



The Tohono O'odham: Desert People in a Changing Environment

Background

Since the beginning of O'odham history, the Tohono O'odham of southern Arizona and northern Mexico have adapted to high summer heat and water scarcity. Until a century ago the tribe lived in the mountains, descending to desert lowlands from spring through late summer to capture monsoon rains and practice "flood farming" of corn, squash, beans and melons, and to gather desert foods that include cholla buds, saguaro fruit and tepary beans.



Around 1920 the Bureau of Indian Affairs began drilling permanent wells on the sprawling Nation's desert floodplains, and the tribe's 63 communities relocated permanently around those sites. Over time they have also shifted from a diet of traditional foods to more of a Western diet, leading to health problems, most significantly diabetes, that impact a large percentage of tribal members.

In recent years, as climate change disrupts the tribe's traditional and modern ways of living, the O'odham people are examining short- and long-term solutions through the development of a Climate Change Adaptation Plan. The draft plan is under review and scheduled for release in the summer of 2017. Its final details are not yet available, but the plan will address a variety of challenges that impact the tribe's communities and O'odham culture.

Water—Too Little, Too Much

Long-term drought, which researchers have linked to climate change in both frequency and longevity, stresses O'odham water supplies and food sources. The winter-time "Mother Rain," says the tribe's Water Resources Director, Selso Villegas, has diminished, and summer rainstorms are fewer but often more intense. Wood-and-stucco homes, which have slowly replaced traditional adobe homes on the Nation, sustain greater flood damage than adobes. "They should have been built on two-foot pedestals," Villegas says, "but they're not, so the flooding comes straight to their doorways. We've always had flooding problems here on the Nation. About 15 of our communities...have been affected by '50-year floods'. There are four places I stress about the most [Santa Rosa Valley, Menager's Dam, Chui Chu Village and Vamori Village]. If we get a '100-year flood' event, those communities may be devastated."

Hot and Getting Hotter

Historically, to cope with searing daytime heat the O'odham people constructed *wattos*—open-air shade structures, with dirt floors which they wet occasionally—to which they would retreat

during the hottest hours. In order to offset the heat, the newer HUD homes will be built with air conditioning units. However, there will be an additional cost for electricity during hot days. At night the people would open their windows to cool their homes; these days, Villegas says, warmer temperatures linger long into the night, extending the need for air conditioning.

Food Security

The Nation encourages members to return to a more-traditional diet and to maintain small “victory gardens.” Currently, the Tohono O’odham Community Action, a non-profit organization; the tribe’s Food and Farming Working Group, and the Tohono O’odham Community College’s Land Grant Office of Sustainability are growing food and leading a cooperative effort to promote home gardening. “We’re growing tepary beans, squash and melons,” Villegas says, referring to some of the tribe’s traditional foods.

Food scarcity is not yet an issue for the tribe, but hardy desert plants and the traditional foods they produce are already impacted by changes in rainfall and average temperatures. “Climate change is altering the phenology of our plants,” Villegas says. “People are going out to gather food and they’re saying, ‘What’s going on? They’ve already bloomed.’” Climate scientists, he says, predict average end-of-century temperature increases of about nine degrees Fahrenheit. “We don’t know what that means for our traditional survival foods—you can’t reproduce a cholla or a saguaro.”



Figure 1 Saguaro flowers beginning to wither as the buds turn to fruit. Photo by Dennis Wall.



Figure 2 Prickly pear. Photo by Dennis Wall.

If rising heat and sustained drought (which researchers tie to climate change) stoke future food shortages, the Nation’s budget could be strained by the need to subsidize food purchases. Even with tribal and even federal support, obtaining bulk food, and getting it out to tribal members, could strain the tribe’s distribution infrastructure: “We don’t have enough cooling capacity to store perishables, Villegas says, “and we have just two food-distribution trucks to cover 2.8 million acres.”

Actions and Options

The tribe’s final Climate Change Adaptation Plan will likely address these and other climate-related issues, including human health and wellness, ecosystem management, and financial sustainability during major climate events. The plan will incorporate observations and priorities of tribal members, informed by research drawn from various sources that include the University of Arizona’s Center for Climate Adaptation Science and Solutions, a local O’odham partner.

As mentioned earlier, new HUD homes are being built with central air units to address the rising heat, and the tribe looks to encourage wider spacing of HUD-built homes and *watto* construction.

Emergency management, another tribal focus, will center primarily on impacts of flooding on O'odham residents. The U.S. Army Corp of Engineers (USACE) has analyzed several areas prone to flooding on the Nation and has offered potential solutions. The USACE has provided a reconnaissance report to reduce flooding in the Santa Rosa Valley under the Tribal Partnership Program, Section 203. The Corp has also provided a feasibility study for potential flooding in and around the Chui Chu village as part of a larger study to control flood waters in the Santa Cruz River drainage.



Figure 3 Prickly pear bloom. Photo by Dennis Wall.

Food security measures will likely include seed-banking of traditional plants, expanding food-crop acreage, finding better ways to get water to crops, and enhancing the tribe's food-distribution infrastructure. Long-term inventory and monitoring of wild food plants is underway.

The still-developing plan, says Villegas, "won't cover every climate impact in detail—it's just to start the discussion on possible things we can do with what we have now."

He believes it will serve as an important

partnering tool into the future. "Everyone around us will be going through the same things, so we may need to develop partnerships with the county, the state, federal entities. They're already our partners, even if they don't know it. At some point they'll ask, 'Do you have any plans?' And we'll say, 'Yes, we do, and here they are.' And maybe we can do something together."

Resources and References

- Tohono O'odham in Arizona Fact Sheet: <http://bia.gov/WhoWeAre/BIA/climatechange/Resources/Tribes/TribalFactSheet/index.htm?tcrp=Tohono>
- Craftsmanship Quarterly – Food Shift: <https://craftsmanship.net/food-shift/>
- Tulalip News – Historical crops in Arizona may be the future of agriculture: <http://www.tulalipnews.com/wp/2015/05/12/historical-crops-in-arizona-may-be-future-of-agriculture/>

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Affairs. The profile is available on the Tribes & Climate Change website: www7.nau.edu/itep/main/tcc/Tribes/. The tribal climate change profiles featured on the website are intended to be a pathway to increasing knowledge among tribal and non-tribal organizations interested in learning about climate change mitigation and adaptation efforts.

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