Economical and societal value of water and its management

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A water-secure world

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- What is water valuation?
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IWMI's mission

To provide evidence-based solutions to sustainably manage water and land resources for food security, people's livelihoods and the environment

IWMI's vision

A water-secure world





A water-secure world

Where we work:

:: LOCATIONS OF IWMI OFFICES





A water-secure world



- A think tank driving innovative research and generating ideas for solutions.
- A provider of science based products and tools.
- A facilitator of learning, strengthening capacity and achieving uptake of research findings.



Consultative Group on International Agricultural Research (CGIAR)

A world free of poverty, hunger and environmental degradation





A water-secure world

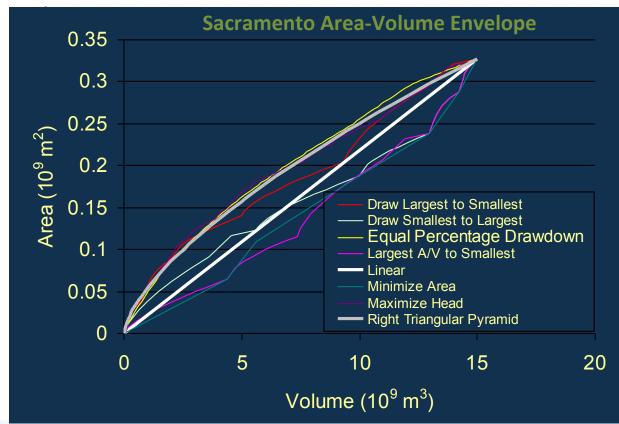
What is Water Valuation?

 "Water valuation is about assessing the worth of water to different stakeholders under a set of specific circumstances" (WBCSD, 2012).



Why Water Valuation?

- Why do we model?
- Why do we need to include water management?
 - Hint: Only 12% of the world's large rivers flow freely from source to sea (WWF)





Why Water Valuation?

- Water management is for meeting demands
- Water valuation defines those demands and associated priorities
- Water valuation leads to sustainability efficiency
- Regulations and conventions
 - Water Framework Directive (full cost recovery)
 - Blueprint to Safeguard Europe's Water, 2012
 - Dublin Statement, 1992
 - Convention on Biological Diversity, 1992
 - Banking sector's Natural Capital Declaration, 2012



Why Not Water Valuation

- Water has only fairly recently become a scarce economic good (at large scales).
- Complex and difficult
- Scope too large and varied
- Context Specific: No fit-for-all approaches
- Complex terminology
- Different stakeholder perspectives/priorities
- Ethical issues



Frameworks Figure 8

Water-related ecosystem services and links with total economic value and well-being

	Total economic value		Water-related ecosystem services		Water-related constituents of human well-being		
	Direct-use values		 Provisioning Freshwater (e.g., for drinking, agriculture & industry) Food (e.g., flsh) Fiber (e.g., reeds) Medical & genetic Energy production 	Cultural • Bankside recreation • Angling • Boating • Property (e.g., amenity) • Transport • Research • Education		 Security Personal safety Secure resource access Security from disasters 	Freedom of choice and action Opportunity to be able to achieve what an Individual values being and doing
						Basic material for good life	
		ues				 Adequate Ilvelhoods Sufficient food Shelter Access to goods 	
	Indirect- use values	Option values	 Regulating Climate regulation Flood regulation Disease prevention Water purification Erosion control 	 Habitat support Breeding & nursery grounds Biological corridors 		Health Strength Feeling well Access to water 	
						Good social relations	
						 Social cohesion Mutual respect Ability to help 	
	Non-use values		Cultural • Aesthetic • Spiritual • Ethical • Inspirational • Conservation			others	



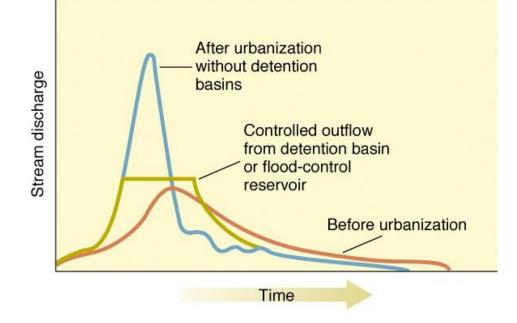
Methods

- Market Price (direct or indirect)
- Production Input (avoided damage, substitutes)
- Revealed Preferences
 - Hedonic Pricing
 - Travel Cost
 - Multi-site Recreation demands
- Stated Preferences
 - Contingent Valuation (willingness to pay)
 - Choice modeling
- Benefits Transfer



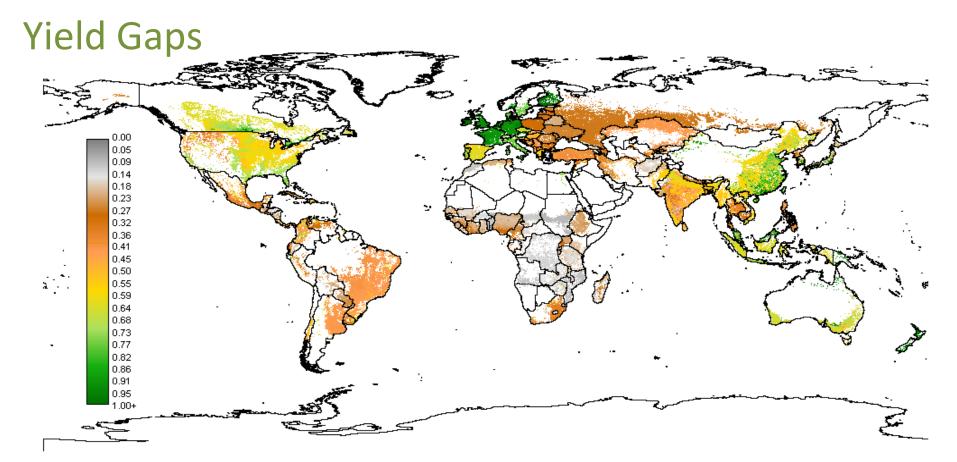
Methods: Market Price

- Opportunity costs
- Cost of alternatives
- Mitigation Costs
- Shadow Project
- Cost of illness
- Subsidy cost





Methods: Production Input Method



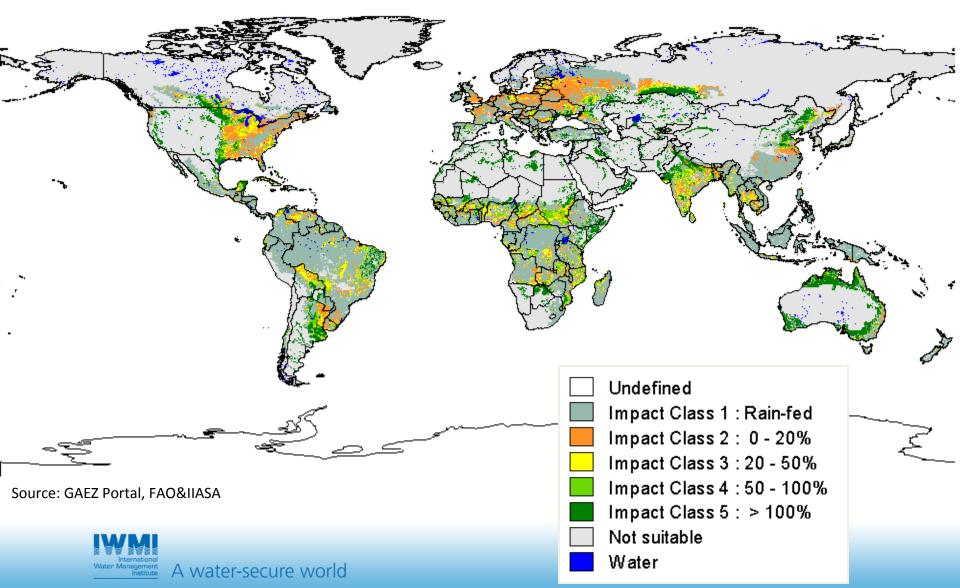
Yield gap ratios comparing actual crop production of year 2000 with potentials achievable in current cultivated land with advanced farming. *Source: GAEZ2012.*



Methods: Production Input Method

Where Irrigation Matters

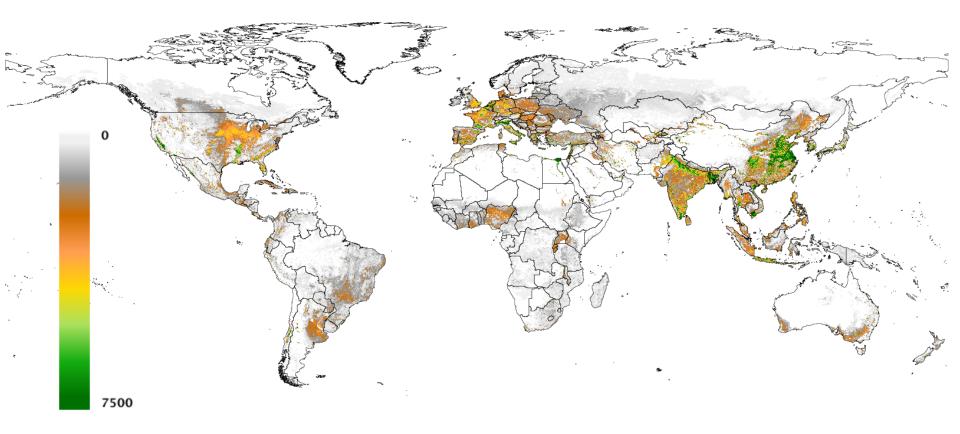
AEZ irrigation impact classes



Methods: Production Input Method

Total crop production value

(GK\$ by 5 min latitude/longitude grid cell)



Source: GAEZ Portal, FAO&IIASA



Methods: Revealed Preferences

Hedonic Pricing





- Travel Cost
- Multi-site Recreation demands
 - Where do individuals go more often based on perceived quality and quantity of natural resources



Source: Canadian Council of Ministers of the Environment, 2010

Methods: Stated Preferences

- Contingent Valuation Surveys
- Choice modeling
 - Several choices with different options and prices



Conclusions

- Water valuation improves resource planning, efficient and sustainable use.
- Helps develop and understand impacts of scenarios
- Market Price and Production Input Methods Suitable for large-scale modeling now
 - However, they are only proxies for true value
 - Other methods can help get closer to true value, but are highly context specific and difficult to implement on large scales
 - Benefits transfer methods could help.
- New databases are needed



Information Requirements

- Trends in water uses at basin/sub-basin scale (locations and times of use, quality required, technology used, developments over time)
- Policy/Institutional/Legal mapping (which organizations are responsible for which decisions, monitoring, enforcement, impacts of change)
- Options Analysis and Database (benefits, costs, impacts, synergies, tradeoffs)
- Priorities/Values Mapping (what are the priority options for <u>stakeholders</u> in the regions)

