

Dams, Fish, and a Modern Dust Bowl: Narratives of Drought Vulnerability and Adaptation in California's San Joaquin Valley



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Executive Summary

- Within the drought risk management literature there is a call for research that examines the socio-economic complexities of drought impacts, especially for economic and socially marginal groups who rely on low-wage and seasonal jobs (Dow, 2010). The current California drought provides a case study for understanding how different stakeholders within the San Joaquin Valley identify drought impacts and what physical and social factors shape drought vulnerability in the region.
- The production of user-inspired knowledge requires understanding the wider context of environmental problems, defining users and their perspectives, and understanding the value and credibility of information needs (Jacobs *et al*, 2002). As droughts are both a physical and social event, it is important to understand how the experiences and perspectives of different stakeholders affected by the drought. In order to understand how drought impacts and drought vulnerability are being experienced in California's San Joaquin Valley, interviews were conducted with different agricultural stakeholders, including farmworkers, farmers, agricultural trade representatives, social service providers, government representatives, and social and environmental activists. In addition, participant observation was conducted on farms and during food distribution events in rural communities.
- Interviews with stakeholders were used to outline the main environmental narratives that frame how physical and social factors produce and intensify drought vulnerability for rural farming communities in the San Joaquin Valley. While the different narratives identify different drought "villains," such as environmental regulations or farmers, they hold in common an understanding that investment in agriculture and rural communities is necessary in order to address drought vulnerability for future droughts in the region.
- Next steps include a narrative analysis of the national media coverage of the drought as well as major drought policy documents to compare local narratives to national and policy discourses on drought vulnerability.

Introduction

California is in the 4th year of an extreme drought. Lack of rainfall and warm temperatures have led to decreased snowpack critical for water use by cities and agriculture. On April 1st 2015 snowpack measured at 5% of average. Currently the US Drought Monitor categorizes over 40% of the state as Exceptional Drought (US Drought Monitor, 2016). In response to the drought, surface water allocations to farmers in California's San Joaquin Valley through the State Water Project and the Central Valley Project were dramatically reduced or cut entirely for 2014 and 2015. Economic models estimated that the 2014 led to the loss of 17,100 jobs and \$2.2 billion from California's economy (Howitt *et al*, 2014), while estimates for 2015 included the loss of 21,000 jobs (Howitt *et al*, 2015). The full impact of the drought on farmers and farming communities in the agriculturally prolific San Joaquin Valley is still unknown. Of special concern are the impacts of the drought on small rural communities and farmworkers who already experience high levels of poverty and uneven access to basic social services.

Drought impacts are a product of not only the physical intensity of the drought, but also the economic, social, and environmental characteristics of a region. However, drought impact assessments and drought management policies continue to be driven by physical science framing of drought (Lackstrom *et al*, 2013). Within the drought risk management literature there is a call for research that examines the socio-economic complexities of drought impacts, especially for economic and socially marginal groups who rely on low-wage and seasonal jobs (Dow, 2010). The current California drought provides a case study for understanding how different stakeholders within the San Joaquin Valley identify drought impacts and their local understanding of how social and physical factors affect the region's capacity to respond and adapt to drought.

Project Design and Methods

The San Joaquin Valley

Favorable climate, soil and water access has allowed California to become a world leader in the production of fruits and vegetables. This leadership relies on a large labor force harvesting labor-intensive fruits and vegetables. The majority of farm labor in the San Joaquin Valley is made up of undocumented migrant workers who do not have access to social services and suffer higher rates of food insecurity (Brown and Getz, 2011). The Human Development Index used by *The Measure of America 2013-2014* report to measure well being in the areas of health, education, and income rates the rural areas of the San Joaquin Valley (specifically California's 21st Congressional District) as the lowest in the country in well-being (Lewis and Burd-Sharps, 2014). The high level of poverty in an agriculturally dependent region

Environmental Narratives

The production of user-inspired knowledge requires understanding the wider context of environmental problems, defining users and their perspectives, and understanding the value and credibility of information needs (Jacobs *et al*, 2002). The identification and analysis of environmental narratives allows for defining stakeholder perspectives and local knowledge as it identifies the storylines that different people use to explain

environmental problems (Adger, 2001; Harris, 2009; Lejano *et al*, 2013). These storylines are narrative arcs that include heroes, villains and victims as well an implied policy prescription – the implied “moral of the story” (Jones and McBeth, 2010).

Research Methods

Semi-structured interviews were conducted with 24 persons involved in agriculture, government, and social services in Fresno and Tulare counties. In-depth interviews are useful for collecting knowledge of an individual’s lived experience and perspectives, thus providing an important text for narratives of drought and drought vulnerability in California (Johnson and Rowlands, 2012). A broad group of persons were selected in order to cover a wide variety of perspectives of the impact of agriculture on farm labor and rural communities. These included farmers, farmworkers, water irrigation district representatives, agricultural industry representatives, state and city government representatives, social service providers, as well as environmental and labor justice activists. In addition to Fresno, interviews were conducted in several rural communities including Huron, Mendota, Firebaugh, Five Points, Exeter, Coalinga, Cantua Creek, and Hanford.

In addition to semi-structured interviews, I conducted participant observation by volunteering in the distribution of food aid in the farmworking communities of Huron, Mendota, and Firebaugh and conducting visits to different farms in the SJV. Participant observation in social research allows for the researcher to access new sources of data, reduces the problem of reactivity by people to the researcher, allows for development of culturally appropriate questions, creates an intuitive understanding of culture at a site, and opens up new understandings of social institutions and organizations (Bernard, 2011). I also attended a community meeting in Cantua Creek organized by the State of California to discuss options to address dramatic water price increase for residents of Cantua Creek.

Most of the interviews were recorded with permission of the research participant; if the interview was not recorded notes on the interview were written up at the conclusion of the interview. Both the transcripts of interviews and interview notes were analyzed using MAXQDA software to code in-vivo for narratives of drought impacts, vulnerability, and recommended drought responses.

Drought Impacts

The following drought impacts were reported through interviews and participant observation:

- Domestic wells going dry – particularly for the east side of the San Joaquin Valley.
- Water price hikes for small water systems –small communities dependent on surface water for domestic water use face dramatic increases in domestic water bills as water prices surged from \$300/acre-foot to \$1300/acre-foot
- Increased water contamination – heavier pumping of groundwater during drought increasing the concentration of pollutants from pesticides and fertilizers in groundwater

- Impact on farm jobs – fewer hours available than previous years, shorter harvesting season, traveling farther for jobs, closing down of fruit packing plants and food processing plants. While many research participants cited decrease in jobs and hours available, some of the interviewed farmworkers stated that there was plenty of work available.
- Greater need for assistance in paying heat, water, and food bills
- Increase in asthma and health problems associated with more dust in the air as less water available for watering down dusty fields and dirt roads

Environmental Narratives of Drought Vulnerability

Four main narratives of drought vulnerability emerged from interviews and informal conversations during participant observation activities. These four different narratives frame how drought impacts are identified and prescribe different policy solutions for increasing drought resiliency in the region. The cast of characters varies between the narratives, involving different heroes and victims whose ability to respond and adapt to drought conditions are threatened by different villains.

Table 1. Drought Vulnerability Narratives in San Joaquin Valley

Narrative	Hero	Villain	Victim	Policy Solution
Agricultural Exceptionalism	California Agriculture	Urban residents who don't care where their food comes from, government regulation and lack of investment in water storage	Farmers, farmworkers	Increase water storage
Fish over Food		Environmentalists, environmental regulations,	Central Valley farmers and rural communities	Modify or abolish Endangered Species Act
Appalachia of the West/Modern Dust Bowl		Poverty, lack of government investment	Rural communities	Promote regional economic investment and diversification
Plantation Model Agriculture		Conventional Farming Systems	Farmworkers	Increase wages, increase farmworker access to land

The narratives presented to me in my research are not rigid discourses that necessarily fit neatly into a table and individual interviews with study participants did not necessarily align into four neat narratives. They are presented here as such to aid analysis of drought narratives, but these narratives are best thought as points along a continuum that are constantly evolving, changing and affecting each other (Adger, 2001).

1) *Agricultural exceptionalism:*

In this narrative, California agriculture is cast as the hero of the narrative. Thanks to the investment by farmers and the state and federal government, the building of dams and canals has allowed for the flourishing of an agricultural system that is unmatched

worldwide. California agriculture is a magical combination of soil quality, temperatures, and climate that only requires the addition of water to flourish. As one participant described: *“for those of us who have been involved in agriculture, and have been able to see and talk to people from around the world for decades, this is such a special place. This is incredibly special to have over 400 different kind of commodities.”*

As these unique conditions existing in California are so rare, the narrative implies there is a moral calling to grow food and provide the backbone of the nation’s food security. One participant points out *“...how important is the domestic food supply? What are we able to do here in California that we are not able to do anywhere else in the United States and many places of the world?”* Several participants explained that without California’s agriculture, the country would have to import “less safe” food from other countries.

In this narrative the lack of investment in more water storage facilities like dams and canals is due to both environmental restrictions and lack of interest by government and urban residents in supporting domestic agriculture. As there has been a lack of investment in water storage and distribution of surface water, agriculture is now more vulnerable during drought and must rely on unsustainable and expensive groundwater. The narrative calls for renewed investment in water storage facilities in order to support California agriculture and prepare for future droughts.

2) Fish over Food

The Fish over Food narrative casts the drought and drought vulnerability as a direct result of environmental regulations and the Endangered Species Act that have decreased the amount of surface water delivered through the Central Valley Project and the State Water Project in order to protect the habitat of endangered fish – specifically the delta smelt and winter run salmon. The villains in this narrative are the environmentalists who would prefer to see fish species survive over food production, agricultural jobs and livelihoods of the SJV. Some proponents of this narrative cast this as a product of racism and argue that environmentalists are discriminating against the predominantly Latino communities of the Central Valley.

This narrative is deeply entrenched through the valley, casting the drought as a regulatory event and not as a climactic one. As one participant describes when being asked about the drought - *“the drought started in 2008 when the courts ruled in favor of the fish.”* Other study participants did distinguish between the climactic drought and the regulatory one, blaming the regulatory drought for affecting the valley’s ability to cope with the effects of the climatic drought: *“What aspect of the drought do you want to address? The natural one or the congressional one?... The environmentalists have such a stronghold over everything to do with state, the politics, water rights... and that has intensified the natural drought.”*

In the fish over food narrative, the ensuing policy prescription to aid those who depend on agricultural livelihoods during drought is to abolish or modify the Endangered Species Act in order to allow for more water transfers to farmers in the Central Valley. Many participants argued that the fish are being subjected to so many other stressors such as

invasive species and global warming, that it is futile to attempt to conserve a dying species and that *“No one wants to watch the salmon die off, but we are watching communities die off.”*

3) *Appalachia of the West or Modern Dust Bowl*

The Appalachia of the West narrative was less prominent in my interviews, but it did emerge as a storyline that explains drought impacts as a result of endemic poverty in the region. For several participants, this narrative emerges with connections to the Dust Bowl of the 1930s, when many families fled the prairies and settled into the Central Valley. Matt Black, Central Valley photographer, directly connects his photographic coverage of the drought with the Dust Bowl by taking black and white gritty pictures that are reminiscent of Dorothea Lange’s pictures of the Great Depression and the Dust Bowl. Alongside the connections with the Dust Bowl, this narrative also compares SJV with the poverty of the Appalachia, where over-reliance on an extractive economy and lack of economic investment and government support fosters deep poverty. One participant cited a Congressional Research Service report that compares socioeconomic indicators for the Central Valley to those of the Appalachia region:

... the Congressional Research Service, CRS, they put out a report in 2007 that was just focused on the San Joaquin Valley. Two hundred plus places just talked about comparing this valley to the Appalachia, the Appalachia region, saying that there are many indicators that we are worse off in terms of... any number of indicators... So I think Washington doesn’t get it in the sense that the emergency that is already happening with the drought and they don’t get it when it comes down to helping diversify the economy, because we are in an extractive economics.

The implied policy in this narrative is to decrease drought vulnerability of the region by investing in rural communities and diversifying the economy away from a reliance on agriculture.

4) *Plantation Model Agriculture*

A counter-narrative to narratives of California Agricultural Exceptionalism and Fish over Food identifies drought vulnerability as a product of an agricultural system that relies on the exploitation of a vulnerable class of farmworkers. This Plantation Model Agriculture identifies the villain as a farming system where farmworkers work for low wages and face food and water insecurity. The narrative points out that whether there was a drought or not, the poverty level and food and water insecurity would still be pervasive across rural communities.

Several participants recommended the book *The King of California* that describes how several large-scale farmers migrated to the Central Valley from the American South and started large cotton farms that employed some of the same farming models as southern plantations. One participant indicated, *“These people are making survival wages, that all there is... There is an incredible disparity here that is very disturbing to me... It is the South. They are tenants, no they just are servants. The disparity is very disturbing.”*

Proponents of this narrative were concerned that the discourses around the plight of farmworkers and rural communities during the drought were supporting actions such as increased surface water transfers that would aid farm owners and not address problems faced by farmworkers. One participant argued:

But a lot of the conditions that people are facing - like not being able to drink their water, or paying too much of their salary for water, having little to eat, all of those things... communities have been struggling with those things for decades. It is not... it is almost like ironic, and ultimately we have seen how, a lot of the AG interests have done a good job - I call it hijacking - hijacking the community face... of hardworking immigrant that wants to feed their family and no water, no jobs.

The prescribed policy for addressing drought vulnerability is to raise farmworker wages and improve living conditions in rural communities. Some participants also recommended starting farming cooperatives and other farming models that would allow farmworkers to have a greater share in the region's agricultural profits.

Differences and Commonalities in Narratives

Mapping and identifying drought narratives are important because it gives insight into local knowledge and explanations of environmental events, identifies reasons as to why specific drought actions and policy prescriptions are favored, and also provides an opening into future agricultural possibilities (Harris, 2009). As Lejano, Ingram, and Ingram point out "science and technical work do not suffice to settle a debate. In this context of fundamental and often irresolvable uncertainty, the construction of new and integrative narratives can provide direction to a society in search of answers" (Lejano, Ingram, and Ingram, 2013). Analyzing drought narratives in the Central Valley and identifying commonalities and resonances between them, allows for the construction of new drought narratives that can hopefully bridge many of the divides between different local stakeholders and prepare the region for future droughts.

While the identified four narratives have different heroes and victims, all four narratives acknowledge the importance of agriculture for the livelihoods of rural communities. One social activist pointed argued "*I'm not saying AG go away, because that means my people have nothing to do, and not just immigrants but also first generation families that are not going to have skills that they have had for decades now - where are they going to transfer that to?*" Another farmer indicated that you see the impacts of the drought in the disadvantaged rural communities and that when "*you get down into these communities and the impacts of what is happening to those individuals in those smaller disadvantaged communities - I just think that we almost have a sacred obligation to try to efficiently farm as best as we can.*" While these two participants presented very different narratives of drought vulnerability – both agree that investing in agriculture and rural communities is the way to reduce drought vulnerability.

Outcomes

The CLIMAS Fellowship allowed me to conduct research into the how different stakeholders in the San Joaquin Valley food system identify drought impacts and how

stakeholders narrate the production of vulnerability by linking between social and physical factors such as water infrastructure, environmental regulations, and agricultural history.

This research on drought impacts and drought vulnerability was also presented at the “Resilience Summit: Disaster by Drought” organized by Cal Poly San Luis Obispo and the United Nations University. Through my involvement in the summit, lessons from this research have been included in a policy brief on the drought for the National Security Council at the White House.

Lessons from Use-inspired research

When beginning my research on drought vulnerability I initially intended to focus my research on drought and food security, focusing on food insecurity of farmworkers and responses by local food banks to drought impacts. However, as I conducted my research I encountered many contradictory narratives on the drought. Some farmworkers told me they had less work and needed more assistance while other farmworkers told me there was plenty of work available. Some rural residents were deeply concerned over the drought while others were dismissive of its impacts on the community. These contradictory answers guided me to focus on environmental narratives and different framings of the drought. These contradictory answers are also reflective of one of the challenges of conducting use-inspired research – there is no one-stakeholder viewpoint. As droughts are both a physical and a social event, droughts are embedded within a complex landscape of competing values and priorities and can quickly become politically and culturally controversial. I used environmental narratives research method to explore these controversies as it does not privilege one narrative over another (Harris, 2009) and allows for identifying the viewpoints and priorities of different stakeholders.

Next Steps

The next steps in my research include:

- Conducting a narrative analysis of the national media coverage of the drought as well as major drought policy documents to compare local narratives and local drought knowledge to national and policy discourses on drought vulnerability
- Continue conducting research in the San Joaquin Valley on drought vulnerability and how the California drought can inform climate change adaptation efforts.

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