

Water and Economics

Dimple Roy

Director, Water Program, IISD

UN-DESA workshop on Capacity building in Water and SD

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Presentation

- IISD- Structure and roles
- IWRM
- Ecosystem services and economics
- Watershed-based bioeconomy approach
- Addressing subsidies, investment and other financial mechanisms
- Thinking strategically about resourcing and water management

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IISD'S PROGRAMS			SERVICES	
	Energy	Water	Resilience	Reporting Services
Economic Law & Policy				
<ul style="list-style-type: none"> • Investment • Sustainability Standards • Public Procurement & Infrastructure • Finance Sector Reform • Green Industrial Policy 	<ul style="list-style-type: none"> • Subsidies • Climate Mitigation • Electricity 	<ul style="list-style-type: none"> • Bridging science and water policy • Watersheds & Bioeconomy • Water-Energy-Food 	<ul style="list-style-type: none"> • Climate Adaptation • Fragile States • Food Systems 	<ul style="list-style-type: none"> • Earth Negotiations Bulletin • Knowledge Management
Knowledge for Integrated Decisions				
<ul style="list-style-type: none"> • Indicators & Measurement • Foresight & Scenarios • Adaptive Planning • Alternative Progress Measurement 				



Context

Global Water Security: Includes water quality, quantity and access for all...

Water shortages

Water technology

Ecosystem Services

Drinking water

Water and livelihoods

Water- Energy-Food Nexus

Water infrastructure

Water Pollution and Health

Climate Change

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Global Water Security

Global physical and economic water scarcity

WATER STRESS BY COUNTRY

ratio of withdrawals to supply

- Low stress (< 10%)
- Low to medium stress (10-20%)
- Medium to high stress (20-40%)
- High stress (40-80%)
- Extremely high stress (> 80%)

This map shows the average exposure of water users in each country to water stress, the ratio of total withdrawals to total renewable supply in a given area. A higher percentage means more water users are competing for limited supplies. Source: WRI Aqueduct, Gassert et al. 2013

 AQUEDUCT

 WORLD RESOURCES INSTITUTE

Source: World Resources Institute <http://www.wri.org/blog/2013/12/world%E2%80%99s-36-most-water-stressed-countries>

Integrated Water Resource Management

“Integrated Water Resource Management integrates land use and water management at a watershed level to optimize economic, social and environmental outcomes simultaneously”

IWRM Briefing Note, Jun 2004, Policy Research Initiative, Govt. of Canada

Key IWRM principles:

- Watershed as unit of water resource management
- Integration of land use, water use and stakeholder perspectives
- **Economic Valuation of water to be integral part of management**

IWRM Briefing Note, Jun 2004, Policy Research Initiative, Govt. of Canada

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Ecosystem Goods and Services

- Ecosystem Services are, simply, the benefits that people receive from ecosystems*
- Payments for Ecosystem Services involve valuing and paying for services that are not supported by conventional markets nor protected by law.
- The Millennium Ecosystem Assessment suggest four types of Ecosystems Services: Provisioning services, Regulating services, Cultural services and Supporting services.

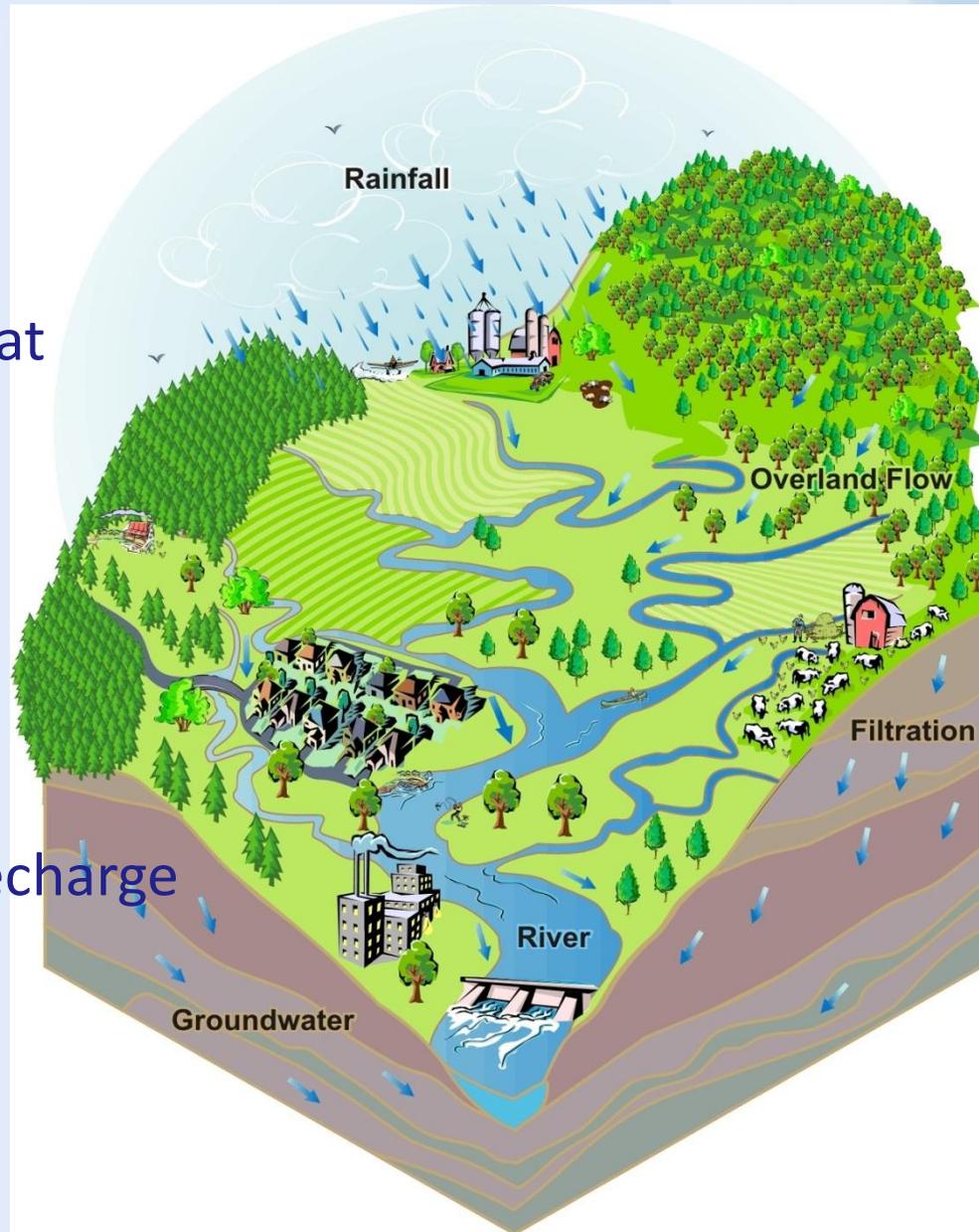
* Millennium Ecosystem Assessment, 2003; Kumar, 2005

Watershed Ecosystem Goods and Services

Aquatic and
terrestrial habitat

Agricultural
production

Groundwater recharge



Recreation

Water Storage

Flood and
drought
mitigation

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IWRM and Ecosystem Services

- Understand and communicate true value of watersheds
- Identify and develop mechanisms (policies, markets, etc.)

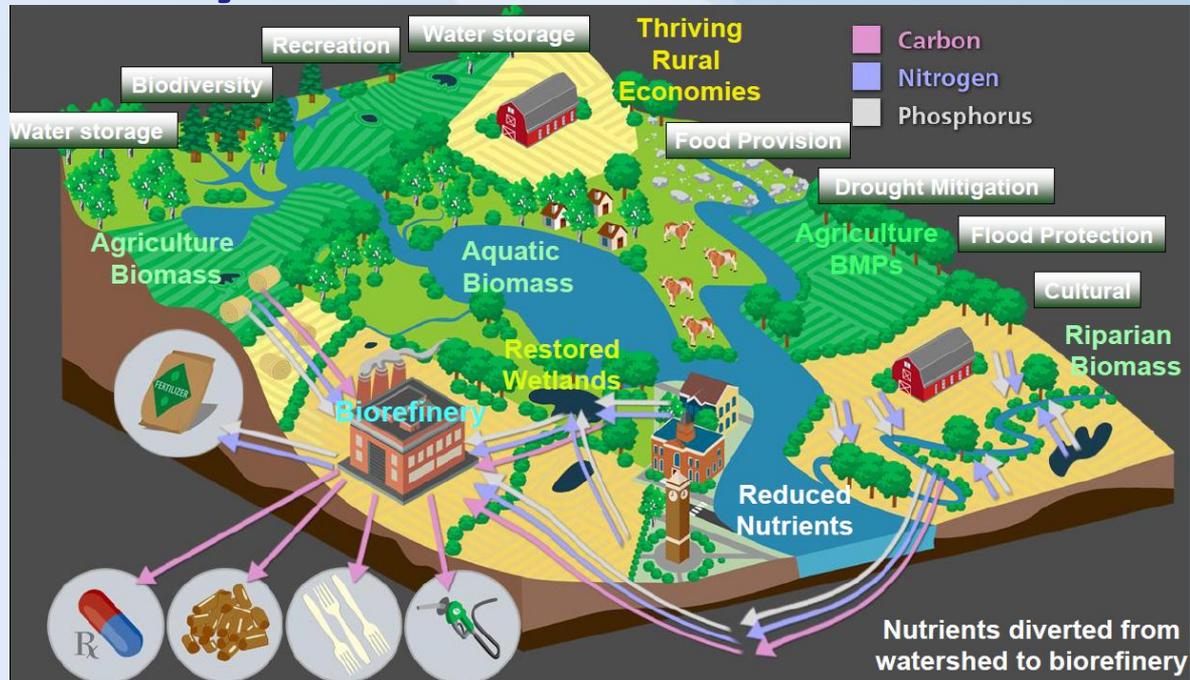


Large Scale PES: New York City Water Supply

- **Watershed Size:** 5,180 sq. km.
- **Population:** Drinking water for nine million people
- **Major Watershed Issues:** Drinking water quality
- **Annual Budget:** \$250 M



Green Economy: A watershed based bioeconomy in Canada



- Integrated approach
- Many benefits such as jobs in renewable sector
- Multiple financing mechanisms
- Integrating nutrient management, economic development, water management, carbon offsets, habitat management

Policy and Market Instruments

Policy Instruments:

- Market-based Instruments
- Direct Expenditure Instruments
- Regulatory Instruments
- Institutional Instruments



Market-based Instruments:

- Payments for ecosystem services
- Water quantity and quality trading
- Load-based licensing
- Wetlands banking, biobanking etc.
- Full-cost pricing for water services
- Complementary social and regulatory instruments

Ecosystem services valuation

Valuation technique	Description
Market Price Technique	Looks at what it costs to buy or sell based on supply and demand, scarcity and marginal value.
Effect on Production technique	Attempts to relate to the changes in output of particular services and related production
Surrogate market approach	Include travel costs and hedonic pricing- relating to people's expenditures or prices of other market goods and services
Cost-based approach	Include replacement costs, preventative expenses or avoided damage costs, look at market trade-offs or avoided costs.
Stated preference approach	Ask consumers to state their preferences directly. Use contingent valuation, and often a combination of analyses and choice experiments.

Summarised from Emerton and Bos, 2004

Irrigation Subsidies Reform: A thorny low-hanging fruit

Nature of work: Water pricing evaluation; methodology development; inventory of government support measures; analysis of impacts and political economy of irrigation subsidy reform; stakeholder forums; communications



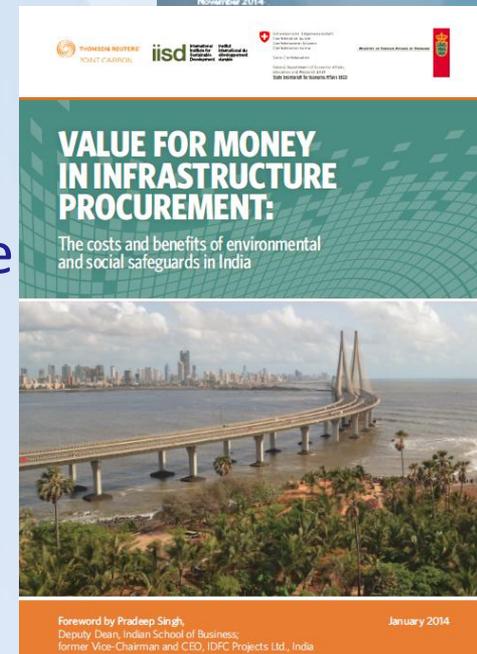
Outputs/Outcomes: Quantified irrigation subsidies; Recommendations for future targeting of government subsidies

Large-scale agricultural investments and water

Nature of work: Agricultural and mining investment negotiation training; advice on safeguarding or enhancing water systems for sustained agriculture, human and environmental needs.

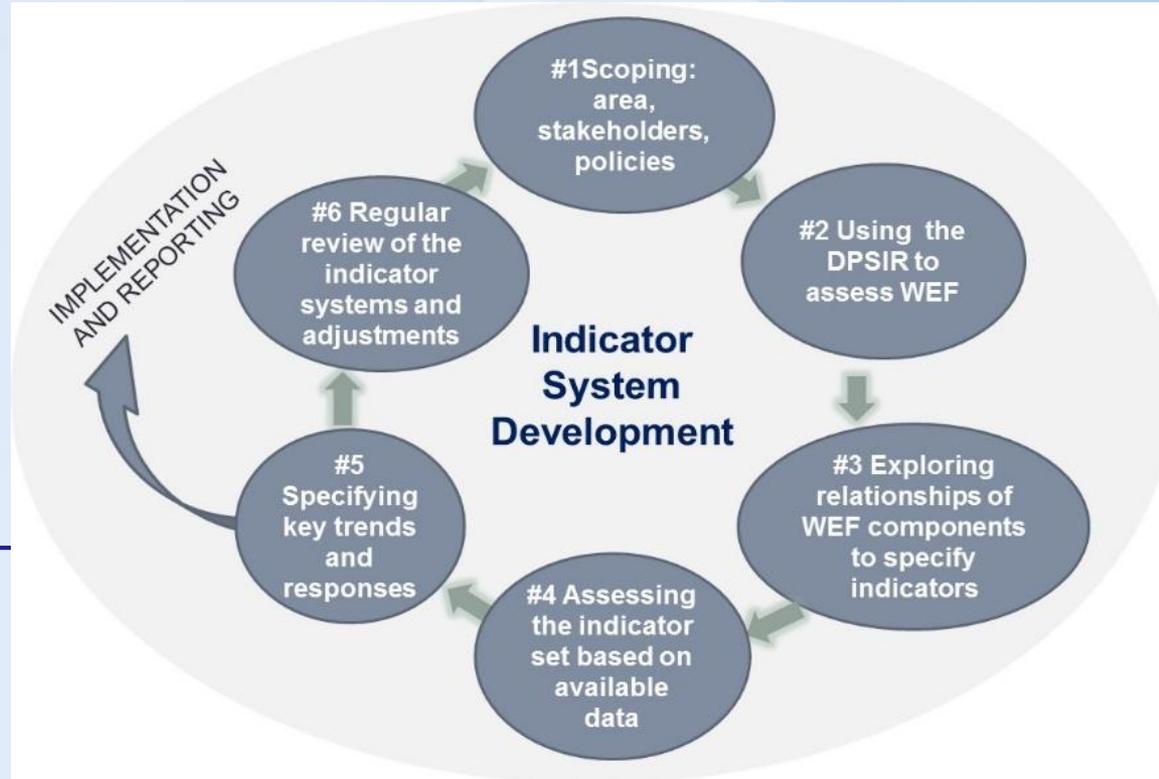
Public-private partnerships (PPPs) for water infrastructure and SD

Outputs/Outcomes: Decision-support and trade off analyses, water use permits and fees, targeting investments for sustainable land and water management.



Water-Energy-Food Nexus

- W-E-F Nexus highlighted as a global risk cluster by the World Economic forum.
- An opportunity to integrate very complementary areas of work in effective and cost-efficient ways.
- Indicators are a means of understanding the relationships and monitoring outcomes and processes.



National development planning, Economic Instruments and Water Management

- **Know your water issues:** Water security for any country/region includes water quality, quantity and access
- **Know the main stresses and futures:** Climate change, population, migration, water quality, floods, droughts, etc.
- **Know the main trade-offs in water management:** navigation, hydropower, mining, health, etc.
- **What are the water-related risks:** Based on stresses and main users of water, for e.g. agricultural productivity, energy pricing.
- **Know the main sources of financing water management:** Markets (water, commodities, energy), Economic policy instruments- subsidies, taxes, etc.
- **Match economic instruments with priorities:** Use available analyses to match current and potential financial mechanisms and priorities.

Water and Economics examples

- **Kenya's Water Strategic plan (2012-2017)** looking at integration with social pillar of national development plan. Financial mechanisms include revenue from water use and permitting, different partnership models, procurement, etc.
- **Water account, Australia 2012-2013:** Provides an overview of water supply in the Australian economy- water providers, water users, and a categorization of these.
- **Malaysia's** economic monitor: Includes mention of natural capital accounting and how land and water accounts can help increase hydro capacity, agriculture, etc. specifically, coastal wetlands and their role in flood management, fisheries etc.
- More...

Analyses, Training, and Capacity building

- **IWRM and EGS- ecosystem management**
- **Investment negotiation training**
- **Ecosystem monitoring and indicators**
- **PPPs and getting the best of your partnerships for SD**
- **Adaptive policy making**
- **Climate change and water- adaptation at various levels.**

Summary

- Water management is a complex, integrative issue and must be dealt with in the context of land, people, climate and other issues.
- IWRM provides a integrative framework for SD and water management
- Incorporating economic valuation into water-related decision-making is fundamental in resolving some of the resourcing and capacity issues that have challenged IWRM for decades
- Economic policies (taxes, subsidies, PES, etc.) must be augmented by market mechanisms (PES, offsets, quality and quantity trading, etc.)



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