Water Politics: Issues of Use and Abuse

By *Adrienne Lerner*

All communities are based around a source of water, whether an ocean, lake, river, stream, or well. Individuals need water for drinking, bathing, cooking, cleaning, and aiding the disposal of waste. Agriculture uses water for irrigation (water crops), aiding the production of a plentiful harvest even when rainfall is less than normal. Industry uses water for the production of electricity and the manufacturing of goods. Because water is so essential, nations, states, cities, and even individuals that share a water source must cooperate to protect their water from pollution and overuse, while ensuring a useable supply of water.

A billboard along I-94 in Michigan depicts four stereotypical characters from other parts of America all sucking water from Michigan's Great Lakes through straws to emphasize that Michigan's water was shared and used by other parts of the country. © 2002 Mark D. Heckman. Reproduced by permission.

How much fresh water communities or nations consume or use is known as their water footprint. Individuals and communities in different parts of the world use different amounts of water. For example, communities in the United States are some of the world's largest consumers of water, while communities in Northern Africa are among those who consume the least. Studying water footprints helps scientists see how communities use water. Studying water footprints also shows where water is wasted, helping communities conserve water. Sustainability, or using a natural resource in a manner that satisfies the immediate need while preserving the resource for future generations, is the ultimate goal for maintaining water resources.

In developed nations, fresh, clean water is supplied by a municipal (local) water works or individual well. A large network of pipes carries clean water to its destination for use, while another network of pipes carries wastewater away. Wastewater is cleaned and treated before being released back into the environment.

For some people, getting water may be easy as turning on a faucet; expelling wastewater as simple as lifting the stopper on a bathtub drain. However nearly 1 out of every 3 people in the world do not have access to clean drinking water on a daily basis Many more do not have a sanitary and safe way of disposing of waste and wastewater without polluting nearby water sources. Unsafe and unclean water can transmit diseases. Polluted water used for irrigation can ruin crops. Several international organizations, including the United Nations work to increase access to clean, safe, freshwater around the world.

Using and protecting surface waters

Surface waters include rivers, lakes, streams, wetlands, ponds, and the oceans. Oceans, rivers, and lakes that touch or flow through several nations require international cooperation to protect them from pollution and overuse. International agreements keep one nation from polluting or overusing a water source, such as a river, before it flows into another nation that is also dependent on the river as a water source.

In the United States, the Colorado River is a major source of freshwater for many arid (extremely dry) western states. The Colorado River also flows into Mexico. Parts of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming currently depend on some water from the Colorado River, its headwaters (source) or one of the tributaries (small rivers that flow from the main river). Use of water from the river sustains agriculture, provides water for use in peoples home (residential water use), and produces electricity.

The Colorado River is an example of a water source that is stretched to its limits. The growth of large cities, especially in California, demands an ever-increasing supply of water for residential use. Recent laws state that California must find another source of water for its southern cities. By 2015, California is scheduled to lose much of its access to Colorado River water. Agriculture in the dry region requires significant assistance from irrigation, which also uses river water. So much water is diverted from the

river for residential, industrial, and agricultural use that the large river is the size of a stream by the time it reaches the national border with Mexico.

Shrinking river volume and diminishing supply is not the only problem facing the Colorado River. The low volume of flow has made the water in the river more saline. Saline water has a high amount of minerals, the most common of which is salt. As the water becomes more saline it requires more treatment before being used for drinking water. Towards the end of the river, the mineral content of the water makes it unsuitable for irrigating some types of crops.

Using and protecting groundwater

Groundwater is also a source of water for residents, businesses, and agriculture. Large, underground, water-bearing rock formations are called aquifers. Aquifers are a source of clean, freshwater that replenishes when surface water from rain and snow seeps into the ground. This rate may be very slow, however. Fossil aquifers cannot replenish themselves or only do so after tens of thousands of years. Some of the largest and most used aquifers in the world are fossil aquifers, such as the Artesian Basin in Australia and the Ogallala aquifer in the United States. Other fossil aquifers lie beneath the surface of Africa's Sahara and Kalahari deserts.

In many parts of the world aquifers are endangered by over-use. The supply of water in an aquifer lowers when water is pumped out of an aquifer at a faster rate than it is replenished. If water is taken rapidly from an aquifer, then a cone-shaped trench may form at its bottom. As this depression grows and more water is drawn from the aquifer, the water level inside the aquifer will drop faster than it would with pumping alone. This is known as mining or water mining.

Taking too much water from an aquifer causes the water table to drop. The water table is the level underground at which water fills every space in the underlying rock. As the water table drops, surface soil often becomes drier. A low water table can kill tress and vegetation whose roots can no longer reach enough water. People who depend on a well for water may have to dig new wells or deepen their existing wells. Aquifer depletion also affects the level of local streams, springs, and rivers fed by the aquifer. Water for household, industrial, and recreational use could become scarce if the aquifer is the only local source of water. The system of water rights decides who gets to pump what amount of groundwater from an aquifer and what uses of water are most important for the community as a whole.

Ogallala Water Mining

The Ogallala aquifer is one of the world's largest fossil aquifers. Located on the American high plains in Nebraska, it provides irrigation for some of the most productive farmland in the United States. Water from the aquifer sustains 25% of the nation's cotton crop, 15% of its corn and wheat, and nearly half of all cattle raised for food. As more residents move into the region water is increasingly mined from the aquifer. The Aquifer is a key source of water, but people are pumping water from the aquifer eight times faster then the aquifer can refill itself. By the year 2050, half of the Ogallala aquifer's supply of fresh water will have been pumped out of the ground.

Eventually the aquifer could be pumped completely dry, depriving the region around the aquifer without the water necessary to sustain large farms or cities. Recent laws have set out to better govern the pumping and use of Ogallala aquifer water, but because it is the main source of clean, freshwater in the region, pumping cannot be stopped. Scientists are experimenting with a system to artificially recharge the aquifer by pumping in rainwater. While this will aid the overall water level it is unlikely to replace most of the water mined from the Ogallala aquifer.

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http://go.galegroup.com/ps/retrieve.do?sgHitCountType=None&sort=RELEVANCE&inPS=true&prodId=GVRL&userGroupName=lom_algonquin&tabID=T003&searchId=R6&resultListType=RESULT_LIST&contentSegment=&searchType=BasicSearchForm&currentPosition=5&contentSet=GALE%7CCX3437400122&&docId=GALE|CX3437400122&docType=GALE&role=

Name_____ Hour _____ Date _____

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1. List the ways that the following groups need or use water:

A.

B.

C.

2. What are the two major things that entities protect against when they share a water source?

3. Connections Question: What is one of the methods that agriculture uses for irrigation in our country. In other words, how are they using the water from the Ogallala Acquifer on their fields?

4. Connections Question: When people agree not to pollute or overuse the water source, they are ensuring that the water source will endure and be around to use indefinitely. What is the word that means that a source will endure?

5. Define water footprint.

6. Identify the communities in the world who have the largest and smallest water footprint:

Largest = Smallest =

7. Connections Question: In the video Blue/Gold, what was the community in the United States that has a large water footprint?

8. Connections Question: Is the community you listed in #7 sustainable? Describe why or why not?

9. Define Sustainability:

10. What are the two things that a developed nation offers to its citizens in terms of water?

A.

B.

11. How many people do not have access to clean drinking water daily?

12. How does that number compare to how many do not have a safe and sanitary way to dispose of waste?

13. What can happen to people if water sources are unsafe and unclean?

14. Water does not belong to one country. When a body of water goes through more than one country, international agreements are made. What do the international agreements keep another nation from doing?

15. Why is the large Colorado River only the size of a stream once it enters Mexico? List 3 reasons.

A.

B.

C.

16. What has the decrease in the flow volume of the Colorado River done to the water quality?

17. If a water source becomes more saline, what does it mean in terms of drinking water and irrigation?

18. Define aquifer:

19. How are aquifers replenished?

20. Connections question: How do cities affect aquifers being replenished?

21. What type of aquifer is the Ogallala aquifer?

22. How long can it take for a fossil aquifer to replenish itself?

23. How does the supply of water in an aquifer lower?

24. What can taking too much water from an aquifer do?

25. Define water table:

26. What are three things that can happen if the water table gets too low?

A.

B.

C.

27. If the aquifer is depleted, it could then affect the level of local streams, springs, and rivers fed by the aquifer. How would this affect the community?

28. How is the Ogallala aquifer being used currently? List four ways (three of which have a number associated with how much it supplies).

A.

B.

C.

D.

29. How much faster are people pumping out the Ogallala aquifer than it can refill itself AND at this rate when (what year) will half of the supply be gone?

30. Even though there have been laws made to better control the use of the Ogallala aquifer, pumping cannot be completely stopped. Why?