CSJ Valley Region Program Design

Joshua Kim, Heeseung Sa, Angela Chan, Hugo Sappington, and Theo Wyss-Flamm

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1. Review of CERF's CSJ Valley Region Plan

Valley Community Economic Resilience Fund (CERF) is a 4-county coalition – Fresno, Madera, Tulare, and Kings County – funded by the state of California that works to create a "Regional Economic Recovery and Transition Plan." The plan aims to diversify the local economy and create strategies for growth that are more resilient to economic shocks and increase health and environmental equity. To foster healthy growth, the plan looks to several data sources to portray a better picture of the San Joaquin Valley. In the first part of our paper, we aim to look into the various data systems and sources utilized by the plan and identify weaknesses within the analysis of San Joaquin Valley ("Valley CERF | About" n.d.).

1.1. Summary of Findings

1.2. Data Systems and Data Sources

1.2.1. Identifying Disinvested Communities

Disinvestment is a proportionally significant burden in the CSJV region–62 percent of their census tracts are classified as disinvested, whereas California, on the whole, is considered disinvested in 29 percent of census tracts.[1]

Tools:

To identify and analyze these disinvested tracts, the CERF plan utilized two major data systems, the ACS and CalEnviroScreen. The American Community Survey (ACS) was produced by the US Census Bureau. The ACS was first started in 2005 and accumulates sample cases over 5-year time frames. The data used in this plan was collected during 2017-2021, harvested from 3.5 million households who were contacted and voluntarily chose to complete the survey. Exactly how the plan utilized the ACS is unstated. ACS data appears in its many graphics that articulate the intersection of census tracts with different thematics: race, ethnicity, language, voting age, poverty rates, education attainment, public support program access, cost burdens for housing, commuting habits, and internet & broadband access.

The plan primarily identified disinvested tracts utilizing the data and tools embedded in CalEnviroScreen 4.0. This dataset's focus is on aiding future planning and policy decisions to ensure environmental justice – it " identif[ies] impacted communities by taking into consideration pollution exposure and its effects, as well as health and socioeconomic status, at the census-tract level" (Zeise & Blumenfeld 2021, 8). However, the tool achieves this desired end by overlaying multiple indicators of pollution and population characteristics to administer varying scores.

Criteria and Method:

[1] In this region, calculating disinvestment rates by the number of disinvested census tracts, Tulare is 64 percent, Madera County is 71 percent, Kings County is 52 percent, and Fresno is 62 percent (Valley CERF, BA-9).

Most simply, the CERF analysts defined disinvested tracts as those that were classed "disadvantaged" by the California Environmental Protection Agency (CalEPA)," (Valley CERF 2023, BA-8). The classification of disadvantaged is applied to any census tract that "scored in the 25 percent of CalEnviroScreen 4.0 or 3.0, tracts "at or below 80 percent of the statewide median income," (BA-8), any tract that is classed as "high poverty area" or a "high unemployment area," according to the California Governor's Office of Business and Economic Development California Competes Tax Credit Program, as well as any tracts populated by Federally recognized Native American Tribes. To arrive at their defined tracts, they also performed many data operations. To combine their two primary datasets, the plan makers first " transformed the 2010 census tracts included in CalEnviroM screen to the 2020 tracts […] to […]view most current ACS data (2017-2021 5-year estimates)," (BA-7). Further, they rejected the findings of the California Governor's Office of Business and Economic Development California Competes Tax Credit Program because "it did not support goals to look at within-county differences," (BA-8).

Pros and Cons of the Data Systems Used

CalEnviroScreen	ACS (American Community Survey)
● Much data in CalEnviroScreen is from the ACS thus the same critiques on the right may apply to the left.	● "ACS data are estimates [of >3.5 million voluntary survey responses] and not exact," (BA-7) and further, there might be data gaps and an underrepresentation of survey respondents in the specific region of the CSJV.
● did not include non-federally recognized Tribes, though many of these communities are disadvantaged and the burden to obtain Federal recognition is great.[2]	● "ACS data are especially limited for small geographies and populations," (BA-7)
● identifies neighborhoods ranging from 1000 - 8000 residents. This may be representative of urban populations, rural populations are many times clumped into much larger regions, possibly being misrepresented.	● there is "likely an undercount of immigrant populations", (BA-7)

[2] Citation needed

• was released in October 2021, years after the CERF plan's publication in 2023, the data may be misrepresentative of the moment of analysis	• most census tracts within the region are less populated than average, (where an average might be defined as around 4,000 people […]minimum […] 1,200 people and the maximum is 8,000 (BA-8), and the ACS is "especially limited for small geographies and populations."
• reports have argued this tool has a tendency to underrepresent foreign-born populations. These reports flag a potentially drastic issue because the tool aids in determining state funding and support of the disadvantaged communities it identifies (Lazo 2024).	• Was released in 2021, and the CERF plan was published in 2023, the data may be misrepresentative of the moment of analysis
• Easily accessible user interface with direct access to both GIS / graphical and numerical data	• ACS, as data collected through "voluntary surveys," flags a potential issue in accurate response.
	• Provides data analysis of a broad variety of demographics and themes allowing for much analysis and theorization

Using other tools:

In order to cross check the CalEnviroScreen and ACS combinatory tool, we aspired to evaluate income groups in the CSJV by utilizing the metric which defines the CERF plan's analysis of disinvestment, their 80% rule. Attempting to run the same analysis of census tracts within the CSJV using a different tool proved unsatisfactory and difficult. We tried to evaluate similar criteria as the CERF Plan but within tools other than CalEnviroScreen. We aspired to find an in-browser, easily accessible tool that would have integrated datasets which exceeded the degree of quality we identified in the previous section, however, almost all of the tools we tried utilized the same ACS dataset. Testing the EPA's EJ (Environmental Justice) Screen tool, we were able to select our specific region, but were only fed superficial data analysis, and were paralysed by the inadequate user interface. Running the same analysis of disinvested communities as the CERF plan performed on CalEnviroScreen, the most specific results we could produce were a series of maps and a self-populating infographic. The limitations of these results were that the GIS data was purely graphical, and it provided very limited options for changing graphic representations – thus, numerous racial groups with their accompanied economic statuses were only very superificially able to visualize (Figures 1,2,3). We also tried to perform the analysis within two other leading in browser GIS tools, OnTheMap and HealthyPlaces Index. OnTheMap proved difficult to use,

and impossible to manipulate indicators, only permitting an economic analysis within seemingly arbitrary income blocks. Similarly, HealthPlacesIndex does not permit specification of income blocks. It appears that the classification of "disinvested" was invented by and for the CalEnviroScreen tool, and its results and accuracy are exceedingly hard to replicate or verify.

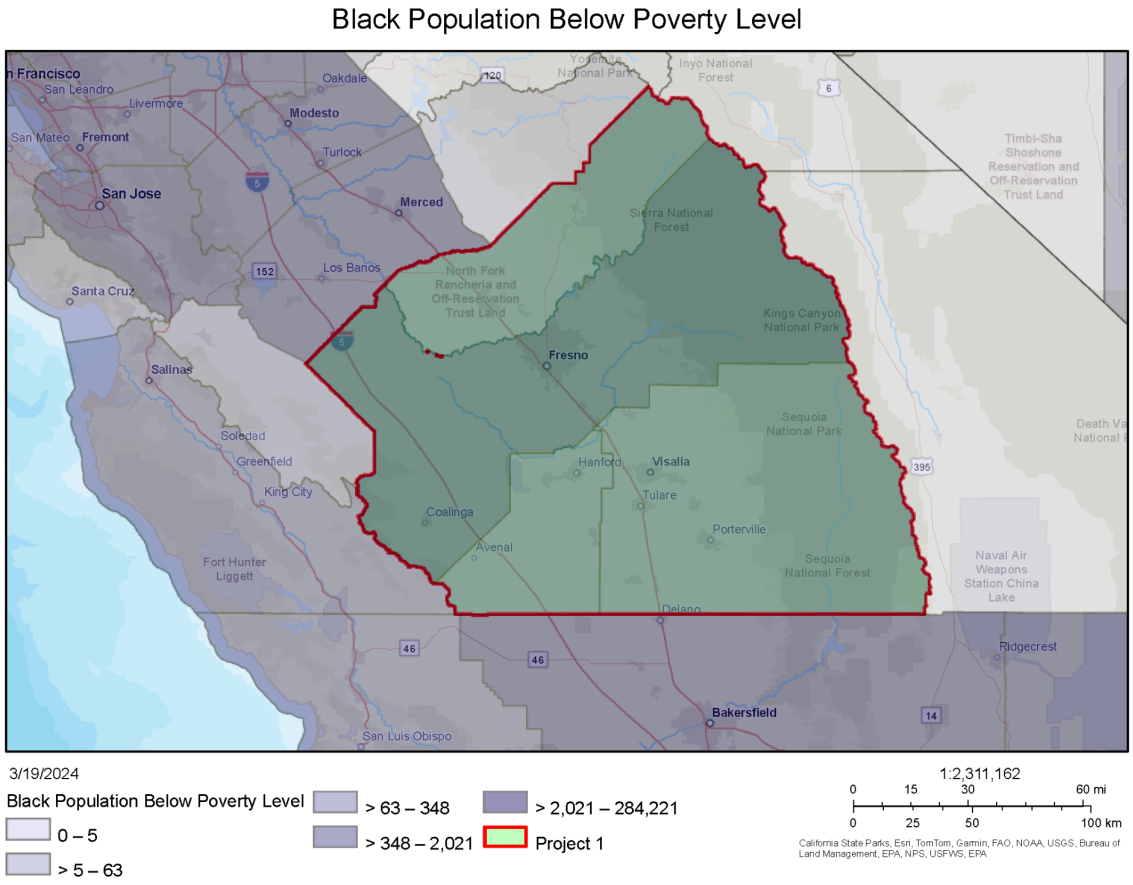


Figure 1. GIS Map Generated Using EJScreen[3]

[3] https://ejscreen.epa.gov/mapper/

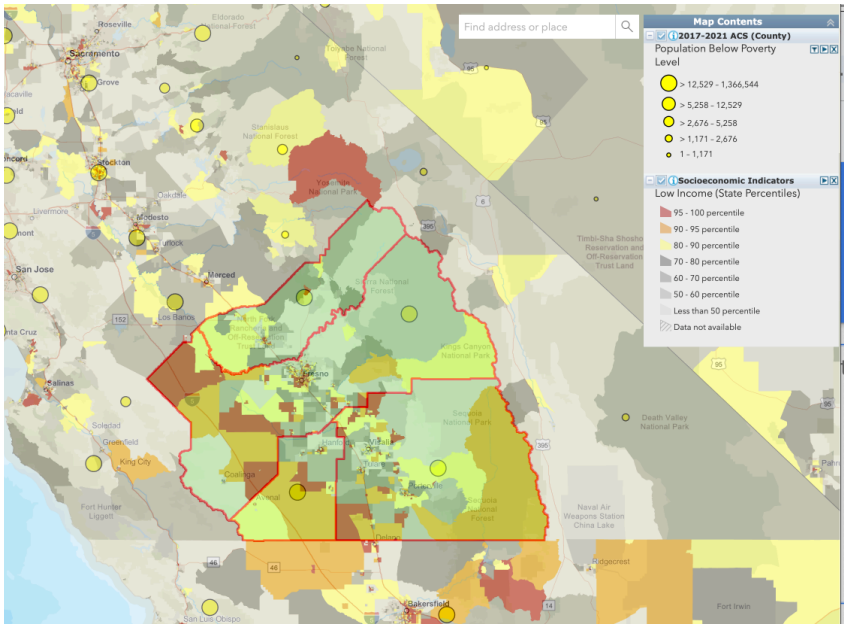


Figure 2. GIS Map Generated Using EJScreen Demonstrating Graphical Inadequacy

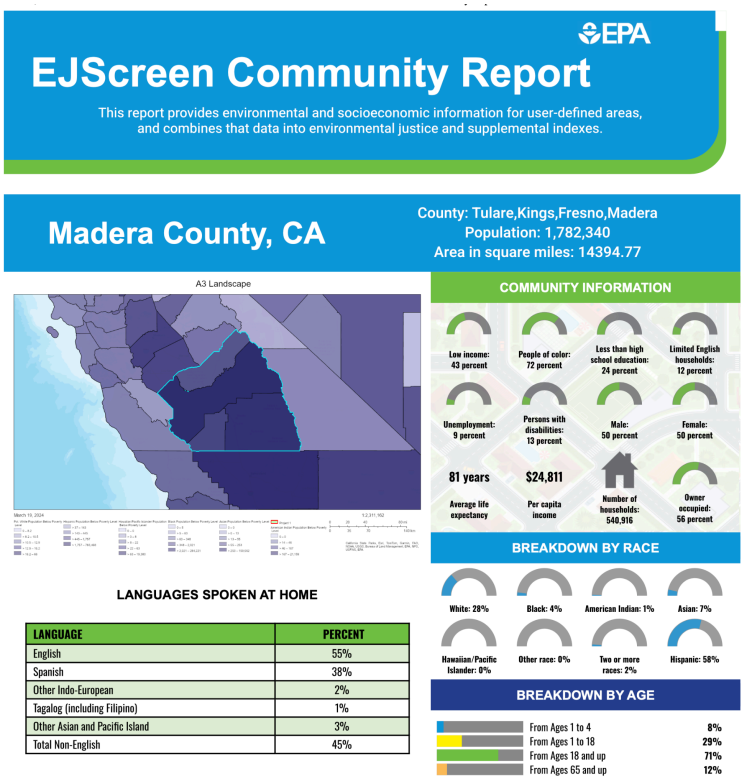
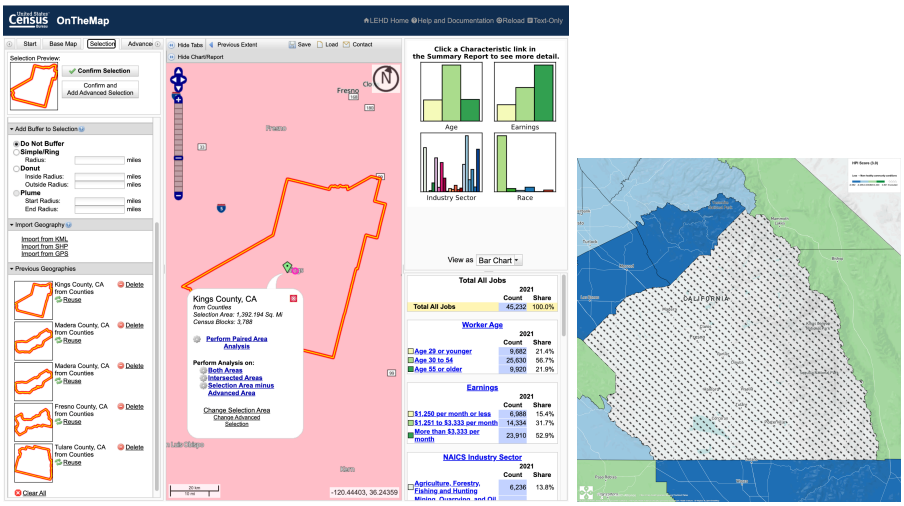


Figure 3. Infographic of Demographics Generated Using EJScreen[4]

[4] https://ejscreen.epa.gov/mapper/



Figures 4 & 5, Map Screenshots of OnTheMap and HealthyPlaces Index Browser Tools

1.2.2. Demographic, Economic, and Public Health Analysis

In the initial baseline assessment of San Joaquin Valley, the CERF plan aims to understand the needs and opportunities in the region to better foster growth. The assessment focuses its analyses on demographics, economic development, and public health, utilizing this data to mark challenges, limitations, and opportunities within the region. We will begin by looking at each of these sections, noting the data sources that were used, the quality and limitations within the data sources, and any additional data systems that the region could benefit from using.

Demographic Analysis:

In the demographic analysis of San Joaquin Valley, the assessment utilizes the ACS dataset to overlay demographic data onto CalEnviroScreen 4.0 data to identify disinvested communities in terms of various thematics. As mentioned in the prior section, the ACS, due to the lack of specific data on the CSJV and a significant portion of data possibly classed misrepresentative of the population, the data quality can be considered low quality.

The second data source utilized for demographic analysis was CalEnviroScreen 4.0. The specific limitations of this dataset are mentioned in the prior section, however, CalEnviroScreen can be considered to maintain a data quality level of medium due to its higher accuracy than the ACS, but latent misrepresentation of rural and foreign-born populations (Lazo 2024).

Additional Data:

Recognizing the primary drawbacks of the two data systems used in the CERF Plan's analysis of disinvested communities, we propose the addition of a dataset with a more accurate representation of immigrant populations: the Policy Institute of California's (PPIC) Immigrants in California dataset from January 2024. The report uses data from the PPIC Statewide Survey of Californians, and better represents immigrants and foreign-born populations in California. While this dataset could provide coverage that the datasets above lack, it could create issues of double counting, and trying to compile these datasets could affect the quality of the overall report if performed imprudently (Mejia et al. 2024).

Economic Analysis:

In its economic analysis, the CERF utilizes multiple datasets depending on whether it looks at cost of living or forward-looking labor market analysis. The two major sources it uses are the 2022 Occupational Employment and Wage Statistics (OEWS) and the Bureau of Labor Statistics (BLS) Employment Projections program (for 2020-2030). OEWS surveying began in 1996 and publication of wage estimates began in 1997 (U.S.BLS n.d.). One problem with OEWS data is reliability: it is a survey by the US Bureau of Labor Statistics and was not mandatory. Further, the OEWS only covers 57% of employment data, meaning that estimates account for more than half the actual population. Finally, since the OEWS survey took three years to complete, the Bureau of Labor Statistics notes that "the OEWS is less useful for measuring changes in job counts or wages over time" (U.S.BLS n.d.). Due to the lack of completeness and reliability of the data, we considered the data quality as medium.

The BLS Employment Projections program was first started in 1960 covering the 1960-1970 period. Since then, it has published projections each year. The employment projections are based on a matrix of multiple program data such as the Current Employment Statistics program (CES), Current Population Survey (CPS), and OEWS. Projections are incomplete because self-employed workers, or workers in the agriculture and private households are under-considered by the program. For specific county data, the Employment Development Department (EDD) of California utilizes the data from the BLS to create state-specific or county-specific datasets, but due to lower coverage, the estimates may be off when the data is applied to more specific counties (U.S.BLS n.d.). Thus, data quality is classified as medium due to the lack of coverage of county-specific data.

Additional Data:

The report could use the Quarterly Census of Employment and Wages (QCEW) from the BLS. This dataset is an improvement from the OEWS as it covers 95% of jobs compared to the 57% of coverage from the OEWS. Since the OEWS excludes all industries in the NAICS 11 (North American Industry Classification System) – agriculture, forestry, fishing, and hunting – the QCEW could be an improvement to the OEWS dataset utilized by the report. However, the QCEW has its issues with the under-coverage of immigrant workers because it uses state employment insurance programs as its primary source of data (QCEW n.d.).

Public Health Analysis:

The public health analysis for San Joaquin Valley uses the 2022 PLACES dataset, 2021 Infectious Diseases report, 2019 Asthma Hospitalization Rate, and 2019-2021 California Health Interview Survey (CHIS). The 2022 PLACES dataset was created by the Centers for Disease Control (CDC) and uses data from the 2019 and 2020 Behavioral Risk Factor Surveillance Survey (BRFSS). This dataset covers the nation and surveys are done throughout, thus it is less accurate when placed in specific county-level regions. Also, the data is 4 years old and could thus be misrepresentative of more recent times (CDC Foundation n.d.). PLACES dataset can be rated low. The 2021 Infectious Diseases report, on the other hand, is a report that provides "case counts and rates of key infectious diseases reported to public health departments in California, overall and by county and gender" (Valley CERF 2023, BA-51). As it covers each county specifically, the data is much more accurate and is well-representative of the population. However, as it only considers those reported to public health departments, there may be issues in coverage with undocumented populations. Overall we considered the data quality as high.

Additional Data:

We propose the addition of the California Healthcare Payments Database (HPD). The HPD is a research database collecting all healthcare administrative data on claims and encounters generated by transactions from both California plans and insurers (McConville et al. 2020). The database aspires to incorporate healthcare transaction data from undocumented workers to create a much more cost-transparent system. However, military, veterans, or people within the prison system are not included in this dataset (HCAI 2023).

1.2.3. Climate Hazard Analysis

Due to the variety of landscape types in the SJV region, it is essential to examine the varying climatic conditions and hazard impacts accordingly. We will assess the data sources and systems that the Valley CERF plan adopts for analyzing flood and extreme heat impacts, referring to accuracy, completeness, timeliness, and reliability, and suggest additional data sources for policymakers.

Climate Hazard Analysis:

The Valley CERF plan indirectly mentions *flood* and *extreme heat*, through the related environmental problems. California Water Board (CWB) is used to research water pollution problems. CWB data is used specifically to inspect animal waste per day in the Valley CERF region, since the SJV region is agriculture-focused so water pollution due to animal waste is a critical issue to address. The data is collected by the State Water Resources Control Board and Regional Water Quality Control Boards. The subset of the datasets is open to the public in the State of California's Open Data Portal, under the 'Water' category; 41 datasets were found under CWB category. The datasets are frequently modified, with the most recent data modified in March 2024. The range of data collection time differs, but most of those 41 datasets were collected from 2019, to 2023 or 2024 (CWB 2024). We consider that the CWB data has *high* quality, considering these aspects: the data is timely with constant data updates; data sets are accurate with 41 different data sets; however not very complete in that the water quality is

examined by too many data sources with little consistency; the data sets are reliable since monitored from the official California government.

The San Joaquin Valley Air Pollution Control District (SJVAPCD) has diverse tools to evaluate air quality of the region. These tools are used to inspect the air pollution problem as well as the Greenhouse Gas Effect, both of which can worsen the extreme heat hazard by trapping the heat in the atmosphere. One of the tools of SJVAPCD is Web-based Archived Air Quality (WAAQ) system, visualizing the air quality or the population exposure of PM 2.5 and Ozone of specific locations, adopting the data from 2002 to 2022 by actual observation. SJVAPCD also provides a Real-Time Air Advisory Network (RAAN) tool, which is an air monitoring system that analyzes air quality data on an hourly basis (SJVAPCD n.d.). The SJVAPCD 2023 report mentions that these air monitoring tools obtain data from the monitoring stations that are managed and operated by the District, California Air Resources Board, and the National Park Service (SJVAPCD 2023). We assess the quality of WAAQ and RAAN tools as *medium*: WAAQ website mentions that an evaluation of accuracy for air quality monitoring models is challenging because they use estimates – not observations – for locations without air quality monitors (SJVAPCD n.d.); while RAAN provides the most timely information, WAAQ data is up to 2022 which indicates less timeliness; the data is not complete in the location without AQ monitors; however, considering the data is collected from different sources, these systems have high reliability.

Additional Data:

We suggest several data sources to examine flood and extreme heat impacts. GHG Emissions Trends Report Data can support the air quality analysis of the region. The data set summarizes and highlights the annual changes of each year's GreenHouse Gas inventory, in different categories. The data source is obtained from California Air Resources Board (CARB), including the data from 2001-2021. We think the data's quality is *high* with better data accuracy, completeness, and reliability than WAAQ and RAAN tools, but with less timeliness, since the data only include information until 2021. Valley CERF plan adopted other data sets from CARB, but not specifically this data set. We suggest using *the raw data set* to analyze the result. In this way, we can view not only the GHG emission divided by industry sector but also more specific information about exactly which part of the industry action causes more GHG emission. For example, the data divides agricultural GHG emission sectors as Livestock Manure Management, Livestock Enteric Fermentation, Crop Growing & Harvesting, and Fuel Combustion (CARB 2019).

Additionally, UCLA Heatmap for ER visits dataset could be useful for extreme heat impact analysis. This data shows the daily excess number of emergency room visits and rate of excess ER visits – number of visits per 10,000 persons per day – due to extreme heat across the state. The data is obtained from California Department of Health Care Access and Information, obtained from 2009-2018 (UCLA Heat Maps). The data quality is *medium to high*, considering that it has great data accuracy and completeness yet less timeliness – not very recent data – and thus low reliability. Unlike in the original Valley CERF plan which did not mention the extreme

heat problem, by adopting this data set, we can assess the direct impact of extreme heat and the exact degree of heat exposure.

Policy Considerations:

When policymakers utilize the data mentioned above, there are several crucial considerations they must keep in mind. As the opportunities, these data show a comprehensive view of environmental hazards, their impacts, and trends over time. The granularity of data, especially with specifics on GHG emissions from various agricultural practices or detailed emergency room visit rates due to extreme heat, can guide targeted policy interventions. For example, understanding specific sources of GHG emissions can help in crafting precise regulatory measures or support initiatives. Similarly, data on ER visits due to heat waves can underline the urgent need for public health preparedness and climate adaptation strategies.

However, there are also concerns regarding data quality, including aspects of timeliness, completeness, and reliability. While some datasets offer real-time or near-real-time data, others may be outdated, which could lead policymakers to make decisions based on conditions that have since evolved. The challenge of data completeness and accuracy is also prominent, as some areas may lack sufficient monitoring infrastructure, leading to gaps in data or estimates that may not fully capture the local conditions. Moreover, reliability issues may arise when data comes from multiple sources with varying collection and reporting standards.

Local knowledge and community input can provide context to the data, revealing how climate hazards are experienced on the ground, which may not be evident through data alone. For instance, while air quality data may indicate pollution levels, it might not reflect the day-to-day experiences of communities facing health issues due to long-term exposure. Similarly, water pollution data might not capture local water usage practices or actual proximity to the water resources of specific communities.

1.3. Community Engagement

1.3.1. Currently Used Engagement Strategies

The current community engagement strategies used by the region included three different reviews of the data, each employing a variety of different engagement techniques. During the initial review, the Valley CERF coalition hosted virtual meetings where participants were encouraged to ask questions and interrogate the baseline and climate data. HRTC stakeholders were provided abundant opportunities to provide feedback in virtual meetings through platforms such as SLIDO and Jamboard to capture reflections in live time. The second round of engagement occurred after the local HRTC meetings were completed, and involved more opportunities for stakeholders to provide feedback, with three optional Q&A sessions, and translations of all materials in English and Spanish. The third round of engagement was a conference for all HRTC stakeholders across the region, where they were shown the final data and asked to analyze the data through a regional lens.

1.3.2. Additional Data Points

Through community engagement practices, the region was able to effectively gain a regional perspective of the data collected through the various data sets. However, through improved community engagement methods, there are several key additional data points that the region could target for collection. To further analyze demographic data in the region, such as mobility patterns and transportation access, CSJV could employ more web-based engagement strategies. Easy-to-use transit apps, in addition to short online surveys, could be very effective to reach large groups of people, identify geographic barriers to access, and better understand the accessibility issues facing their population. To further understand economic indicators such as poverty rates and access to social services, CSJV could organize community meetings in areas of concern, created specifically for public input, outside of the HRTC stakeholders.

A central concern for CSJV relates to climate hazards facing the area, and the subsequent impact on vulnerable populations, or disinvested communities. To learn more about certain land use patterns and their relationship to climate risks, CSJV could integrate participatory mapping and online content-sharing platforms into their engagement plan. These additional community engagement methods will provide opportunities for members of the CSJV population to share their individual experiences of the region and increase the accuracy and nuance of its regional profile at large.

2. Program Design

2.1. Program Goals

Impoverished citizens are more likely to hold their assets in physical items, like money, homes, boats, cars, livestock, etc (SAMHSA, 9). Therefore, this population is more likely to lose assets to climate hazards like flooding and wildfire. The goal of this program is to characterize the impoverished citizens of the CSJV region, identify the location and content of their assets, and improve their property insurance rate to improve the flood resilience of the greater region.

1. Collect financial asset and demographic data on underinsured communities in the Central San Joaquin Valley within floodplains
    a. This will be specifically designed to include the 143,000 undocumented immigrants of the region, making up 8% of the total population. Moreover, this is likely an undercount according to ACS.
2. Understand what limitations exist blocking underinsured communities from protecting their assets
3. Work with the National Flood Insurance Program to create a low-cost flood insurance plan for physical assets

2.2. Developing TOC (Theory of Change)

Theory of Change is a methodology that ensures the successful implementation of programs and policies (Afzalan 2023).

2.2.1. Inputs

- Conduct topographical analysis to identify the extent of floodplains to then define which communities are most vulnerable to inundation
- Coordinate a team of trained community members to collect demographic, asset, and housing data from households within the designated area
    - Accomplished through accessible, dynamic, and rewarding in-person outreach and online surveys
    - Events, materials, and communication will be tailored to the specific context including language preferences, media literacy, and work schedules
- Analysis of the NFIP's Community Rating System program to identify how it could be used in the CSJV context
- Development of a financial and climate literacy program alongside NFIP to ensure that community members are aware of the extreme risk to their physical property while giving them tools to shift their wealth away from physical property
    - This is informed by literature stating that immigrants are more likely to hold their wealth in physical assets that can be more vulnerable
    - This program can be seen as a cost-benefit strategy to save NFIP money in the long term

2.2.2. Outputs

- 38% of the region speaks Spanish at home, but other languages including Tagalog, Arabic, Mandarin, Cantonese, and Vietnamese are also present. So, all communication material will be distributed in English and all other languages as well. Trained outreach surveyors will all have fluency in at least two of the mentioned languages.
- 16% of households in the CSJV's Disinvested areas have no Internet access, therefore, we will be holding ample in-person outreach events like community town halls, workplace info sessions, and door-knocking, while ensuring that we invest at least as much capital and effort into physical outreach materials as online materials.
- Results from online outreach events indicated that "affordable homeowners insurance or canceled homeowners insurance" and "people leaving due to growing cost of insurance" are major issues standing in the way of equity and economic development. In light of this, an affordable NFIP will be created to combat this along with a free financial literacy class.
    - Data will be collected before and after to understand the program's adoption. We hope to get 25% of households on this new plan.
- At least 8% of the CSJV population is undocumented, so we will use a support-first engagement strategy that primarily offers visa and financial assistance before collecting data. We will also have the option for anonymous data submission.

2.2.3. Outcomes

- Gather financial asset and demographic data on 50% of households within communities at risk of flooding in the Central San Joaquin Valley

- Identify 3 limitations preventing underinsured communities from protecting financial assets from environmental hazards, especially floods
- Work alongside the National Flood Insurance Program to create a low-cost flood insurance plan for physical assets creating a safety net for low-income underinsured populations that is accessible to undocumented individuals

2.3. Data Analysis and Interpretation

2.3.1. Analysis Methods

For data analysis, a combination of quantitative methods like statistical analysis and qualitative methods such as thematic analysis of survey responses would be utilized. This approach will offer insights into demographic trends, correlations between variables, and thematic patterns in community needs and challenges. Additionally, geographic information system (GIS) mapping would aid in visualizing flood risk areas and targeting outreach effectively.

The newly collected data will support our work by providing a detailed understanding of the socio-economic landscape of flood-prone communities, and identifying specific vulnerabilities and disparities. It will help in pinpointing limitations hindering underinsured communities from safeguarding their assets against environmental hazards, enabling the development of tailored solutions. Moreover, collaborating with the National Flood Insurance Program to create affordable insurance options directly addresses the needs of low-income populations, including undocumented individuals, thus enhancing financial security and resilience within these communities.

2.4. Data Policy Considerations

In the final leg of the TOC it is essential to reiterate that policy makers should utilize the dataset to realize our ultimate goal, to improve the insurance of assets of individuals in flood-prone regions. Policy makers should feel empowered with our dataset, whatever it may yield. Our proposed data collection strategy will produce high quality data. Our method of data collection was very spatially and socially specific, engaged, and totalizing, to a degree that other policy-informing data sets, like the ACS is not. However, considering the efficacy of the proposed plan, policy makers should remain aware that the communities we seek to engage are often, and in many books undocumented and thus hard to reach – thus, policy makers should exceed their data-based estimates for need. Furthermore,

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