

California Water Crisis

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December 11, 2015

The state of California is one of the most productive states in the union. According to the California Department of Food and Agriculture, the state generated 54 billion dollars in revenue in the year 2014 and accounted for approximately 15 percent of the United States agricultural exports in the year 2013 [1]. However, not all is well in the Sunshine State. California is currently experiencing a common-pool resource problem which involves water for human use, consumption or otherwise. The common-pool resource problem is not one concerning the scarcity of water, but one of the distribution of water. The commons dilemma in California is the imperfect provision of public infrastructure for water distribution. In this paper, we will discuss some of the governance challenges involved with the common-pool resource problem.

Some governance challenges in the commons dilemma include path dependency, slow adapting rules-in-use, pervasive incentives and sunk costs. Before discussing the current situation, we need to discuss what happened in the past to examine how this commons dilemma evolved.

The two main sources of water in California are surface and ground. Surface water describes water that is concentrated in space and time in the form of lakes or reservoirs, or water that flows on the ground such as a river or stream. Some of this water comes from rainfall and some comes from melting snow pack from mountain tops far away from where the water is used. A major source of water for California, and the western United States, is the Colorado River. The Colorado River moves water from Rocky Mountains to the Gulf of California. This water is then delivered to settled parts of California by an intricate system of reservoirs, aqueducts, power plants and pumping plants by governing bodies such as the California Department of Water Resources [4]. the California Department of Water Resources is the governing body that regulates water in the state of California. However, this department may not be set up to handle a water system of this scale. In a UCLA report, researchers found that California water agencies do not

really know how much water is lost in pipe leaks or breaks [8]. According to Reuters, the California Department of Water Resources has little oversight in the contracts it hands out and may not know exactly how many public utility agencies are operating in the state [5]. Groundwater on the other hand, is water found concentrated in space and time in underground cavities or aquifers and is mostly pumped out by private wells.

Water distribution among the western states (also split up between Upper Basin and Lower Basin states) and Mexico is governed by the Colorado River Compact of 1922. According to The National Academies of Science, the Colorado River Compact of 1922 “was based on a short record of relatively high annual flows” [2]. It appears that there was a robustness-fragility trade-off when framing this compact. The compact allocates water rations and surpluses to states, but leaves them open to fragilities such as drought which is the current case. While the Colorado River Compact of 1922 governs the allocation of water between the western states, California’s Water Right Law governs the allocation of water within the state. The Water Right Law states that a landowner can use water on their land without approval [3]. California law also governs groundwater allocation. California’s Ground Water Rights state that landowners can extract percolating groundwater without approval from the State Board or a court as long as it is put to beneficial use [3].

These laws help create a governing challenge of path dependency. The State of California will have to govern the commons with many laws that were put in place years before the common-pool resource problem was noticed. These laws were also made by people who discounted the future. For example, some of the water rights in California were adopted from English common law [3]. The other governing challenge created by path dependency is that the rules-in-use do not adapt to the changing biophysical context. For example, as it was said in class, no state has challenged the Colorado River Compact of 1922. With a growing population and suspecting that the water rations were determined in a time of plenty, one would think that it is just a matter of time before a state decides to take the Colorado River Compact to court. States disputing water right is not unheard of. Currently, there is water dispute between Florida, Georgia and Tennessee which goes by the moniker “The Tri-State Water Dispute”. This water dispute has made it to the US Supreme Court [6]

California’s water right laws also create another governance challenge that can be described as pervasive incentives. Since the water laws allow landowners to extract groundwater underneath their land without any approval from a regulatory body [3], this can easily lead to a situation similar to the well-known Prisoners’ Dilemma in game theory. In this game theoretical representation of the action situation, it would make sense for landowners,

mostly farmers, to over-exploit the groundwater resource. However, this behavior is hard to quantify. How much do farmers over-exploit such systems? In a study regarding groundwater pumping, it was found that only 2.5 percent of the water used was over-extracted [7]. It should be noted that the study was done in Kansas, which might have different cultural aspects that affect resource use behavior.

The last governance challenge considered can be best described as possible sunk costs. One can only classify an investment as a sunk cost *post hoc*. California has undertaken several educational efforts with sites such as www.water.ca.gov/education and www.californiawaterfix.com. In the website titled California Water Fix, it is claimed that the California water system is outdated and unreliable. The project is expected to cost the residents of California five dollars per person. This governance challenge can also be classified under path dependency. One is left investing in inefficient systems because of uncertainty in investing in new systems.

Water is very important to the western states. Without the Colorado River Compact of 1922 and the many projects that came after such as the Central Arizona Project, it is easy to imagine that there would be less people residing in these areas. While California faces many water distribution challenges, there are many positive attributes that will help them. Currently, the state of California has a water plan (www.waterplan.ca.gov) and a governor's drought plan (www.ca.gov/waterconditions/declaration) that should have a noticeable impact on the current action situation.

References

- [1] "California Department of Food and Agriculture." CDFA STATISTICS.
- [2] National Research Council, Colorado River Basin Water Management, National Academies Press, Jun 1, 2007
- [3] "California Environmental Protection Agency." State Water Resources Control Board. The Water Rights Process.
- [4] "California Department of Water Resources". State Water Project.
- [5] "In California drought, big money, many actors, little oversight". Reuters.com April 25, 2014.
- [6] "Water wars between Florida, Georgia advance at U.S. Supreme Court". Reuters.com November 3, 2014.

- [7] Pfeiffer, L., Lin, C., Groundwater pumping and spatial externalities in agriculture. *Journal of Environmental Economics and Management*. July 2012, Vol.64(1): 16–30.
- [8] “California water agencies don’t know how much their pipes leak, UCLA reports finds.” newsroom.ucla.edu July 24, 2015.