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Community Perspectives and Environmental Justice in California's San Joaquin Valley

Humberto Flores-Landeros,ⁱ Chantelise Pells, Miriam S. Campos-Martinez, Angel Santiago Fernandez-Bou,ⁱⁱ Jose Pablo Ortiz-Partida,ⁱⁱⁱ and Josué Medellín-Azuara

ABSTRACT

There is a surge of interest in reaching social and environmental justice in California's disadvantaged communities by governments, nongovernmental organizations, and academia. However, actions taken so far are insufficient to reduce those inequities substantially. We propose the lack of effective policies and relevant scientific work results in part from research that does not consider the communities' perspectives. The struggles that disadvantaged communities face are broadly understood. Yet, few efforts have been made to communicate directly with these communities to learn about their concerns, priorities, and nuances of their struggles. This article looks to bridge the gap between rural disadvantaged communities' members and the policies and institutions meant to benefit them. Through our findings, we intend to demonstrate the importance of first person stakeholder input to humanize environmental research and to assist in directing funding that addresses the needs and priorities determined by the communities. In this study, we present the results of 22 interviews of community members and representatives from 12 communities in California's San Joaquin Valley. The interviews spanned environmental and socioeconomic inequities that disproportionately affect these communities. Among environmental inequities is the reliable access to an acceptable quantity and quality of water, impacts from hydroclimatic hazards (e.g., flood and droughts), and poor air quality. Socioeconomic inequities included insufficient access to food, limited employment opportunities, and disproportionate political representation. Many of these inequities co-occur and significantly impact the day-to-day quality of life of community members. Although communities share similar challenges, many of the identified issues were locally specific, and broad-brush policies could easily overlook them. Learning from the communities' thoughts and opinions, we gained valuable insight into key issues that may lead to policies and scientific research directly benefiting rural San Joaquin Valley disadvantaged communities. In addition, our research contributes to much-needed stakeholder input focused on co-occurring environmental impacts.

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INTRODUCTION

SINCE THE 1900s, the San Joaquin Valley of California has been nurtured for agricultural developments. Supported by massive land grants after the forced removal and genocide of the Yokuts and Miwuk peoples who first occupied the valley, agriculture expanded rapidly.¹ In 1912, within the California Colonization Project, the Fairmead Farms advertised “abundant and cheap water supply and a deep rich sandy loam soil.”² Drawn by the promise of plentiful resources and opportunity, African Americans attempting to escape the oppressive Jim Crow South were among the first to settle the valley.³ Excluded from urban areas through racially restrictive housing, intimidation, and violence, communities of color established settlement types in the form of colonies and unincorporated towns with little government involvement in planning and investment. Farmworkers and low-income families created these communities through determination despite their hardships of surviving.⁴ Structural racism and alienation erased the histories of Native Americans, African Americans, and immigrants from Mexico, the Philippines, India, Pakistan, and Yemen.⁵ This lack of acknowledgment has laid the framework for a legacy of marginalization in these communities. These economically depressed areas originally populated

by black Americans constitute among the first disadvantaged communities in the San Joaquin Valley that are now more densely populated by Latinos.⁶

The California Environmental Protection Agency defines disadvantaged communities of California as census tracts that perform in the 75th percentile or higher (worse) of a score called “CalEnviroScreen” that measures geographic, socioeconomic, public health, and environmental hazard criteria.⁷ The San Joaquin Valley has the highest concentration of disadvantaged communities in California, with 413 census tracts classified as disadvantaged containing 55% of its population.⁸ It also contains 7 of the top 10 agricultural counties in California,⁹ yet has the lowest food security rate.¹⁰ Disadvantaged community members in the San Joaquin Valley are predominantly Latinos, many of which are farmworkers who traditionally have fewer rights.¹¹ These disadvantaged communities experience disparities in poor drinking water quality,¹² such as increased levels in nitrogen,¹³ which has shown a correlation with thyroid cancer incidence.¹⁴ Socioeconomic factors and housing conditions have shown to exacerbate other health disparities such as that of COVID-19, which disproportionately affected

¹Kimberly Johnston-Dodds and John L. Burton. *Early California Laws and Policies Related to California Indians*, CRB, CRB 02-014 (Sacramento, CA: California State Library, California Research Bureau, 2002), <<https://www.loc.gov/item/2003373506>>; Madley, Benjamin. *An American Genocide: The United States and the California Indian Catastrophe, 1846–1873*. Illustrated edition. New Haven: Yale University Press, 2016. Available at: <https://yalebooks.yale.edu/book/9780300181364/american-genocide>. (Last accessed on June 10, 2021).

²Michael Eissinger. *Re-Collecting the Past. Rural Historically African American Settlements in the San Joaquin Valley* (Merced, CA: CreateSpace Independent Publishing Platform, 2017).

³Eissinger. *Re-Collecting the Past. Rural Historically African American Settlements in the San Joaquin Valley*.

⁴Anne Bellows. *Lanare, California: A Brief Narrative History*. (UC Berkeley: Thelton E. Henderson Center for Social Justice, 2013).

⁵Jonathan K. London, Amanda Fenci, Sara Watterson, Jennifer Jarin, Alfonso Aranda, Aaron King, Camille Pannu, Phoebe Seaton, Laurel Fireston, Mia Dawson, and Peter Nguyen. The Struggle for Water Justice. *UC Davis Center for Regional Change*, 7 February, 2018, <<https://regionalchange.ucdavis.edu/report/the-struggle-for-water-justice>>; Eissinger, *Re-Collecting the Past. Rural Historically African American Settlements in the San Joaquin Valley*.

⁶The authors use the term *Latino* in a gender-inclusive way.

⁷OEHHA. *CalEnviroScreen 3.0: Update to the California Communities Environmental Health and Screening Tool*. (Office of Environmental Health Hazard Assessment, 2017). <<https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30>>. (Last accessed on October 3, 2020).

⁸OEHHA.

⁹CDFR. *Agricultural Statistics Review*. (Sacramento: State of California, 2019), <<http://www.cdfa.ca.gov/Statistics/PDFs/AgExports2018-2019.pdf>>. (Last accessed on January 4, 2021).

¹⁰Laura-Anne Minkoff-Zern. Hunger amidst Plenty: Farmworker Food Insecurity and Coping Strategies in California. *Local Environment* 19 (2014): 204–219.

¹¹“Bill Text—AB-1066 Agricultural Workers: Wages, Hours, and Working Conditions. <https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160AB1066>. (Last accessed on April 15, 2021); Bill Text—SB-535 California Global Warming Solutions Act of 2006: Greenhouse Gas Reduction Fund. <https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201120120SB535>. (Last accessed on April 15, 2021).

¹²Carolina L. Balazs and Isha Ray. The Drinking Water Disparities Framework: On the Origins and Persistence of Inequities in Exposure. *American Journal of Public Health* 104 (2014): 603–611.

¹³Carolina L. Balazs, et al. Social Disparities in Nitrate-Contaminated Drinking Water in California’s San Joaquin Valley. *Environmental Health Perspectives* 119 (2011): 1272–1278.

¹⁴Arianna Q. Tariqi and Colleen C. Naughton. Water, Health, and Environmental Justice in California: Geospatial Analysis of Nitrate Contamination and Thyroid Cancer. *Environmental Engineering Science* 38 (2021): 377–388.

farmworkers who live in these communities.¹⁵ The environmental justice problems that exist in the Central Valley have prompted various studies, including the water marginalization that exist at the urban fringe,¹⁶ the extremely low air quality and its relationship with social construction theory,¹⁷ and how race is correlated with local pesticide pollution (e.g., Hispanic populations and increased local chlorpyrifos concentrations).¹⁸ Although environmental injustice has dramatic effects in the Central Valley, often grassroots activists do not self-identify with the environmental justice movement,¹⁹ likely due to the lack of information exchange between frontline communities and researchers, policymakers, news media, and the rest of society.²⁰ In addition, many communities lack political leverage due to their unincorporated status and by being outnumbered in political arenas.²¹ To reach effective policy solutions in California, policymakers, media, and scientists would benefit from a first-hand improved understanding of disadvantaged community issues.²²

Although the San Joaquin Valley has the greatest number of disadvantaged communities in the state, few studies have directly involved communities' perspectives in the research process.²³ Integrating community per-

spectives in environmental justice research is a critical first step in policy planning and funding programs because it can more accurately account for the realities on the ground (ground-truthing²⁴). Although the commitment of state agencies to determine which communities are in need, the screening tools (CalEnviroScreen) do not capture the multiple locally specific factors that environmental justice communities encounter daily. Ground-truthing approaches based on community input can be extrapolated to inform research and policymaking.

In this study, we interviewed stakeholders from disadvantaged communities in the San Joaquin Valley to understand first-person representations of inherent structural inequities. We asked open interview questions to stakeholders from disadvantaged communities and experts from nonprofit organizations working with the communities, community activists, city council members, water system managers, civil rights activists, and other allies in Fresno, Tulare, and Kern counties about environmental and socioeconomic topics. Then, we discuss the implications of their responses and the importance of dialogue on understanding disadvantaged communities' needs. The purpose of this study is to identify such needs and create a more human-centered approach by providing a platform for San Joaquin Valley environmental justice communities to tell their story in their own words about the issues that matter most.

METHODS

We utilized a snowball sampling approach to recruit interview participants by attending conferences related to community issues and building our network through personal recommendation. Our interview protocol was designed to collect broad perceptions of the presented environmental and socioeconomic issues. We asked interviewees to speak as representatives of the community to account for interviewees who live or at one point lived in a disadvantaged community and those who work with them but have not necessarily lived in the communities. The interview questions shown in Table 1 were created to address community concerns and priorities and respond to literature gaps. They were informed based on preliminary information from the stakeholders and a review of the relevant literature.

The audio of the interviews was transcribed using Sonix.ai, an online transcription service. The research team scrubbed each transcript to remove transcription errors and removed personal identifiers for each interviewee. The resulting transcripts were used in the interviews' qualitative analysis using NVivo 12 Plus software (QSR International). Each transcript was formatted with a heading style based on the corresponding question number (Table 1), which allowed for the use of NVivo 12 Plus's autocoding by heading style function. The output of this autocoding resulted in 10 separate folders named after each interview question, which contained the corresponding responses for all 22 interviewees. Finally, the team performed further manual coding at the sentence level to collect responses to emerging topics that

¹⁵Edward Kissam. The Impact of the COVID-19 Pandemic on California Farmworkers: Better Local Data Collection and Reporting Will Improve Strategic Response. *Statistical Journal of the IAOS* 36 (2020): 867–898.

¹⁶Malini Ranganathan and Carolina L. Balazs. Water Marginalization at the Urban Fringe: Environmental Justice and Urban Political Ecology across the North–South Divide. *Urban Geography* 36 (2015): 403–423.

¹⁷Sumaia A. Al-Kohlani and Heather E. Campbell. Rank-Order Implications of Social Construction Theory: Does Air Quality Depend on Social Constructions? *Policy Sciences* 49 (2016): 467–488.

¹⁸Daniel J. Hicks. Census Demographics and Chlorpyrifos Use in California's Central Valley, 2011–15: A Distributional Environmental Justice Analysis. *International Journal of Environmental Research and Public Health* 17 (2020): 2593.

¹⁹Alison Hope Alkon, Marisol Cortez, and Julie Sze. What Is in a Name? Language, Framing and Environmental Justice Activism in California's Central Valley. *Local Environment* 18 (2013): 1167–1183.

²⁰Jonathan London, Mary Louise Frampton, Robin DeLugan, et al. Growing Community-University Research Partnerships in the San Joaquin Valley. research-article. <<https://home.liebertpub.com/env>>. (April 17, 2013). DOI: 10.1089/env.2012.0036; Carolina L. Balazs and Rachel Morello-Frosch. The Three Rs: How Community-Based Participatory Research Strengthens the Rigor, Relevance, and Reach of Science. *Environmental Justice* 6 (2013): 9–16.

²¹Michelle Wilde Anderson. Cities inside Out: Race, Poverty, and Exclusion at the Urban Fringe. *UCLA Law Review* 55 (2008 2007): 1095.

²²Angel Santiago Fernandez-Bou, et al. *Underrepresented, Underserved, Understudied: Gaps and Opportunities for Advancing Environmental Justice in Disadvantaged Communities*. 2020. [Epub ahead of print]; DOI: 10.13140/RG.2.2.19 036.41606.

²³Fernandez-Bou, et al. *Underrepresented, Underserved, Understudied*.

²⁴James Sadd, et al. The Truth, the Whole Truth, and Nothing but the Ground-Truth: Methods to Advance Environmental Justice and Researcher–Community Partnerships. *Health Education & Behavior* 41 (2014): 281–290.

TABLE 1. LIST OF THE INTERVIEW QUESTIONS

No.	Question
1	What is your relationship with this community?
2	Do you identify any “Environmental risk” for the livelihood of your community?
3	[<i>If not addressed in the previous question</i>] Does your community have access to clean water? [<i>Meaning if they can drink, bathe, or cook with water from the tap</i>]
4	[<i>If not addressed previously</i>] What are the major challenges that the drought brought to your community that you did not expect?
5	What are your thoughts about climate change and the potential effects on your community?
6	Can you speak about food access and security in your community?
7	What limitations does your community have compared with other places that you know?
8	How is the employment in your community?
9	Do you think the community is represented at the different levels of government?
10	Is there anything you want to add?

appeared throughout the interview process. We analyzed the subtopics frequency (Fig. 1), counting the number of interviewees that mentioned each of them. We also aggregated interviewee responses from the qualitative analysis on environmental (Table 2) and socioeconomic issues (Table 3).

RESULTS

The interviews lasted between 20 and 90 minutes with an average of 50 minutes. The stakeholders addressed topics that included inequalities and challenges regarding air, water, infrastructure, education, food access, and other emerging issues (e.g., extreme heat, racism, and lack of political representation). Subtopics included specifics; for example, the water challenges topic was subdivided into flooding, water quantity, quality, and dependability in bottled water.

Tap water is unsafe to drink; bottled water is unaffordable

*We buy \$100 of [bottled] water almost every week.
—Community member, Matheny*

Water quality was one of the leading environmental concerns raised by the interviewees. Groundwater was mentioned as the primary water source and often described as unappealing in appearance and flavor. Although the residents’ mentioned aesthetic and flavor issues were easily detectable, more concerning to them was the less evident toxic chemicals potentially present in the drinking water. Community members expressed distrust due to the miscommunication and insufficient information about these more elusive chemicals. A labor leader in Parlier demonstrated concern for the maximum contaminant level (standards set by the U.S. Environmental Protection Agency) as they believed the studies to set these limits did not account for vulnerable populations. A topic of concern for them was that these contaminants’ presence and their impact are not adequately communicated and comprehensively presented to the people through the maximum contaminant level violations. These shortcomings were believed to be significant contributors to community

members unknowingly consuming contaminated water and believing that these contaminants could be removed through filtering or boiling. Seventeen of the 18 interviewees mentioned bottled water as the primary source of safe drinking water.

Communities are severely underserved and do not have basic infrastructure or opportunities

The infrastructure or lack thereof was mentioned as one of the main reasons for their poor water quality. The lack of sewerage and drainage infrastructure was said to contribute to the overflow of septic tanks that would pollute their domestic wells. Several communities mentioned that this lack of basic infrastructure such as sidewalks or asphalt on the roads made small rainfall events translate into flooding episodes. They also mentioned the flooding as a significant issue for children who walked to school and spent the entire day with wet socks, making it difficult for them to concentrate and learn.

Geographic vulnerability and poor industrial practices also play a role in flood risk. Lamont stakeholders (southeast of Bakersfield) attributed their flood risk to the various levees set up by farmers to protect their crops, which divert the flow into their community. An interviewee shared their discontent by expressing, “*clearly, crops are more important than people in this area.*”

Infrastructure is a clear disadvantage observed by the lack of public work investments such as paved roads, sidewalks, public lighting, and green spaces. Having no hospital, clinics, and pharmacies in proximity were seen by community members as a threat to their livelihood.

Healthier food options are less accessible

*We feed a large portion of the nation, yet there is no affordable fruits or vegetables in the communities
—Nonprofit member, Lamont*

Interviewees mentioned that transportation and affordability influenced the food accessibility, affordability, and security of their community. The lack of grocery stores was the primary hurdle to food access and security,

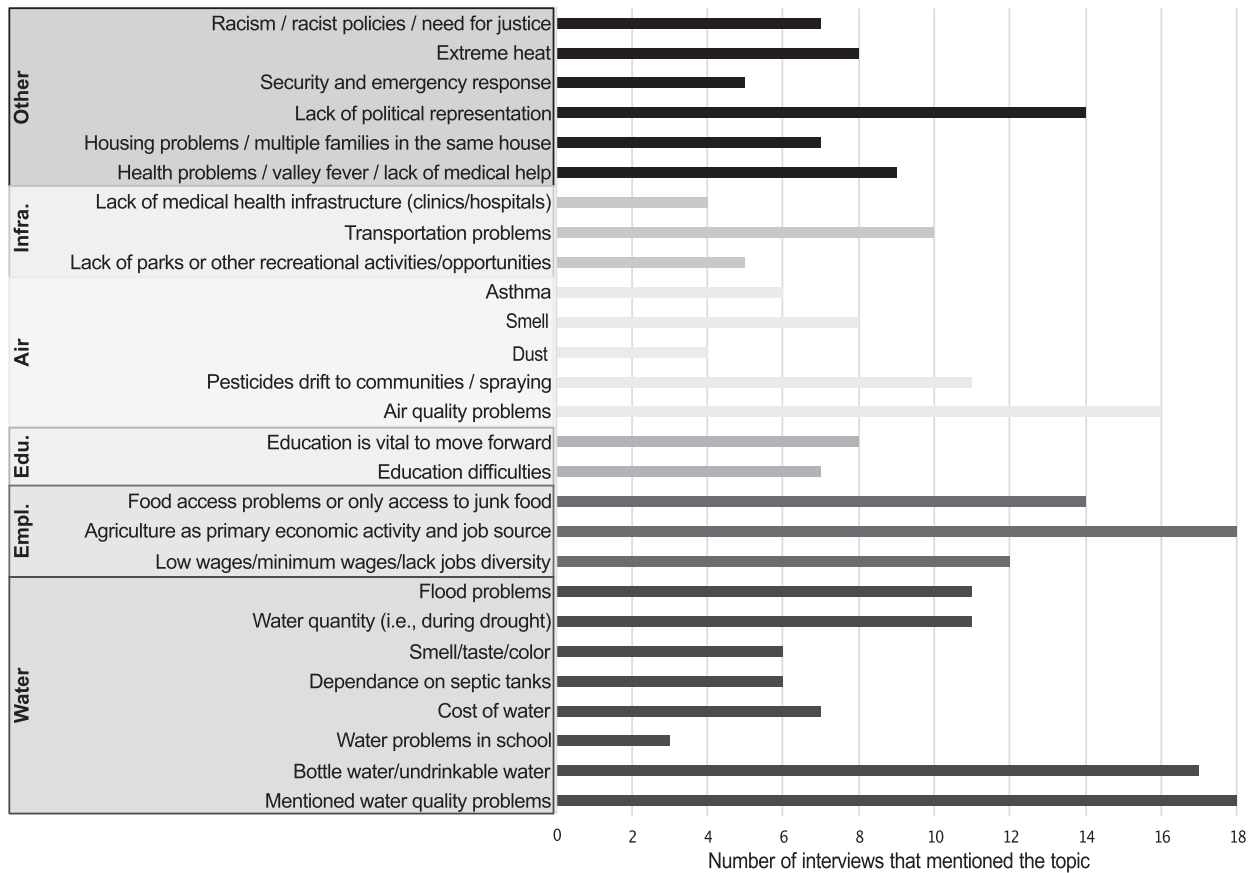


FIG. 1. Topics frequently mentioned by the interviewees: The vertical axis shows the most frequently mentioned phrases and words, color-coded by their main topics. The horizontal axis represents the number of interviews in which each item in the vertical axis was mentioned. Water quality problems and the economic impact of agriculture were the most mentioned, covering all the interviews ($n=18$), followed by bottled water, air quality issues, and the accessibility to healthy food and environmental issues.

requiring people to seek options out of town. Alternatively, many stakeholders reported that they must purchase their food in convenience stores at much higher prices and lower quality, leading them to have unbalanced diets.

Poor air quality is a significant burden

Despite severe food disparities and water issues, many stakeholders mentioned air quality as the most threatening issue, even above water quality issues (Fig. 1). One local politician said, “we can buy bottled water, but we cannot buy clean air.” Poor air quality was seen as a norm in many disadvantaged communities; as a participant mentioned, “I had to step back and remind myself that it is not normal.” After one of our interviews in west Fresno county, we experienced a dust storm near an elementary school. The suspended dust was so dense that it darkened the sunlight, and required us to reduce our driving speed. According to the school principal, that kind of dust storm occurred very often, and that many students there had asthma, including the principal’s children.

Most of the air pollution point sources identified by the interviewees belonged to the agriculture and petroleum industries. However, participants did not vilify these industries and instead critiqued their practices. The most common criticism was the lack of buffer space between these point sources and the communities. Interviewees mentioned that this lack of buffer space exposed communities significantly to pollution, especially those up-wind from point sources. Some community members showed proof of pesticide drift that covered their parked vehicles several streets away from the agricultural fields.

Agriculture provides the jobs, and the workers pay the cost

Interviewees labeled agriculture as the leading polluter and the principal employer, with employment estimates being as high as 90%. The consensus for jobs in agriculture was that the employees are underpaid. They described the contract rate as “the faster you work, the more you make” and mostly offered during the harvest season along with most of the overtime opportunities. A labor leader from Parlier mentioned agricultural

TABLE 2. A LIST OF INTERVIEWEE RESPONSES ON THE FIVE POSED ENVIRONMENTAL ISSUE QUESTIONS

<i>Environmental issues</i>	
Access to clean water	Aesthetic issues Off-flavors Odd smells Contaminants Pollutants Misconceptions for household treatment Lack of accessible or comprehensive warnings on contaminated water Dependence on bottled water Insufficient income to purchase water No accessible refill stations Aging infrastructure Distrust in water districts
Air quality	Seen as the most threatening issue Dust Pesticide drift Lack of buffer spaces Smog Refinery fires Receiving pollution from large metropolitan areas
Drought	Limited water use Increased water prices Dry wells Increased pollutant levels Financial hardship Little drought relief Overpolicing on drought violations Burden placed on communities rather than large corporations
Floods	Communities built on flood plains Levees diverting flows to communities Lack of flood control infrastructure Damage to housing and community buildings Flooded septic systems Traacherous school commutes for children
Climate change thoughts and perceptions	Majority concerned, some not concerned, and few not familiar Less fog Increased temperatures Extreme heat Prolonged and recurring drought Less rain Less snowpack Lack of discussion from politicians

employees having to deal with the reimplementation of the raitero system. This system profits from driving people to work and charging them even on days they are absent. They addressed work right violations such as employers not providing safe drinking water, clean toilets, or effective shading. They mentioned that when a

violation was reported, the labor commissioner will contact the employer, letting them know the date they will show up, giving the employer enough time to address the issue to avoid an infraction.

Water insecurity is increasing as wells run dry

If you have contaminated water, at the very least, you know, you can flush your toilets, maybe take a shower. But if you don't have any water, you can't do anything. You can't flush your toilet. You can't take a shower in your own house—Visalia nonprofit member

Agriculture was also tied to the drought, and that their high water use and continued expansion of water-demanding crops was expressed as a step back for water conservation efforts. The primary challenges mentioned during the drought were water use limitation, increased water prices, and dry wells. We learned about Okieville, Hardwick, and Seville, whose wells failed during the drought, leaving those communities with no drinking water leading to many community members going into debt or having to move and sell their homes. Interviewees mentioned that emergency funding from the state did become available during the drought, which helped communities such as Hardwick finally solve pre-existing well contamination. In Matheny, residents reported that their water was polluted with arsenic and developed temporary rashes when used for bathing.

Climate change is affecting lives and livelihoods

Most interviewees labeled climate change as a threat for its impact on the drought, employment, and overall safety. Interviewees mentioned noticing less rain, less snowpack, and more extreme temperatures when compared with years past. They also addressed how climate change impacts the seasonality of their work. Climate extremes were of particular concern not just for those who work in the field but also for those whose homes are not equipped with proper heating or cooling technologies. We also heard from those not familiar with the term climate change who did demonstrate a general awareness of the issue through examples or explanations based on their understanding. A member of a nonprofit mentioned that community members who do not believe in climate change would admit to experiencing it in a way and attributed this to being surrounded by a more conservative group. In San Joaquin, a city council member mentioned that they learned about climate change only from outside organizations and claimed politicians do not talk about it.

Local government is not doing enough; community voices are not being heard

In my opinion, it is not the politics at the state level. I think it's the local that's the issue because they are not doing anything, and the ones on top just go by whatever they are told.—City Council Member from San Joaquin

All the participants mentioned not feeling represented adequately by the local government. A nonprofit member from Fresno expressed, “we tend to trust the state of

TABLE 3. A LIST OF INTERVIEWEE RESPONSES ON THE FOUR POSED SOCIOECONOMIC ISSUE QUESTIONS

<i>Socioeconomic issues</i>	
Food	No accessible grocery stores Lack of reliable transportation to grocery stores Healthy foods are too expensive Unhealthy food is readily available Little time to prepare meals Unbalanced diets Local markets selling expired goods
Disadvantages of living in a disadvantaged community	Poor or nonexistent infrastructure No hospitals, clinics, or pharmacies College education opportunities are minimal No K-12 schools built near the communities Ignored for being small communities Additional burdens for being minorities
Advantages of living in a disadvantaged community	Relatively affordable to the rest of the state Sense of community Peaceful living
Employment	Agriculture mentioned as the primary employer; Ag jobs include fieldwork, packinghouses, poultry, and dairy farming Some community members are on fixed income Employees are underpaid Long commutes to work Highly depends on the season and the weather Work right violations Those who cannot drive have to pay a significant amount for transportation
Representation	Unincorporated status affects their representation State government is perceived to have good intentions Local governments representation named as the main challenge Language barriers, limited meeting times, and fear named as significant factors to community involvement Fear of standing against the industry that employs them, their immigration status, or dealing with harassment Feeling neglected and used by local government Government positions held by people with ties to industries Prioritization for wealthy white communities

California more than the local government” and went on to say, “*you have to fight to try to get local officials’ attention.*” Community members often expressed feeling neglected and used by their local government, who they believe take their tax money and invest it in wealthier areas. This feeling of dissociation was expressed in statements such as “*we don’t exist to them,*” “*they only please the bigger voice,*” and “*politicians are thieves.*” San Joaquin was described as “*held hostage by bad leadership*” by a man who has been in power for 20 years representing the Latino population although he is not from Latin America. Some stakeholders reported that his control was “*not due to his great leadership skills but instead to his ownership of most of the city’s businesses.*” Community members mentioned that they often felt more represented by the nonprofit groups that work with them.

Many interviewees believed that politicians ignore them and instead focus on pleasing the larger voice due to their low population density. Nonprofit members also mentioned the prominent role of population density when making more compelling grant applications. Others noted that,

aside from population, race was a significant disadvantage as they noticed inequalities even between low-income minority communities and low-income white communities.

DISCUSSION

This study accounts for co-occurring health impacts and environmental problems, such as poor air quality, lack of infrastructure, and flooding. Recognizing the co-occurrence of issues can help prevent policy efforts that focus on single issues that can exacerbate or create new problems in an attempt to fix others.²⁵ The interview process has allowed for great insight into environmental and socioeconomic injustices in the San Joaquin Valley. Most importantly, we have learned about the people whose existence alone is an act of resilience; as they continue to be underrepresented,

²⁵Julia Mijin Cha, Madeline Wander, and Manuel Pastor. Environmental Justice, Just Transition, and a Low-Carbon Future for California. *Environmental Law Reporter* 50 (2020): 10216.

understudied, and underserved.²⁶ These compounding environmental and socioeconomic factors have excluded these communities from essential decisions that affect them, such as those involving the Sustainable Groundwater Management Act, Human Right to Water, the SAFER Act, and other newly devised legislation, funding, and aid.²⁷

Policy neglecting communities' needs

When we listened to the communities, we learned about the different policy and institutional challenges. We learned that it took a severe drought for a community to obtain the funding necessary to fix their water quality issues. Understanding how the funding only comes available due to disaster relief is another example of how current methods at identifying community needs are ineffective.

Many community members expressed solutions to well-known issues such as pesticide drift²⁸; recommending buffer zones to help reduce the exposure to noise and air pollution caused by pump jacks, improve the lack of green spaces in the communities, and decrease particulate matter, which is shown as a possible link to the incidence of COVID-19.²⁹

Co-occurring factors are essential to finding sustainable solutions

It was also vital to study the environmental and socioeconomic issues together as they are interrelated and create the compounding effects that impact the San Joaquin Valley communities.³⁰ For example, policy decisions such as those regarding air pollution are significant influencers in pollution distribution due to being set in a deceptive degenerative policy system.³¹ Learning that communities do not feel represented in government allows for greater insight into why they suffer from these various environmental injustices.

Ongoing outreach and collaboration

Additional efforts are necessary to ensure that the communities receive the information that will inclusively

benefit them. Rather than simply stating data information such as water contains organic or inorganic pollutants, we can communicate practically and understandably, such as saying that boiling water may increase the pollutant concentration but filtering in a certain way may help. Outreach in English and Spanish such as “Climate Change in the San Joaquin Valley: *A Household and Community Guide to Taking Action*”³² are great examples of publications developed with scientific expertise and based on community wisdom and priorities; this educational guide was also reviewed by the very stakeholders it is meant to serve to ensure language inclusivity and the relevance of the content. This publication was also informed by the same interviews covered in this study. The communities' participation in the review process was facilitated by our research approach of engaging with the communities. The interviewees have become more than research participants; they have become collaborators in the research studies that will impact and benefit them.

CONCLUSIONS

Socio-environmental research would benefit from a more bottom-up approach to understand and adequately address environmental and social inequalities. Engaging with and acknowledging community perspectives is a no-regret first step in reconciling these socioenvironmental disparities. An open dialogue will give researchers insight to communities most pressing concerns while demonstrating that their perspective matters.³³ In this research we have found that beliefs about what is best for communities often differs from reality, thus open communication lines to listen to community priorities, worries, and outlooks becomes imperative. More than disadvantaged, these communities are vulnerable due to historic and increasing environmental and socioeconomic stressors. These vulnerabilities expose the communities' lives livelihood to greater risk as evidenced by the COVID-19 pandemic.³⁴

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We are grateful to all the respondents who donated their time and provided extremely useful insights of the communities they represent. Our semistructured interview protocol was approved by the Institutional Review

²⁶Fernandez-Bou, *et al.* *Underrepresented, Underserved, Understudied*.

²⁷Leigh A. Bernacchi, *et al.* A Glass Half Empty: Limited Voices, Limited Groundwater Security for California. *Science of the Total Environment* 738 (2020): 139529.

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