State of Green Infrastructure
Investment in the Water Sector

Gena Gammie, Forest Trends Water Initiative
Katoomba Marketplace Latin America
Lima, Peru
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By 2030:

- **6.1**: universal access to **safe & affordable drinking water for all**
- **6.2**: adequate & equitable sanitation & hygiene for all
- **6.3**: reducing pollution, wise reuse-recycling
- **6.4**: increase water use efficiency, sustainable withdrawals, **reduce number people suffering water scarcity**
- **6.5**: implement IWRM at all levels
- **6.6**: protect & restore water-related ecosystems, mountains, forests, wetlands, rivers, aquifers....
Climate change makes water resources management even more important

Oferta y demanda de agua para la cuenca del Río Rimac.
By maintaining and enhancing ecosystem services, green infrastructure helps to optimize water resources management.
Green Infrastructure for Water

Natural or nature-based systems that perform the same functions as built or gray infrastructure:
regulating supply, storage, filtration & treatment. Can be an alternative or complement to gray infrastructure.

Protected Ecosystem / Managed Ecosystem

Forests, Wetlands, Grasslands, Rivers, Lakes

Restored / Managed Ecosystem

Reforestation; River, Floodplain, Wetland Restoration; Sustainable Forestry or Agroforestry; Ecological Agriculture; Silvopastoral Systems; Sustainable Aquaculture

Created System / Green Engineering

Constructed Wetlands (water treatment); Green Roofs, Green Streets; Bio-engineered Shoreline Protection

Built or Gray Infrastructure

Water Treatment Plants, Storage Reservoirs, Desalination Plants, Wastewater Treatment Plants, Urban Drainage Systems, Flood Barriers
The benefits of green infrastructure


### Table 2: Overview of CI solutions relevant for water resources management

Solutions marked with ‘*’ consist of built (‘grey’) elements that interact with natural features and seek to enhance their water-related ecosystem services.

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<td>Water purification</td>
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<td>Moderation of extreme events (floods)</td>
<td>Green roofs</td>
<td>Urban</td>
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<td>Coastal flood (storm) control</td>
<td>Protecting/restoring mangroves, coastal marshes and dunes</td>
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<td>Sea walls</td>
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<td>Protecting/restoring reefs (coral/oyster)</td>
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Green Infrastructure Benefits

Water Sector:
• Avoided capital costs
• Reduced operating costs (e.g., raw water quality)
• ‘No regrets’ strategies
• More resilient water systems (e.g., reduced flood risks to WTPs)
• More reliable, sustainable supplies (dry season flows, groundwater recharge)

Other Sectors:
✓ Reduced flood damages (roads, bridges, energy facilities)
✓ Cleaner air (healthier air)
✓ GHG reductions, climate adaptation
✓ Cleaner water (health water borne diseases)
✓ Improved agricultural productivity
✓ Rural livelihoods
✓ Economic opportunities (eco-tourism, certified agricultural products)
Our ability to quantify the benefits of green infrastructure is improving significantly.

Figure: Cost-effectiveness of green and gray strategies for closing the water supply gap for Lima, Peru

Potential Scale: Cost Savings

Estimated avoided costs (WTP O&M) of healthy watersheds for urban utilities **About $108 billion***

2% of current gray infrastructure spending: **About $135B – 270B in avoided costs**

Current spending on green infrastructure for water: **About $24B**

*McDonald et al. 2016; ** McDonald and Schemie 2014, White et al. 2010*
Number People Benefitting: Water Quality Improvements

- Forest Fuel Reduction: **100 million**
- Reforestation: **110 million**
- Riparian Restoration: **140 million**
- Forest Protection: **475 million**
- Agricultural BMPs: **600 million**

Green infrastructure interventions in 100 largest cities – 10% sediment reduction (McDonald and Schemie 2014)
El subsidio público ha dominado el valor invertido, pero los otros modelos representan más de 75% del número de programas.

Figura 4: Comparación entre Tipos de Programas por Valor y Prevalencia, 2013
(Valor: $ Transados en 2013, y Prevalencia: # de Programas Activos/Piloto)

*Nota: 'Compensaciones Voluntarias' se refiere a pagos hechos por compañías para actividades que compensen simbólicamente sus impactos - como el volumen de agua usado.

Los usuarios del agua están entrando cada vez más al entender sus riesgos hidricos.
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Tendencias en los mecanismos financieros para los servicios ecosistémicos

- Liderazgo y participación de beneficiarios locales; mayor participación de empresas (públicas y privadas)
- Más énfasis en el desempeño hidrológico en el diseño, priorización y evaluación de proyectos/inversiones
- Inversiones más conectados con procesos participativos de planificación de cuencas

Modelo subsidiario

Modelo basado en desempeño
Insumos necesarios y desafíos para el nuevo modelo basado en desempeño y impulso local

Figura 10: Top Cinco Desafíos Reportados por Desarrolladores de los Programas

1. Falta de compradores: Calificación: 125
2. Gestión de fondos: Calificación: 103
3. Aumento de capital inicial: Calificación: 95
4. Barreras legales/regulatorias a los fondos de protección de cuencas: Calificación: 94
5. Falta de apoyo de los responsables políticos: Calificación: 79

Nota: Los datos sobre los desafíos de los programas fueron calculados en base al número de programas que reportaron el desafío, multiplicado por el ranking (1-5) asignado por los encuestados. Para este grupo de encuestados, teóricamente el mayor puntaje posible fue 415.

Upfront financing needed for green infrastructure projects – matching supply to demand

- Information for Strategic Design & Adaptive Management
  - Science / local knowledge for planning interventions
  - Linking interventions to outcomes
  - Evaluating social-environmental impacts

- Green Infrastructure Planning & Design
  - Stakeholder Engagement
  - Landscape Level Planning
  - Technical Design of Interventions
  - Socio-economic Impact Analyses

- Materials / Resources to Build Projects
  - Seeds, saplings, nurseries
  - Earth moving equipment
  - Monitoring equipment
  - Labor

- Capacity to Build Pipelines of Investable Projects
  - Human Capacity: design, implementation
  - Institutional Capacity: water sector, finance, government
  - Financial Capacity (creating financial architecture or ecosystem)
Barriers to Attracting Financial Investments

Lack of ‘investable’ projects:
- Small scale, diversity of project types, many individual ‘projects’
- Range of complexity
- Poor understanding of risk/return
  - Uncertainties around performance
  - Time lags to performance
- Uncertain / volatile future revenues
- **Utilities do not own green assets**
- Time to pay-back/ROI
Key Questions for Green Infrastructure Investments – Water Sector

• Moving from small, one-off projects to project pipelines (‘green infrastructure factories’) at scale
• Diversifying and de-risking revenue streams from green infrastructure
• Financial institutions or consortia that specialize in green infrastructure finance (GI Financing Facilities)
• Developing the human and institutional capacity in the water sector to scale green infrastructure
¡GRACIAS!

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Can ‘green’ investments address the water infrastructure funding gap?

**Current built or ‘gray’ infrastructure spending**
- About $500 billion (OECD)

**Additional investment needed in water & sanitation to meet SDG6 by 2030:**
- >$1.7 trillion (World Bank)

**Natural or ‘green’ infrastructure for water in 2015:**
- About $20+ billion; 11+% growth rate past 10 years (Forest Trends)