

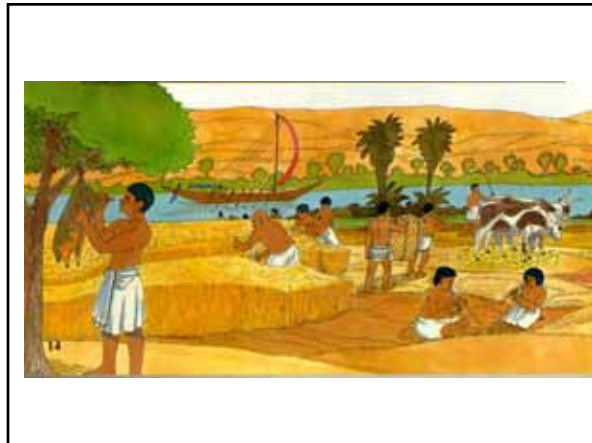
Historical Uses of Water

- Drinking water
→ Nomadic life styles
- Food production - Agriculture
→ First settlements

Ancient civilizations developed close to streams

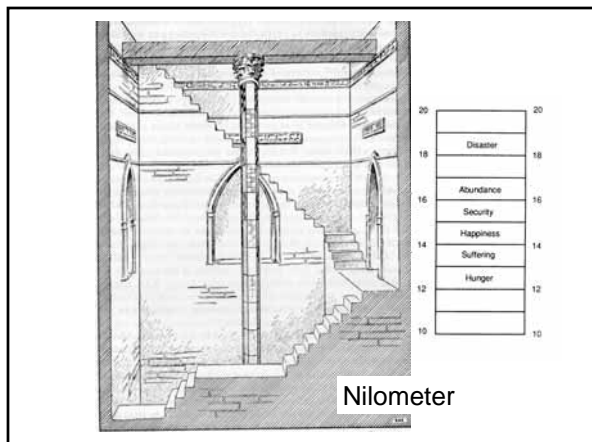


Egypt



World Oldest Gauging Station

Nilometer



Sustainability of civilizations associated with control of the water

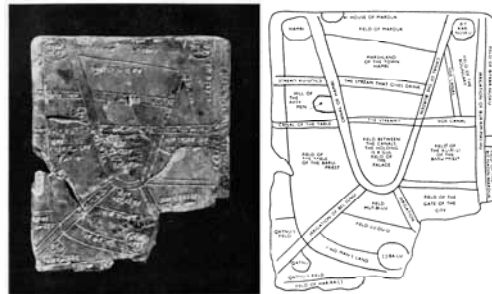
- Danger of Excess - Floods
→ Levee system
- Danger of Shortage – Water supply

Getting the water on the land



Water lifting devices

Redistribution of Water on Land



Irrigation canal system - Mesopotamia

Long Distance Transport

Aqueduct system - Romans



Pont du Gard (France)

Storage of Water



Underground Cisterns
Constantinople

56 Part of Constantinople's Cistern of 1001 Columns

Using the land and water efficiently



Terracing of the landscape - Peru

Historical Uses of Water

- Drinking water
→ Nomadic life styles
- Food production – Agriculture
→ First settlements
- Transportation & communication



Antwerpen, Belgium



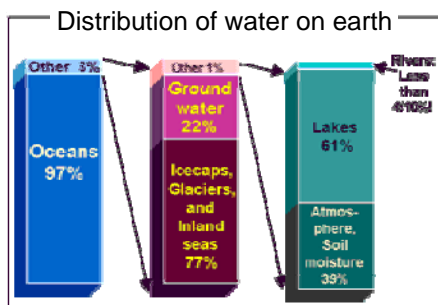
SUMMARY

Historical Uses of Water

- Nomadic life styles
 - Drinking water
- First settlements
 - Food production – Agriculture
- Prosperous civilizations
 - Control of water; Transportation




Abundance and distribution of water on earth



Distribution of water on earth

Oceans	97.2%
Icecaps	2.1%
Groundwater	0.6%
Lakes	0.02%
Atmosphere	0.001%
Rivers	0.0001%

Types of water use



In-stream use

This image shows several people wading in a river, engaged in fishing. They are using long poles and nets, which is a classic example of in-stream water use.

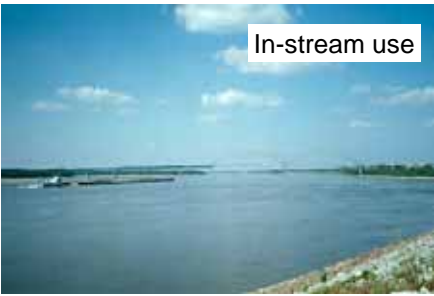
Types of water use



In-stream use

This image depicts a group of people in a raft navigating through white-water rapids on a river. This is another form of in-stream water use, where the water's flow is directly utilized for recreation.

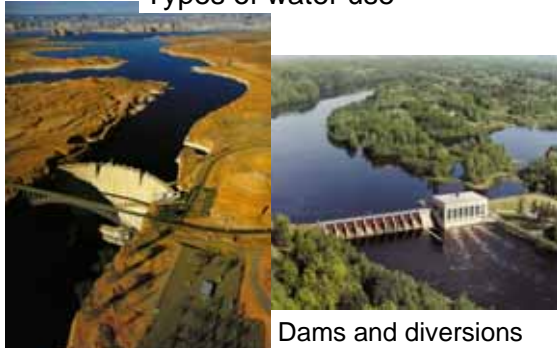
Types of water use



In-stream use

This image shows a wide, calm body of water, likely a reservoir or a large river section. The water is still, and the sky is clear, representing a typical in-stream water use scenario.


Types of water use



Dams and diversions

This image is a composite showing two different types of water infrastructure. On the left, a large dam is visible, and on the right, a smaller dam or diversion structure is shown in a lush, green area. These structures are used to control water flow and storage.

Types of water use

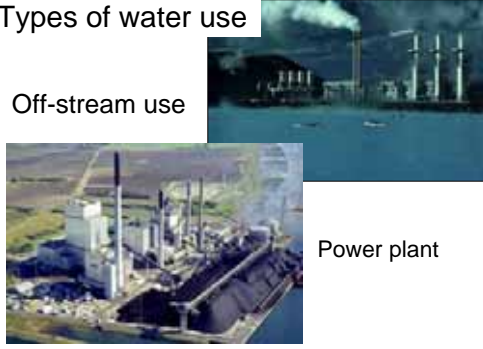


Off-stream use

Hydro-electricity

This image shows a large dam with multiple spillways, situated in a hilly, green landscape. This is a classic example of off-stream water use, where water is diverted from its natural course to generate electricity.

Types of water use



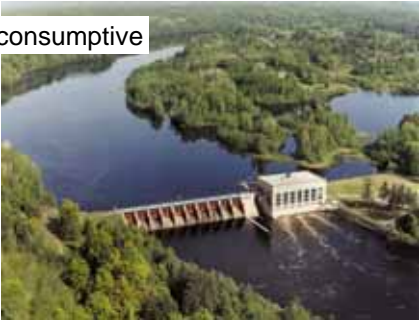
Off-stream use

Power plant

This image shows an industrial facility, likely a power plant, with several tall chimneys emitting smoke. The facility is situated near a body of water, illustrating off-stream water use for industrial purposes.

Types of water use

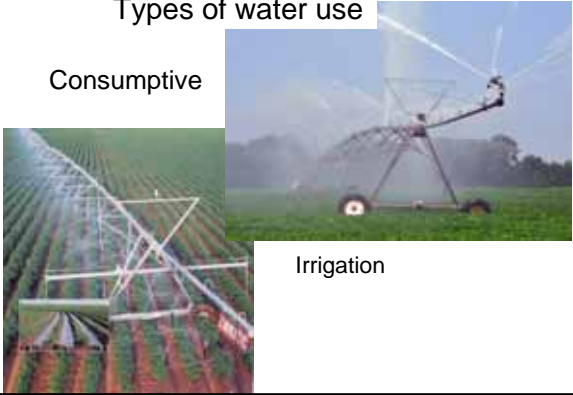
Non-consumptive



Types of water use

Consumptive

Irrigation



Types of water use

Consumptive



SUMMARY

Contemporary of water use

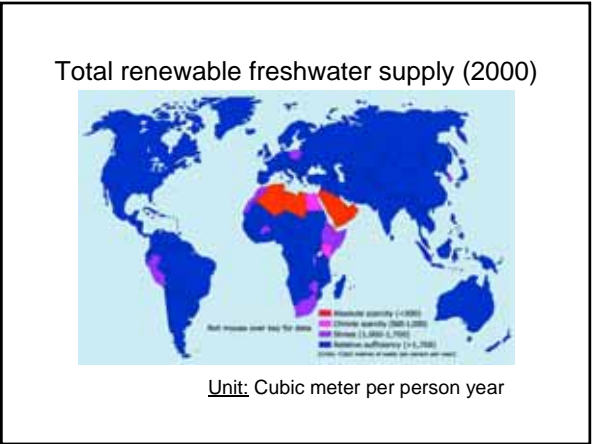
Most human use from a VERY SMALL pool (fresh surface water)

- In-stream use
- Off-stream use
 - Non-consumptive
 - Consumptive
 - (Return Flow)

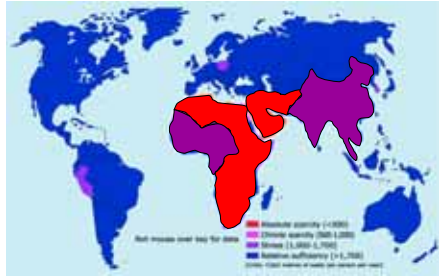
Worldwide water use (km³ yr⁻¹)

	1985	2025	%Total	% Consumed
Agriculture	2500	2650	66%	72%
Industrial	750	800	19%	12.5%
Municipalities	350	500	12%	20%
TOTAL	3800	4170		>50%

Source: Rodda 2001



By 2050 global water scarcity will increase



due to population growth (10 billion)



Bangladesh
Source: National Geographic
Photographer Karen Kasmauski



Calcutta, India
Source: National Geographic
Photographer Peter Essick

% population with access to SAFE water (2000)



What happens if standard of living increases?

