

WATER AS AN ECONOMIC GOOD - POLICY IMPLICATION

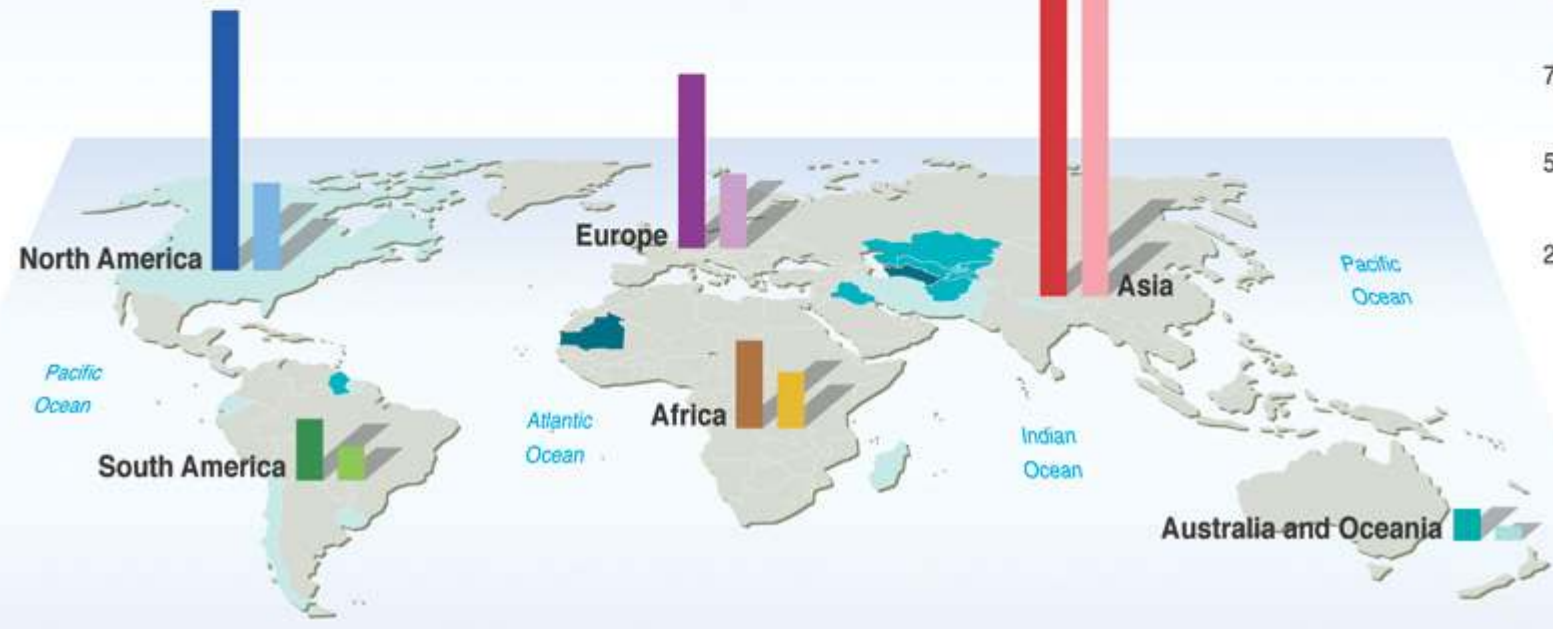
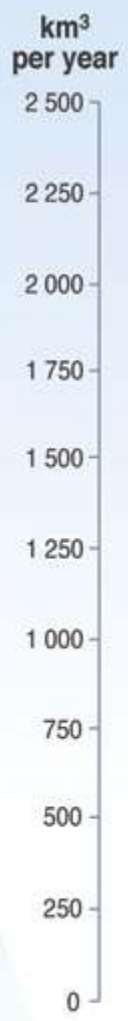
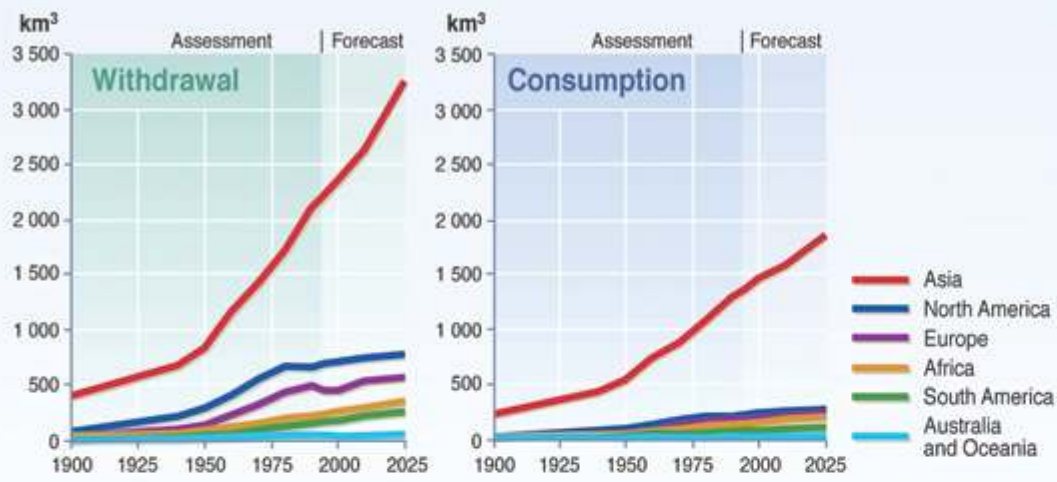
Paul P.Appasamy
Madras School of Economics

GLOBAL WATER WITHDRAWALS (1990)

Continent	Annual Withdrawal		% of Renewable Water Resources
	(km ³)	%	
Asia	2007	58.8	15
Africa	149	4.4	4
Europe	476	13.9	16
N.America	617	18.1	8
S.America	141	4.1	1
Oceania	24	0.7	1
Total	3414	100.0	8

Source: World Resources 2000-01

Global Water Withdrawal and Consumption



THREE LARGEST WATER USERS (1990)

Country	Annual Withdrawal (km ³)	% World withdrawal	% of Availability	Per Capita (CM)
China	525	18.3	19	439
India	500	14.6	40	588
USA	448	13.1	18	1677
Sub-total	1473	46.0	--	648

Source: World Resource 2000-01

- India and China account for a third of global withdrawal
- India, China and USA for nearly a half
- China and USA use less than 20% of their renewable water resources
- India uses 40% (may be an underestimate)
- Agricultural Withdrawal
 - China (77%) India (92%) USA (27%)
- Per Agricultural Withdrawal
 - Lower in India and China

IMPACT OF WITHDRAWALS IN INDIA

- * Predominant Water Use in Agriculture
 - Agricultural use is highly consumptive (75-80%)
 - Very little return flow to rivers
- * Scope for extending irrigation is limited
- * River flows are affected by excessive withdrawal
 - Environmental Flows cannot be maintained
 - Potential for dilution / assimilation affected
 - Estuaries will have inadequate fresh water
- * Shadow Price of Water in agriculture is very low

ECONOMIC VALUE OF AGRICULTURAL WATER USE

* Traditional Assessment:

- Return on Irrigation Infrastructure Cost
- Charges based on O & M cost

(Vaidyanathan Committee)

- Not based on value of water

* Water as Natural Capital

* Value of water in agriculture

- net value of crop output per unit of water
- Crop per drop / Water Productivity

* Quantity of water used: 462 cubic Km or 462 BCM
(1990)

* Economic Value : Rs.46,200 crores per year @ Rs.1 per cubic metre

VALUE OF WATER IN AGRICULTURE

<u>Case Study</u>	<u>Net Value of Crop Output / cubic metre</u>
Haryana	Rs.0.86
Subarnekha	Rs.1.22

Source: Rogers, Bhatia and Huber (1998).

- * Typically value of irrigation water is Rs.1 per cubic metre
- * Urban consumers purchase water from vendors at Rs.25 ₹ per cubic metre
- * Farmers prefer to sell water to other users rather than raise crops

ENVIRONMENTAL COST OF IRRIGATION

- * Environmental Flows to support aquatic ecosystems are reduced
- * Irrigated agriculture contributes pesticides and nutrients to surface and ground water
- * High levels of nitrates in ground water in Punjab, Haryana, Andhra Pradesh and Tamil Nadu
- * Productivity of Estuaries are affected

POLICY IMPLICATIONS

- * Re-assessment of water use in agriculture
- * Non-water intensive crops
- * Organic Farming
- * Virtual Water Option (State level)
- * Maintain environmental flows in rivers (NEP)

THANK YOU