

Water Conflicts

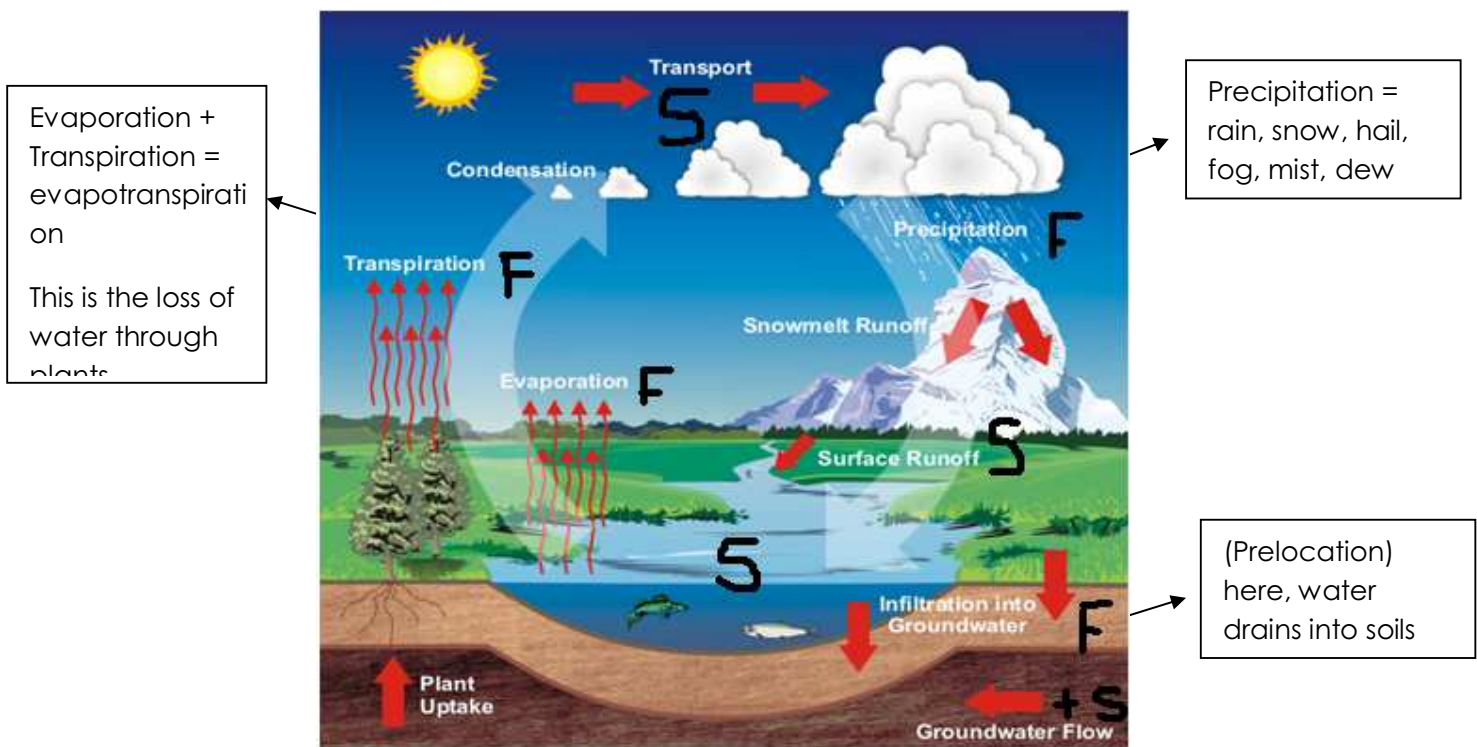
Water = Fundamental human need. ☹ Demand ↑ supply doesn't match!

Potential for local and international conflict is ↑

Future water supply is in doubt due to unsustainable use and climate change.

Vulnerable population = suffer most!


The Hydrological Cycle



Closed system → goes round and round, never any more or less in the system.

Water Crisis:

- ❖ Amount of water in world is limited. No infinite supply!
- ❖ Water = 2/3 of earth's surface. Most too salty = unusable.

- ❖ 2.5% not salty but unreachable (in glaciers and ice caps) Fresh water – 20% in remote areas and rest comes as flood water.
- ❖ Next 2 decades usage  will be by 40%
- ❖ 70% used in agriculture. 2020 need 17% more to feed the world.
- ❖ 1 in 5 worldwide cant access drinking water
- ❖ High child death due to hunger or diseases.



Reasons for the water crisis:

1. Growing population
2. Desire for better living standards
3. Inefficiency of water use

Solutions:

1. Irrigation systems, drip water into plants & precision sprinklers.
2. Plant less water intensive crops.

Human interference affecting water cycle:

- Salinisation → more water being pumped up, salt leaking in (over abstraction  water quality)
- Building of dams affects run off, upstream lots of water downstream not so much due to it evaporating.
- Urbanisation, build more houses  surface area, depletion of ground water.
- Evapotranspiration, deforestation stops this process. Chopping down trees could mean larger surface area for run of, water scarcity takes place.
- Cloud seeding (making own rain, acidity ruins quality)
- Transferring water, more water in one area less in another.

Where is all the water?

97.5% = Ocean water 2.5% = Fresh water 0.4% = Surface & Atmospheric water

Groundwater:

- Most rainfall soaks into soil, some further into the ground (infiltration)
 - Trickles downwards into rocks and becomes groundwater.
- Groundwater is vital in supporting wetlands and stream flows.

- Water table = level at which the rock has become saturated. ▲ An aquifer is water bearing rocks that are saturated.

Water supply is controlled by climate factors!!

Water supply is a **balance between precipitation totals** and **evapotranspiration potentials** and is controlled by aquifers.



Water pollution!

2 types:

Water Bourne = Typhoid and Cholera -> oral face contamination due to lack of sanitation

Water washed diseases: = Scarce water (drinking and cooking) 1st demand

Washing (leprosy) and Irrigation (luxury) 2nd demand

Mosquitoes → malaria, dengue fever, river blindness (water is a breeding ground)

Not just about quantity but the quality of water!

Ground water = pollution less obvious than surface water → aquifers become polluted, feed surface water = **Salinisation** due to over abstraction.

Salinisation = the process whereby soluble salts accumulate within the soil.

"Dilutions is the solution to pollution!"

With over 8 billion people on the planet, disposing of sewage waste is a major problem. In developing countries, many people still lack clean water and basic sanitation (hygienic toilet facilities). Sewage disposal affects people's immediate environments and leads to water-related illnesses such as diarrhoea

However in theory Sewage = natural substance that can be broken down harmlessly in the environment. (It contains all kinds of chemicals e.g.

pharmaceutical) ☹ people are sick virus is in the sewage and can become air Borne in environment, can catch cholera etc from rivers and seas.

Nutrients...

Sewage can be a fertiliser → returns important nutrients back to environment.
Chemical fertilizers used by farmers also add nutrients to the soil... HOWEVER
→

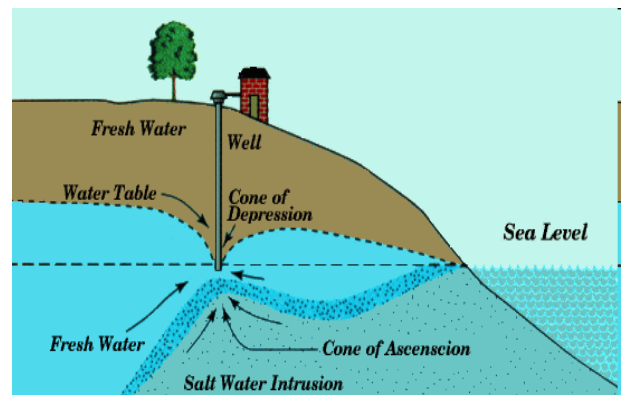
1. Drains into rivers and seas adds to fertilizing effects of sewage
2. Growth of algae or plankton, takes up oxygen → takes O_2 from water which kills other life forms!

Thermal pollution....

Factories releasing cooling water into rivers...

Salinisation of groundwater →

Deeper the well, more water being pumped up collects more salt water quality.



Cone of exhaustion →

Build the biggest well, getting all the water everyone else's dries up. Sell water to others leads to economic scarcity!

Case studies

Deepor Beel

- Permanent fresh water lake in the former channel of the Brahmaputra River.
- South of the main river.
- South west of Guwahati city.
- It is a large natural wetland having great biological and environmental importance.
- It's the only water storage basin for the city.
- Agricultural activities and farmers depend on the water lake.
- Designated as a Ramsar site (conservation of the land)



City grows → more waste is produced!

Dumped on outskirts of city polluting Deepor

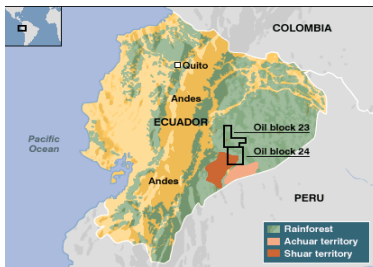
Deepor Beel is on a flood plain → when it floods water can flow into it.

Toxico, Ecuador

One of the most diverse regions in the world.

3 distinct regions (minus Galapagos):-

1. El Oriente → Amazon part of rainforest in the east.
2. La Costa → Western Pacific coast.
3. La Sierra → Andes Mountains, centre of country.



Operations up to 1992, Texaco **spilled 17 million gallons of oil** from pipeline and **dumped 18 million gallons** directly **into the rainforest, contaminating 1,700 square miles** leaving extremely dangerous conditions.

Oil was dumped into pits around the jungle, water spread into the rivers. Soil and rivers are so polluted that nothing grows, fish are all dying and drinking water is now poisoned.