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As Ellen Hanak explained in her article “California Water Myths”, California has experienced a water drought for several years, and it continues to be a current problem. Researchers have argued that the issue of the drought cannot be resolved, however, research has supported that the increase of water availability in California is attainable. California is once again in the intense debates about how to manage one of its most important natural resources - water. The common idea of California running out of water has been debated, but the following research has shown that solution can be found to further improve water availability.

Several years of dry weather have depleted reservoirs and groundwater basins. Californians have also seen a continuous annual increase in water bills. Per Los Angeles Department of Water and Power, LADWP’s water rates use tiered prices that are charged based on a customer’s water consumption and increase progressively with each tier or level of water allotment. The new water rate structure expands the number of rate tiers from two to four for single-family residential customers. The expanded tiers reflect the increasing cost of supplying more water to customers who use higher amounts of water. The tiered rates allow LADWP to recover the costs of providing water to high users while also having the effect of encouraging customers to conserve.

Asking or holding California businesses and residents to conserve can be both challenging and many times disputed. A main reason is the savings vs growing cost to replace landscape with drought tolerant alternatives, even with several government tax credits. It is challenging to understand the urgency of California's water supply resources. The state has historically experienced drought periods that expanded a time frame of years, and yet many lawns in lucrative communities still maintain a lush, green lawn. A multitude of wasteful water rides, waterfalls, and fountains in upscale communities, theme parks, shopping centers, etc. can allow a Californian to second guess if their state is in a situation of dire need. Mandates also follow similar fashion when it comes to placing effective policy regarding water control and conserving availability.

The on-again-off again conservation mandates are not regulated nor consistent. This adds to some DWP and other California water suppliers/consumers to speculate if conservation is necessary. Regarding a broader Los Angeles County scale, Mark Gold, associate vice chancellor for environment and sustainability at UCLA, stated, "When you look at the Los Angeles River being between 50% and 70% full during a storm, you realize that more water is running down the river into the ocean than what Los Angeles would use in close to a year." Water that can be allocated to necessary avenues are being wasted away into the ocean. Peter Gleick, president emeritus of the Pacific Institute for the Los Angeles Times, supports Gold by stating, "We still lose a tremendous amount of water to fast runoff that we know can be captured. We're not doing all the things we need to be doing," Gleick also goes onto to explain how water flows in major quantities during a storm. Water that is drained into a flooding system out of infrastructural safety is necessary, however, a great amount of that water can be captured. When the LA River was first built in 1960, the city was focusing on how 50 miles of man-made river could eliminate the liability of flooding; however, they failed to realize the future need for solution when it

came to conserving and reallocating water. This failure, and many other similar ones, have led to drought patterns.

Dana Nuccitelli, a writer for Yale Climate Connections, states that a lack of rain and snow is called a ‘meteorological drought.’ A 2018 study in *Nature Climate Change* used climate models to predict that California's precipitation patterns would change to a hotter climate with more rain falling in the winter but less in spring and fall months, making California’s dry season longer. California agriculture, as a result of drought, has also damaged forests and worsened wildfires. According to the Fourth National Climate Assessment Report, the combination of worsening droughts and expanding bark beetle populations due to warming winters has killed 7% of the western U.S. forest areas over the past four decades. The hotter and drier conditions during most of the year, combined with the dead trees, have created more fuel for wildfires, which the report concluded have burned twice as much area in the southwestern states over the past three decades as would have burned in the absence of human-caused climate change. Nuccitelli, also shared his findings on a 2018 study in *Geophysical Research Letters* that estimated that global warming has already shrunk the Sierra Nevada snowpack by about 20% and increased early-season runoff by 30%, and that each additional degree Celsius of warming will shrink the snowpack by about another 20%.

Snow drought in California can then lead to “hydrological drought,” when water levels fall in rivers, lakes, and streams. In June 2021, California’s reservoir water levels were about 40% below the historical average, and the snowpack was completely gone more than a month earlier than normal. As water resources experts at the Pacific Institute wrote earlier this month, there are steps that southwestern states can take to mitigate drought impacts. Some of these steps included “...changes in the efficiency of urban and agricultural water uses, the expansion of non-traditional water sources like stormwater and recycled water, and voluntary changes in behavior.” Curbing greenhouse gas emissions from fossil fuels

is of course the most important measure to lessen the threat of megadroughts in the future and their impacts on one of America's key food-producing states, such as California, who is the top producer of almonds, wine, and garlic. The Pacific Institute also breaks down the use of water in California and how much of a necessity it really is. The institute explains that 80% of water is used for agriculture while the remaining 20% is for urban use. The institute also breaks down how much "applied water" is utilized within the state. Applied water is defined as water that is utilized for beneficial use. The amount of applied water that was used in California was equivalent to 79.8 million acre-feet. On the other side of that statistic, the amount of water that was depleted was equivalent to 58.3 million acre-feet. Major water sources have accounted for where California attains most of their water, regardless of its supply is being depleted or utilized appropriately. Rachel Becker was saying that between 2019-2021 that the California has not been getting a lot of rain fall. Northern California was the driest out of every other area in California. The grasp of drought deviates from exclusive counties. The County town is dumped with potable reuse and porewater markets. In another resident they are requested to diminish maneuver. The environmental architecture sustains the region it keeps the packed water even when little sinks from the sky. The first thing that happened in Los Angeles adequate, which was upfolded by the San Fernando Valley capitalist and was accepted by the citizens in the year 1905, inhaling mountains-fed streams in the Owen Valley and capitating it 137 miles out. For some reason that wasn't enough for them. Along came the Metropolitan Water District's adequate, illustrating from California's division of the Colorado River, spiraling along the desert and burrowing past mountains to distribute water to the Los Angeles basin in 1941. That wasn't enough for them either. They finally found way around it. The confederate in the 1960s started to undertake construction by immense network to convey the river water in North California, injecting it above the Tehachapi Mountains and across 700 miles of pipelines

and narrows to provide to San Joaquin farmland and 27 million individuals, mainly in Southern California.

According to San Diego Coastkeeper, California has five major water supply systems: local, federal, state projects, groundwater, and the Colorado River. California is considered one of the most physically altered states in order to cater to the need for water supply; the state is filled with reservoirs, man-made rivers, and dams. Due to infrastructure and water system efforts, California can support the population of 35 million people, according to watereducation.org. California is coming on top on the agricultural sector of the nation. However, the working water system has come with its own consequences. According to watereducaction.org, wetlands have been lost, the fish population is depleting, and the natural water flow has been altered. In order to see real solution, policies and procedures implemented by the government, locally and nationally, will be needed.

Local and government policies have been put in place regarding water conservation that have started the process of finding credible solution for the drought problem of California. One of the most recent policies that has been put in place in order to enforce water efficacy continues to ensure that households are monitoring their natural intake of water, according to CBS Sacramento. Policies, such as these, account for a household's size, water use, and how much they overuse, which leads to accountability and natural waste to decrease. According to CBS Sacramento, 2022 will be a year that witnesses even more security efforts regarding California water policy. In 2022, households will only be allowed the use of 55 gallons per person per day, and by 2030 it will fall to 50 gallons. As strict as these policies seem, infrastructure efforts have not proven to be enough. The damage that comes from the unnatural disruption of land has led to consequence. Policies that promote water control and monitoring can also lead to the rising livelihood of water availability.

Water availability in California has been a widely debated topic, both in political and social climates. As Californians continue to waste water and infrastructure has seen a decline in natural resources, policies that are in place and will continue to be implemented are needed to ensure water availability continues to grow to support California's growing population and demand. California is in a drought, but water is not a fixed variable. Water can be monitored, reallocated, and redistributed to the proper channels through policy and intervention.

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