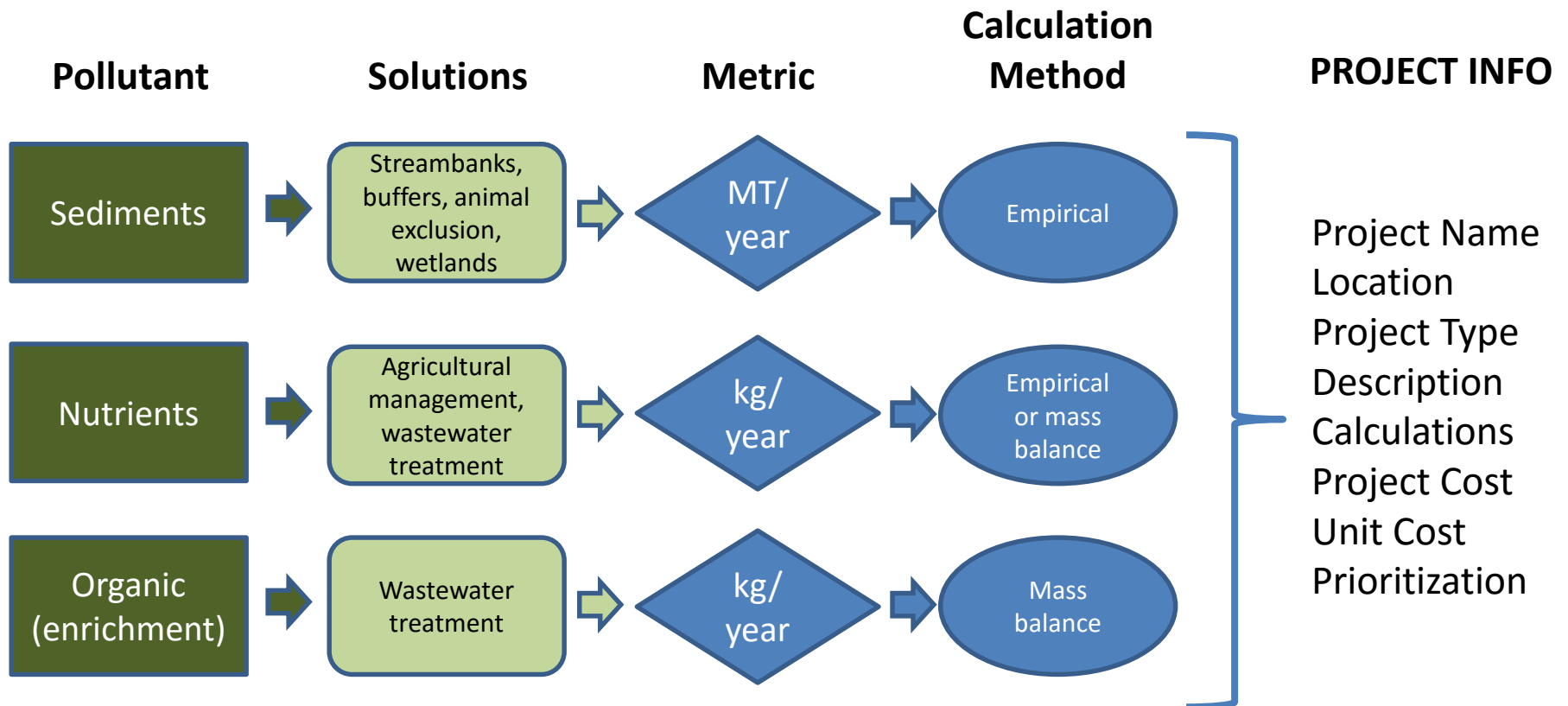
Quantifying Watershed Services

Water Quantity Projects



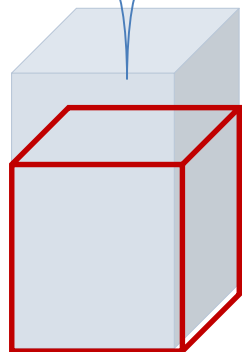
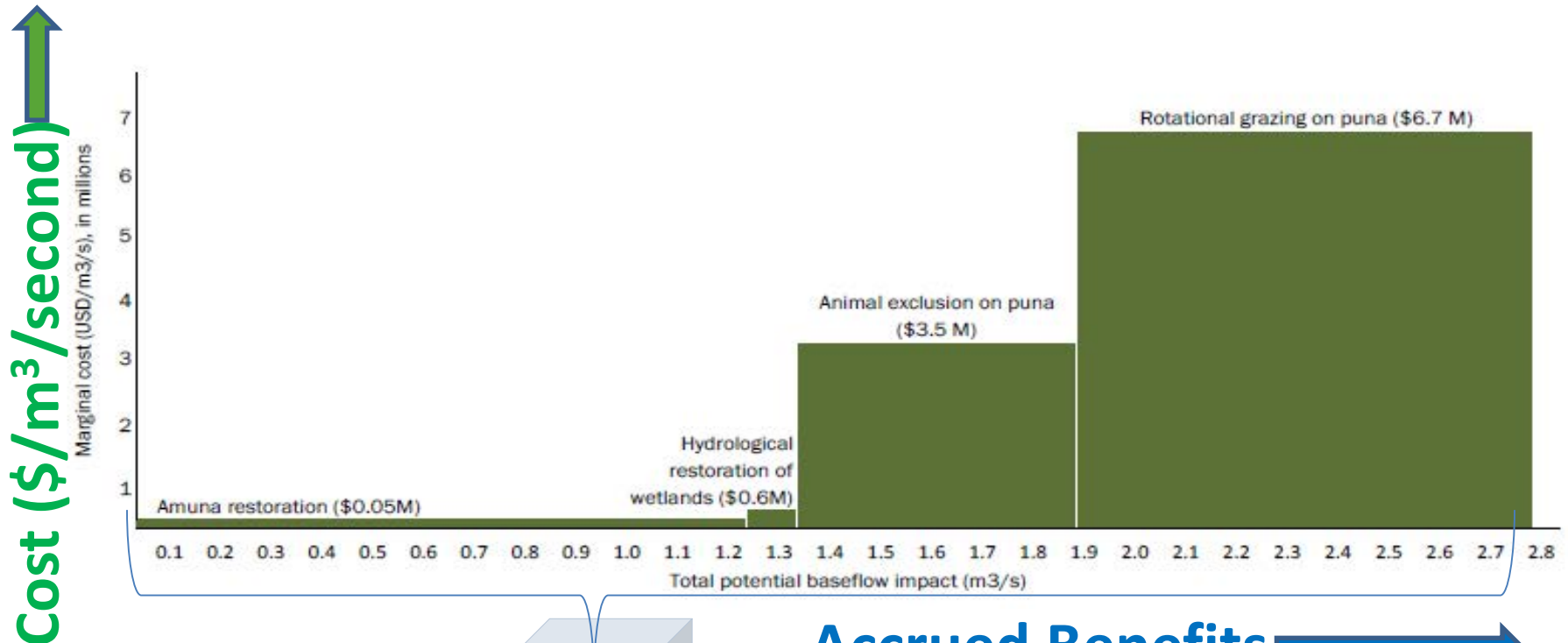
Quantifying Watershed Services

Water Quality Projects



Application of Metrics

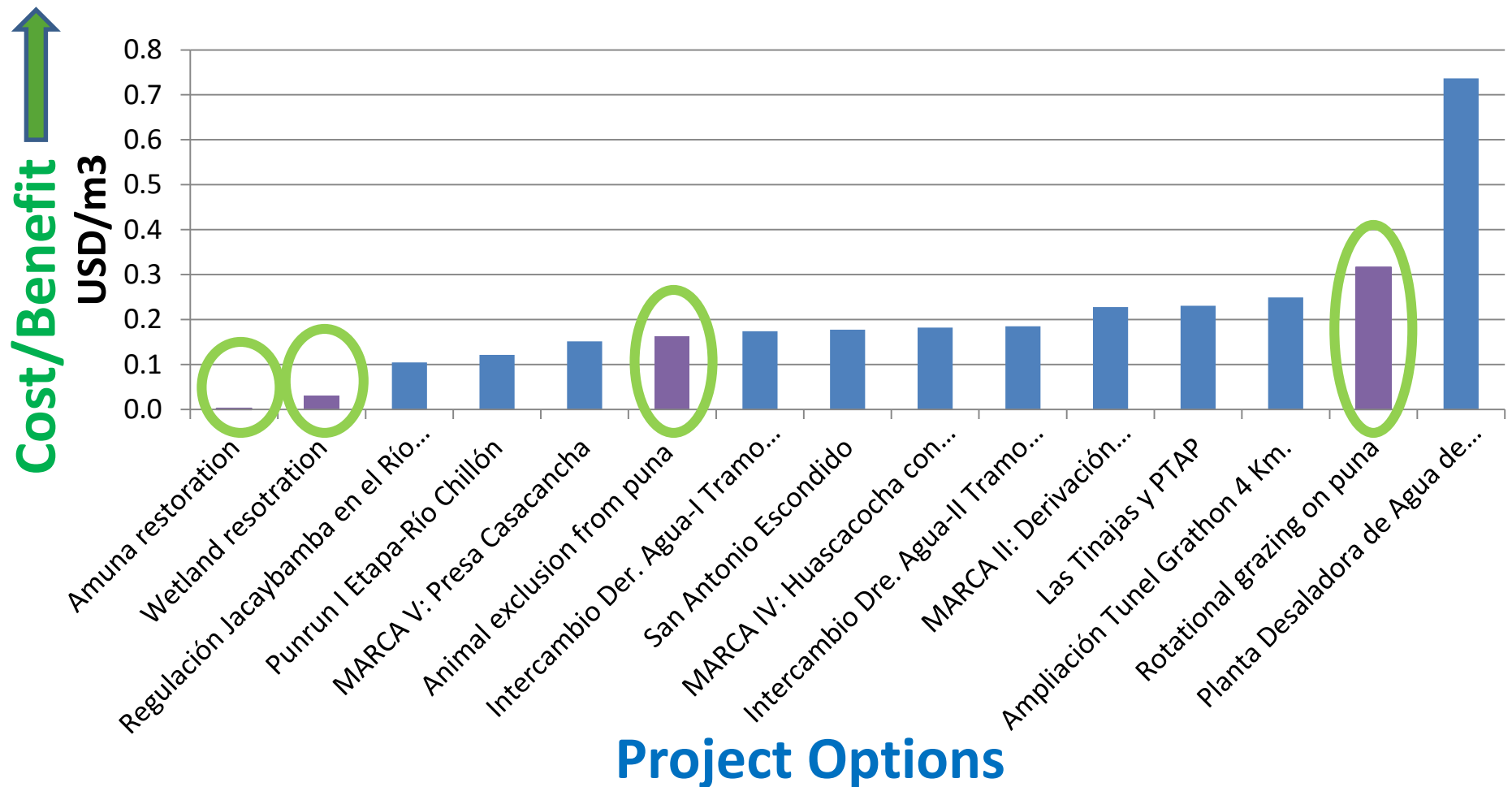
Green Infrastructure in Lima, Peru (*Aquafondo* Water Fund)



Accrued Benefits

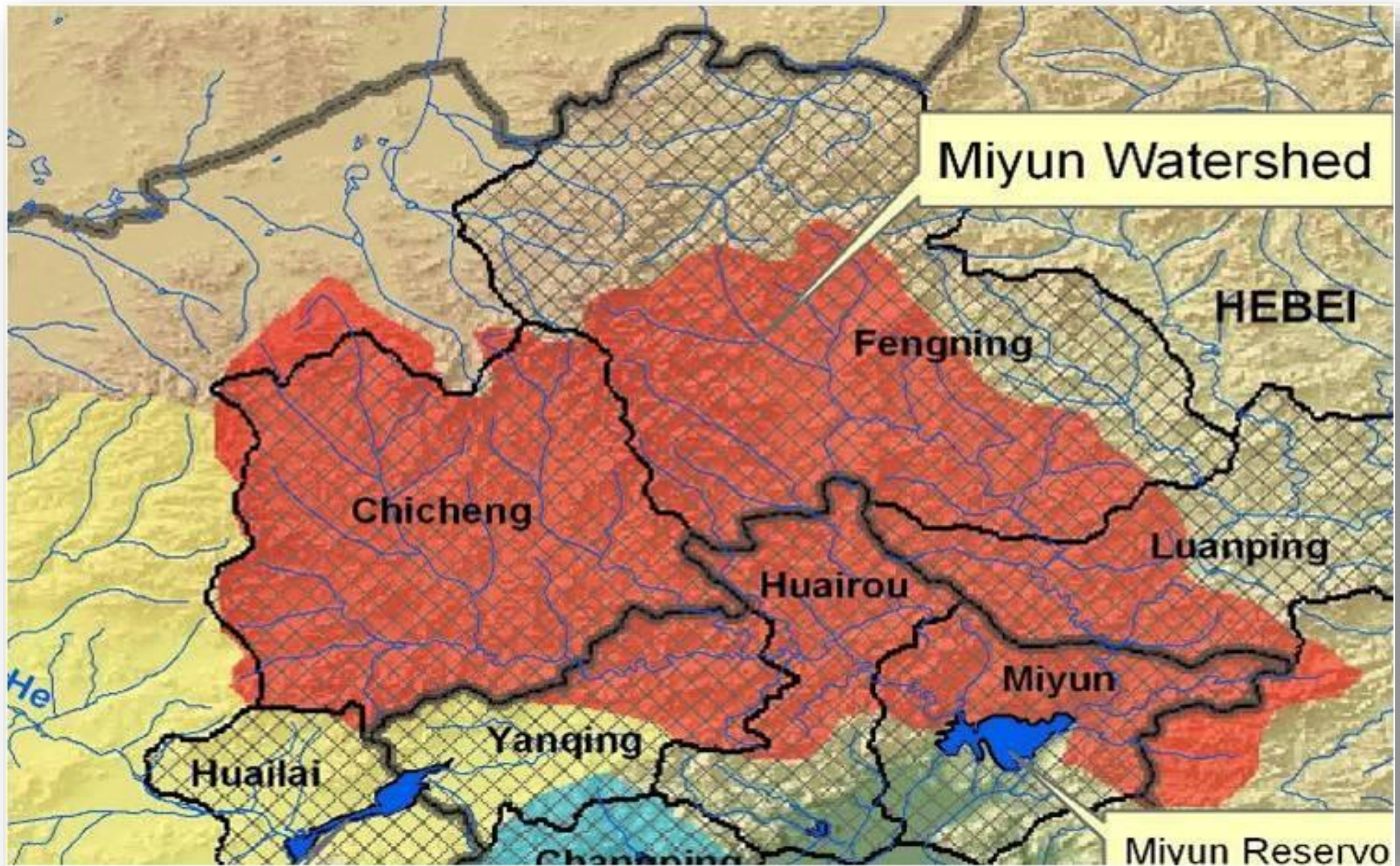
135% potential
reduction of
dry season
deficit

Informed Watershed Investments in Peru Using Flow Metric (m^3/second)



Sources: Forest Trends analysis
Gray infrastructure costs: Nippon Koei (2011)

Quantity & Quality Benefits Projected to Miyun Watershed Scale



Potential Watershed-scale Benefits:

Forest Thinning (*volume: m³/year*)

Total Area Potentially Managed: 4,650 - 8,850 km²
(Entire Miyun Watershed)

Total Potential Investment: ¥0.9 – 1.8B/year
(Over 5-year period)

Potential Water Quantity Benefit: 62 – 119B m³/year
(recognizing 5-year benefit)

**Could provide an additional 12-14% of the water
provided to Beijing by Miyun Reservoir annually**


Preliminary Watershed-scale Benefits:

Riparian Buffers (*quality = MT/year*)

Total Area Potentially Managed: 460 km²

Total Potential Investment: ¥15.6 million/year

**Potential Load Reduction Benefit: 86 MT Nitrogen/year
11 MT Phosphorus/year**



Could represent a load reduction of 3% and 44% of annual N and P loads to the reservoir, respectively

Importance of Watershed Indicators

- The correct indicators (metrics) match problems with relevant solutions
- The calculation of benefits using metrics...
 - Provides certainty for investments
 - Allows for prioritizing of projects
 - Identifies critical data gaps
 - Provides transparency and accountability
 - Provides opportunity to track progress
 - Allows for projection of benefits at scale



Thank you

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