Concepts of Global Water Use

The use of water can be separated into three basic areas: physical supply, legal availability and multiple uses. Physical supply is the amount of fresh water provided physically in the form of rainfall, and snowpack (precipitation), and as such is available for use in the rivers and lakes. One recent estimate from the World Resources Institute (WRI) is that the total amount of precipitation falling on the land surface is approximately 45 billion gallons, 140,000 Acre Feet (af), per year. Legal availability is that amount of water that an entity is legally entitled to take out of the existing physical supply, or the amount used. Multiple Use is the concept of using water for many and often conflicting uses such as drinking, bathing, cooking, agriculture, recreation, commercial and industrial.

Water Use on a Global Scale

These three concepts apply on a global basis. Water must be available to support life, and water can be denied to the end user based on the lack of physical supply, lack of legal right to use, or having too many conflicting uses for the existing resource. Conflict over water involves at least one, but often more, of these three areas.

Rivers provide the majority of the world's constant water supply. Two or more countries share river systems that drain slightly less than one-half of the world's land area. At least ten major rivers flow through six or more countries.

One example, the Euphrates River flowing from Turkey into Syria and Iraq is an area of conflict in several ways. Turkey has built major dams upstream, which withhold water from flowing into Syria and Iraq. Both countries are deprived of otherwise available water in the river (physical supply). The legal compacts negotiated by the countries are in constant dispute (legal availability). Each of the three countries needs ever increasing water supplies for drinking, and growing food (multiple use) because of increasing populations.

On the other side of the world, the Colorado River serves seven states and one foreign country (Republic of Mexico). This river is governed by a series of federal and state agreements and one international treaty between the two nations. This one river system currently provides water to over 17 million people and one million acres of farmland. Uses include recreation, industrial, agriculture and municipal water supply. There is demand for more and more water annually because of population growth and increasing use.

Even in wet regions, where water is seemingly not an issue, disputes arise. In the United States, Georgia, Alabama and Florida are disputing the flows in the Apalachicola River. One issue is the amount of water needed for the Apalachicola Bay oyster beds. Growth in Georgia and Alabama caused more and more water to be removed from the river (diverted) for municipal and agricultural use, leaving less for the ecosystem downstream. This impacted both the ecology of the bay and the livelihood of the fishing industry using the bay.

In local regions, water disputes are often complex. In Florida, the majority of fresh water comes from groundwater (wells). Pumping from groundwater for an increasing municipal use may be responsible for the decline in surface water and wetlands, affecting ecosystems and recreation. Once wetlands in Florida comprised 54% of the state's surface area, now they comprise only 30%. News stories about sinkholes affecting roads and buildings are becoming more and more common. Sinkholes are caused by the erosion and collapse of the limestone, dolomite or gypsum formations by underground water movement. Pumping moves the water both downward and horizontally.

The majority of the water on Earth's surface is saline and unusable for human consumption or for agriculture. Some is not in a usable form (i.e. trapped in the pores of solid rock). Conflicts arise because only about one percent of Earth's total water supply is fresh water and the fresh water supply is not increasing, but the population is. Even more important neither the water supply nor the population is evenly distributed, and often they are not located in the same place.

The World Bank estimates that eighty nations have water shortages severe enough to retard agricultural production.

Much of the world still lacks water for basic needs such as drinking and sanitation, however in many cases this is due to poor water management or lack of infrastructure resources. A recent WRI estimate of the percent of people worldwide with chronic water scarcity (lack of water for basic needs) is as follows.

Estimated Percent of World Population with Chronic Water Scarcity

2000…..3.7%

2025…..8.6%

2050…..17.8%

Water Quality Magazine noted the following in a recent article, "Shortages in nations everywhere are frequently combined with pollution problems." A 1997 United Nations (UN) report entitled Comprehensive Assessment of the Fresh Water Resources of the World concluded that "increasing water stress" is largely a result of "poor water allocation, wasteful use of the resource, and lack of adequate management action."

Water use per person per day in 1995 was estimated (USGS) to be 260 gallons globally. The United States in 1995 used an estimated 1,250 gallons per person per day.

This article is part of the Introduction to my book titled Understanding Water Rights and Conflicts, Second Edition.

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