

# Lessons on Climate Change and Poverty From the California Drought

By Wendy Ortiz August 2015

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### Introduction and summary

The entire state of California is experiencing its worst drought in 1,200 years.<sup>1</sup> Reservoirs, underground aquifers, and snowpacks are at all-time lows, forcing the state government to make unprecedented decisions about the allocation and conservation of the state's water resources. For example, the total amount of water stored in the Sacramento and San Joaquin river basins was 34 million acre-feet below normal in 2014.<sup>2</sup> Because the California drought threatens the capacity of the nation's leading agricultural producer, it may have disastrous consequences for everyone living in the United States. Human-driven climate change is altering the natural variability of the climate, and droughts like this one are likely to continue to occur.<sup>3</sup>

The effects of climate-fueled extreme weather events such as the current California drought, however, are not felt equally. Rather, they exacerbate existing socioeco-nomic inequalities. In California, communities of color and low-income people living in tribal, rural, and farming communities have been carrying a disproportionate share of the drought's burden since it began in 2012.

The enduring effects of racial segregation and the underinvestment in low-income communities—in California and elsewhere—have placed people of color and low-income people in environments that threaten their physical and emotional health. Low-income communities and communities of color are most vulner-able to the effects of climate change due to poor-quality housing and infrastructure,<sup>4</sup> proximity to environmental hazards,<sup>5</sup> and economic instability.<sup>6</sup> Because these communities have been institutionally excluded from accruing wealth and assets<sup>7</sup>—which are prominent indicators of a family's ability to prepare for unexpected shocks—they are less able to survive and recover from disastrous events.

Recognizing the unequal impacts that the drought has had on low-income people living in tribal, rural, and farming communities, California Gov. Jerry Brown (D) approved a \$1 billion drought relief package for small and rural communities.<sup>8</sup>

The drought relief package, which the legislature passed on March 19, 2015, will provide direct relief to agricultural workers and communities who have been most affected by the California drought. The bill also provides "an additional \$17 million for emergency food aid, \$4.4 million for disaster recovery support, and \$24 million for emergency drinking water in small and disadvantaged communities impacted by the drought."<sup>9</sup>

On April 1, 2015, Gov. Brown signed an executive order instituting the first obligatory water conservation plan in the state. The order imposes a 25 percent reduction in urban water usage by water suppliers to all California cities and towns through February 28, 2016; provides a statewide rebate program to replace appliances that are water inefficient; requires replacement of 50 million square feet of lawns with drought resistant landscapes; restructures water fees and penalties; and regulates underground water use.<sup>10</sup> As of April 2015, Californians in cities and towns had "increased their water conservation to 13.5 percent."<sup>11</sup>

While the drought relief package for small and rural communities is an important step toward addressing the myriad issues that affect access to clean and affordable water, policymakers must do more to protect the livelihoods of low-income communities and communities of color from the direct and indirect consequences of the drought. Agricultural communities throughout the state are suffering from high rates of unemployment, limited and costly access to safe and affordable water, food insecurity, and health issues related to toxic underground water. California A.B. 685, The Human Right to Water Bill—passed on September 25, 2012 made safe, clean, affordable, and accessible water a fundamental human right.<sup>12</sup> This drought poses a significant challenge to that responsibility and commitment.

California's drought should also serve as a wakeup call for other U.S. states that are at risk for a severe drought, especially in the context of existing economic inequities among residents. This report explores the intersection of climate change and inequality in the context of the California drought, highlighting the unique and disproportionate challenges faced by California's low-income and farming communities. Finally, the report offers recommendations for better addressing these disparities with urgency in order to move toward justice. The recommendations include:

- Mandating that the agricultural sector be included in statewide greenhouse gas, or GHG, reduction standards
- Developing water reduction standards for riparian water rights holders
- Lifting the 15-service-connection minimum for water systems to receive financial support in order to help residents who rely on small, private wells
- Supporting and incentivizing climate resilient resource planning and management
- Focusing on green water-infrastructure projects
- Making the lives of the people most affected by the drought central to federal, state, and local decision-making processes regarding the state's management of water resources

With a drought-produced deficit of 11 trillion gallons of water, continuous high temperatures, and no relief in sight, the state of California should focus on short- and long-term resolutions that center around the well-being of historically divested communities.<sup>13</sup> Implementing the recommendations outlined in this report would be an important step in that direction.

# The causes and severity of California's drought

Because California regularly goes through cycles of wet and dry years, periodic droughts are a natural occurrence in the state's climate. However, the 2012–2015 drought has been exacerbated by record warmth in the state caused by climate change.<sup>14</sup> Climate change is expected to increase the severity of the current drought, which has the potential to become a megadrought—a period of minimal rain and significant loss of soil moisture that lasts for several decades.<sup>15</sup>

Human activities—such as the burning of fossil fuels for electricity, on-road vehicles, industrial production, and agriculture—release heat-trapping gases into the atmosphere. Greenhouse gas emissions have been the primary cause of climate change within the past 50 years.<sup>16</sup> On a global scale, industrial agriculture accounts for 14 percent of GHG emissions.<sup>17</sup> In the United States, it accounts for 9 percent of total emissions;<sup>18</sup> industrial farming practices in California—from infrastructure development to production, packaging, and transportation—contribute significantly to this total.<sup>19</sup>

More than one-third of the nation's vegetables and two-thirds of the nation's fruits and nuts are grown in California,<sup>20</sup> and this produce travels an average of 1,500 miles before being eaten.<sup>21</sup> Over the past century, California's industrial farms have become increasingly reliant on synthetic nitrate fertilizers to produce more food at a faster rate.<sup>22</sup> Synthetic nitrate fertilizers release nitrous oxide into the atmosphere, where it can dwell for up to 114 years.<sup>23</sup> Carbon dioxide, another GHG emitted into the atmosphere from petroleum used during transportation, accounts for 27 percent of U.S. emissions. According to the Environmental Protection Agency, or EPA, "Greenhouse gases act like a blanket around Earth, trapping energy in the atmosphere and causing it to warm."<sup>24</sup> Permanent rises in the earth's average temperature have the potential to create large and disastrous changes in climate and weather and are likely exacerbating the current drought and creating the conditions for low food production in California.<sup>25</sup> As of June 2, 2015, the entire state of California was experiencing varying levels of drought, according to the U.S. Drought Monitor.<sup>26</sup> Ninety-four percent of the state, in terms of geographic area, was experiencing a "severe" drought, which is the second-highest level of intensity, while 47 percent of the state reached "exceptional" levels—the highest level of intensity.<sup>27</sup> These figures are higher than last year's levels during the same period: In June 2014, only 25 percent of the state was experiencing an "exceptional" drought, meaning that the percentage of the state enduring the highest level of intensity almost doubled within one year.<sup>28</sup>

Snowpack levels typically reach their peak in April and begin to run off into reservoirs and streams as the weather warms. As of May 1, 2015, statewide snowpacks, which provide about one-third of the water used by cities and farms, were at 3 percent of their average water capacity.<sup>29</sup>

During nondrought years, underground aquifers supply almost 38 percent of California's water for urban and agricultural use.<sup>30</sup> During dry years, that share increases to 46 percent or more as surface water levels decline and pumping for groundwater becomes the only option.<sup>31</sup> Excessive underground drilling has contributed to long-lasting land degradation as a result of underground water depletion and has also caused topsoil loss. In some parts of the Central Valley, the land has sunk as much as 12 inches per year since the drought began four years ago. Thus far, topsoil loss has led to infrastructure and canal damage and sinking bridges.<sup>32</sup> Siphoning unlimited underground water without replenishment depletes water that has accumulated deep in the earth for hundreds of thousands of years and diminishes the state's main source of reserve water.<sup>33</sup>

According to a University of California, Davis, Center for Watershed Sciences report, the drought had caused a net water shortage of 1.5 million acre-feet throughout the state as of July 2014.<sup>34</sup> This water shortage did significant damage to California's agriculture industry, which suffered a \$1.5 billion loss in 2014 as a result. The \$1.5 billion loss included an \$810 million loss in crop revenue, a \$203 million loss in dairy and livestock value, and \$454 million in additional costs for groundwater pumping. The total statewide economic cost of the 2014 drought amounts to \$2.2 billion when the loss of 17,100 agricultural jobs is included.<sup>35</sup>

The drought will continue to affect every sector of California's economy, including agriculture, energy, wildlife, and local industries.<sup>36</sup> This trend threatens America's food supply, hurts rural economies and communities, and is likely to place further strains on low-income households throughout the state.

# The drought's impacts on the national food system

The direct and indirect effects of the drought are driving down crop production across California farms, affecting both crop yields and prices. Sparse access to water for irrigation and higher temperatures threaten the quantity and quality of food grown in the state. According to Professor Timothy Richards of the W.P. Carey School of Business at Arizona State University, limited crop production has caused slight fluctuations in price on a national scale, with food price increases projected for the future.

#### California's food production capacity

Crop production in California—the leading agricultural producer in the nation is declining because of direct and indirect consequences of the drought. During nondrought years, California is the nation's number one fruit producer, growing a majority of the nation's grapes, plums, strawberries, peaches, nectarines, raspberries, artichokes, olives, dates, and avocados.<sup>37</sup> Two-thirds of the nation's produce and 80 percent of the world's almonds come from a 450-mile stretch of land: California's Central Valley. This area alone grows 230 varieties of crops and requires an immense amount of capital, land, water, and labor for production.<sup>38</sup>

Farmers throughout the state of California have seen a decrease in crop yield as a direct result of a spike in temperatures, a decrease in rainfall, and inconsistent access to water since the beginning of the drought. The following data gathered by the U.S. Department of Agriculture, or USDA,<sup>39</sup> looks at the percent change in volumes of various commodities from 2011–2013 averages to 2014 levels.



available at http://www.nass.usda.gov/Publications/Todays\_Reports/reports/ncit0115.pdf; National Agricultural Statistics Service, Noncitrus Fruits and Nuts Final Estimates 2007-2012 (U.S. Department of Agriculture, 2014), available at http://www.nass.usda.gov/Publications/Todays\_Reports/reports/fnutsb14.pdf.



Lack of water for irrigation has had a negative impact on farmers' operations at every level. During wet years, farmers irrigate their farms with water from various sources. The Central Valley Project, or CVP—a network of canals and aqueducts that draws water from the Sierra Nevada snowpack—is a major source of water for 3 million acres of farmland and for six out of the seven most productive farm counties in the country.<sup>40</sup> Because snowpack levels are at an all-time low, however, the Bureau of Reclamation estimated that most farmers would receive almost no water from the CVP in 2015, for the second consecutive year.<sup>41</sup> As a result, farmers who have run out of water for irrigation and do not have the financial means to dig wells on their property or access water from other sources have been forced to let their crops perish.<sup>42</sup>

While the depletion of water in reservoirs and underground aquifers poses the greatest direct threat to agricultural production in California, farmers must also contend with the indirect impacts of warmer temperatures. The quantity and quality of most crops is likely to decline as climate change causes earlier springs and warmer winters. Warmer temperatures create a flourishing environment for pathogens and parasites, leading to greater incidences of diseased crops and livestock.<sup>43</sup>

Although production from California farms has declined, consumers have not yet felt the impact of low production because international imports have increased to keep food accessibility stable. According to the USDA, a decrease in the production of some of the hardest-hit crops has not necessarily translated into less accessibility to these crops at major grocery stores that buy internationally grown produce. Fruit, tree nut, and vegetable imports continue to rise rapidly as demand grows and as California's production capacity continues to decline because of the drought.<sup>44</sup>

However, small and large grocery stores throughout the state are noting that the drought is a potential inhibitor to their ability to sell fresh produce. The California Grocers Association—which represents 80 percent of all grocery stores in California—is concerned that limited planting and produce yield among California farms may lead to a limited supply of certain kinds of produce in grocery stores. Although the impact on each type and size of grocery store is speculative, large grocery stores have the advantage of global distribution systems to offset the lack of availability of certain kinds of drought-affected produce.<sup>45</sup> This level of security, albeit temporary and uncertain, is not afforded to smaller grocery stores or corner stores, which are often the main suppliers of food for rural and urban low-income communities.<sup>46</sup> Both large and small grocery stores, especially those that sell produce primarily from California farms, have expressed concern about how natural disasters such as the current drought will impact the ability of local families to access affordable and nutritious food.

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As the drought threatens the availability of certain produce at small and corner grocery stores, low-income families may be forced to make decisions that sacrifice their nutritional needs<sup>47</sup> and increase their likelihood of physical illness.<sup>48</sup>

#### Price of food

Although future price hikes are speculative, lowered agricultural output caused by water scarcity and the increasingly high cost of water for irrigation may lead to higher food prices in the future. Grocery stores across the United States have already experienced slight fluctuations in food prices, which some experts believe will continue to rise as the drought leads to low agricultural output.<sup>49</sup> A 2014 study by Timothy Richards predicted that numerous fruits and vegetables—such as avocados, berries, broccoli, grapes, lettuce, peppers, tomatoes, and packaged salad—would increase by 23 cents to 80 cents per pound by the year's end.<sup>50</sup> The lack of water has also affected food produced from livestock. For example, the price of beef and other dairy products rose by 10 percent to 12 percent over the same time period.<sup>51</sup> As of June 2015, the USDA projects that fresh fruit prices will increase by 2.5 percent to 3.5 percent, while vegetable prices will rise by 2 percent to 3 percent by year's end.<sup>52</sup>

For the first time since 1977, the State Water Resources Control Board, or SWRCB, is sending curtailment notices to some riparian rights holders in an attempt to conserve more water.<sup>53</sup> Riparian, or senior, water rights allow people who own land that is directly adjacent to a source of water to use a share of the water flowing past their property. Appropriative, or junior, rights are instead granted on a first-come, first-served basis. Senior water rights holders have a higher priority to water than junior water rights holders, especially during drought years.<sup>54</sup> According to the SWRCB, if senior rights holders' water is diverted per recent curtailment notices, the price of food grown in California will see slight increases in prices, as farmers will rely on more expensive groundwater to help produce their most valuable crop yields.<sup>55</sup>

Low agricultural output and potential water diversion plans spurred by the drought have the potential to increase the price of food nationwide. While price increases have been modest so far, even slight fluctuations can affect a low-resourced family's ability to meet its nutritional needs.

# The demographics and water rights of California's agricultural communities

While water scarcity due to the drought has become the greatest problem affecting California farmers, not all farmers are suffering equally. California's antiquated water rights system exacerbates existing economic inequalities; some farmers are more able to cope with the drought than others. The drought also has a disproportionate impact on California's agricultural laborers.

#### California's farmers

California's water rights, which are based on seniority, have forced newer farmers and some first-generation immigrant farmers to discontinue their water use for irrigation, while riparian water rights holders' access to water has remained largely uninterrupted.

Access to economic resources has created unequal outcomes between more well-established farmers and newer farmers who lack seniority. Farmers with greater economic resources or assets to leverage have continued to irrigate their crops by digging new wells on their property, which cost approximately \$300,000 to \$350,000.<sup>56</sup>

The hierarchy of California's water rights and the extravagant expenses needed for underground drilling create a stark disadvantage for newer and first-generation immigrant farmers in the Central Valley. Hmong and Laotian farmers are some of the newest and most disadvantaged farmers in California. Many of them came to the United States as refugees and are using their extensive knowledge of agricultural practices from their native lands to escape poverty in this country.<sup>57</sup>

#### The plight of junior water rights holders

May Vu lives in Fresno County and is a prominent vendor at the Fresno County farmers markets. Over the past several years, she has grown flowers, broccoli, sin qua, cilantro, green onion, and bitter melon on 11 acres of land.<sup>58</sup> As her onsite well began to run dry, she was forced to decrease her operation to 5 acres of land and applied for a \$7,000 loan from the USDA Farm Service Agency to dig deeper into her well.<sup>59</sup> Her request was denied because she leases her farmland rather than owning it. Eighty percent of Hmong and Laotian farmers lease their farmland, essentially making it impossible for them to access the USDA resources necessary to withstand the drought.  $^{\rm 60}$ 

Newer farmers, such as May Vu, who hold junior water rights are first in line to receive water curtailment notices. When normal water allocation is diverted, farmers must rely on underground drilling to continue irrigating their crops. When faced with economic instability and federal and state funding eligibility restrictions, smaller, first-generation farmers are left with no other recourse but to allow their lands to fallow.

#### California's farm laborers

In California, between 2009 and 2011, 92 percent of farmworkers were Latinos from Mexican and Central American communities, and an estimated 77 percent of those workers were undocumented.<sup>61</sup> Within the past 20 years, California has seen a threefold increase in indigenous farmworkers from Mexico and Guatemala who speak an array of indigenous languages.<sup>62</sup> Indigenous farmworkers experience unique challenges because many come to the United States as monolingual, non-Spanish speakers.<sup>63</sup>

Farm laborers tend to be poor, lack health insurance, and live in substandard housing. They often endure slave-like working conditions to avoid deportation or loss of employment.<sup>64</sup> In 2011, the average annual income for California's farm laborers was \$14,000. Nearly 75 percent of laborers were earning less than 200 percent of the federal poverty line. Nearly two out of three workers had no health insurance, and only 16 percent were covered through Medi-Cal, California's Medicaid health care program.<sup>65</sup>

The National Climate Assessment reports that "the poor, the very young, and some older people have less mobility and fewer resources to cope with extremely high temperatures, increased water scarcity, environmental degradation, and other impacts."<sup>66</sup> Farm laborers and the rural farming communities in which they reside are one of the hardest-hit groups among those whose daily livelihoods are being threatened by the California drought.

#### Droughts undermine Native Americans' way of life

Native Americans are another especially vulnerable community whose livelihoods are at risk of being disrupted because of the California drought.<sup>67</sup> Droughts uniquely affect tribal nations because their native identities, ceremonies, practices, cultures, foods, medicines, and languages are often tied to a specific place and land. Many tribal communities, having already been systematically displaced from their native lands,<sup>68</sup> lack access to water during nondrought years because of dams that divert their nearby water sources to other communities in California.<sup>69</sup> For example, the current drought has caused the decrease in the coho salmon population upon which the Hoopa and Yurok tribes in Northern California rely. Salmon in general is vital to the preservation of the Hoopa fishing practices, diet, creation story, and religion. Salmon are also critical to the culture of the Yurok tribe,<sup>70</sup> which holds a salmon festival every year.<sup>71</sup> As the drought causes decreased water levels in streams and rivers and the state makes decisions about water allocation, the Hoopa and Yurok fear that the coho salmon—which are already on the federal and state endangered species lists—will be lost forever.<sup>72</sup>

# Impact on low-income agricultural communities in California

The direct and indirect consequences of the drought are disproportionately affecting low-income agricultural communities across California. Among other unique challenges, these communities face high unemployment rates, lack of access to clean and affordable water, drought-related health complications, food insecurity, and rising utility bills.

#### Employment losses

The California drought has led farmers to let 500,000 acres of farmland lay fallow, which has decreased crop production and cost approximately 17,100 farmworkers their jobs. Richard Howitt—a professor emeritus at the University of California, Davis, who studies the economic impacts of the drought—explained that farm laborers are "least able to roll with the punches."<sup>73</sup> Howitt noted "pockets of extreme deprivation where they are out of water and out of jobs" and predicted that "there are going to be more pockets of pain and poverty."<sup>74</sup> In his 2015 report, Howitt estimated that an additional 20,000 jobs would be lost in agriculture and food processing over the course of 2015.<sup>75</sup>

A common motto among farm laboring communities has been, "No water, no work, no life."<sup>76</sup> As the drought creates high rates of unemployment and as extremely low wages are further decreased by low agricultural production, families fall deeper into poverty. Contract labor—paying farm laborers by how much they pick, as opposed to an hourly wage—is still a common practice among California farms.<sup>77</sup> Daily wages are contingent upon multiple factors that are largely outside of farm laborers' control. As farmers leave thousands of acres of farmland fallow because of the drought, the farm laborers who have remained employed now have far fewer crops to pick and are thus earning far less money than they would have in nondrought years. Through no fault of their own, fewer crops to pick means less money to be made. This has led to economic devastation for their families and communities.<sup>78</sup> Having low to no wages means that farm laborers have less money to access basic necessities such as shelter, water, and food for their families. Entire communities of farm laborers are facing extreme poverty as a direct result of the drought. As agricultural jobs become scarcer, some agricultural workers have begun to move elsewhere or to travel long distances in search of employment.<sup>79</sup> A stark decline in population or overall earnings for individual families in small, rural towns has led to lowered consumer spending and a decrease in tax revenue to fund public services such as education and emergency responders.<sup>80</sup>

The enduring effects of historical farm labor devaluation have created high concentrations of poverty-stricken families living in divested communities with crumbling or inadequate housing and water infrastructure.<sup>81</sup> As the California drought persists, the people who supply the labor that feeds two-thirds of the nation are struggling to overcome bleak employment opportunities amid a backdrop of other inequities related to clean and affordable water access.

#### Limited access to clean and affordable water

In 2012, California became the first state in the nation to pass legislation affirming that access to water is a fundamental human right.<sup>82</sup> A.B. 685 was passed into law on September 25, 2012, and states that "every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes."<sup>83</sup> However, farm laborers living and working in California's agricultural communities experience unique barriers to water access because of their small water systems, competition with surrounding farms for underground water, and contamination from agricultural and oil production operations.

Small and rural communities face unique challenges in building alternative water sources, pipelines, and wells because they are geographically isolated from larger water systems and cannot access the technical and financial resources necessary to meet both Environmental Protection Agency regulations and growing customer water expectations. Furthermore, small, local water agencies are often understaffed and lack the financial resources to make infrastructure repairs, install water treatment plans, or develop long-term comprehensive water protection plans.<sup>84</sup>

The Safe Drinking Water State Revolving Fund—a policy measure adopted by the State Water Resources Control Board on January 1, 2015—allows community water systems and nonprofit, noncommunity water systems to apply for funds to replace defective water meters, treat contaminant levels in the water, and replace

aged water systems.<sup>85</sup> Unfortunately, such funds are only available for public water systems, which the EPA defines as water systems that make at least 15 service connections—defined as the connection between a customer's household and the water system—or regularly serve at least 25 individuals.<sup>86</sup> Up to 2 million California residents are served by the 250,000 to 600,000 private wells that make fewer than connections.<sup>87</sup> These EPA stipulations further marginalize the lowincome communities who live in sparsely populated, unincorporated areas across California and who disproportionately retrieve their water from private wells.

For the low-income people living in rural agricultural communities in the Central Valley, access to clean and affordable water for personal use has become an especially grave concern. Tulare County, for instance, is the most impoverished county in the state: Nearly one-third of residents in the area live below the federal poverty line.<sup>88</sup> Many residents in Tulare County and the surrounding unincorporated lands rely on personal property wells to retrieve water. In these communities, agricultural wells and domestic wells pump water from the same underground aquifers. As the drought quickly depletes farmers' access to surface water, farmers who can afford to drill deeper wells to access underground water for irrigation simultaneously deplete the water available for household use.<sup>89</sup>

In August 2014, Tulare County Supervisor Steve Worthley acknowledged that unregulated drilling by surrounding farms has detrimental collateral impacts on individual households who retrieve their water from the same aquifers but often lack the financial means to dig deeper into their own wells.<sup>90</sup> In August 2014, Worthley told KQED News, "We're not in a position to tell farmers, 'No you can't have a permit to drill a well so you can keep your crop alive,' even though we know it has collateral impact."<sup>91</sup>

The local water agency in Tulare County has suggested that individual households pay the \$7,000-\$15,000 expense to dig deeper wells, an option that is nearly impossible for the county's high percentage of low-income families.<sup>92</sup> Because further drilling is too expensive, residents have been forced to purchase and transport water to their homes and use bottled water rations set by the county.<sup>93</sup> These efforts are rarely enough to secure sufficient water for families' personal use. Families often have to forego showers, washing clothes, cooking, and cleaning for fear of running out of water too soon.<sup>94</sup>

#### Health complications

Farming communities' health is compromised by the drought. Issues with aridity and water safety pose significant long-term and dangerous health risks for families living in the rural agricultural sectors of the state. Extended periods of drought coupled with high winds and soil erosion are creating hazardous dust problems in the Central Valley. The 500,000 acres of fallowed farmland caused by the drought have reduced vegetation and increased the amount of ground surface particles in the air.<sup>95</sup>

The American Lung Association's "State of the Air 2015" report states that the drought has increased the number of days with high short-term particle pollution in the Central Valley. For example, the Fresno-Madera area—home to hundreds of thousands of agricultural workers—is the most polluted metropolitan area in the nation and received an F rating in air quality.<sup>96</sup> High short-term particle pollution in this area affects at least 955,272 people—268,773 of whom are low-income residents.<sup>97</sup> The increased air pollution that results from fallowed farmland produced by the drought places these communities at greater risks for asthma, chronic obstructive pulmonary disease, and cardiovascular disease.<sup>98</sup>

As with water shortages caused by the drought, the burden of air pollution exposure is unequally shared: Low-income communities and people of color already have a higher exposure to toxic air, soil, and water.<sup>99</sup> The California drought is worsening the already disproportionate impact of air pollution as underground water drilling and fallowed lands further degrade the state's natural resources.

#### Health impacts of chemical exposure

amilies in the Central Valley not only have to compete with farms for access to water but also have to deal with chemical contamination in their water from the agricultural and oil-producing sectors.

In January 2015, the Monterey County Office of Emergency Services drafted a report citing the drought as a potential cause of increased contaminant levels in groundwater supplies.<sup>100</sup> As the drought causes water levels in reservoirs, lakes, and underground aquifers to fall, concentrations of dissolved toxins, such as arsenic and nitrates, begin to rise.<sup>101</sup> Industrial agriculture and oil and gas operations mobilize heavy metals such as arsenic<sup>102</sup> and thallium<sup>103</sup> from the earth's crust into surface water and increase human exposure.<sup>104</sup> In 2014, high levels of thallium, arsenic, and nitrates were found in underground aquifers in the Central Valley.<sup>105</sup> Thallium is highly toxic and believed

to target primarily the central and peripheral nervous systems.<sup>106</sup> Arsenic exposure through drinking water has been linked to a variety of diseases, including bladder, lung, kidney, and skin cancers, as well as diabetes.<sup>107</sup> In addition, runoff fertilizers from industrial agriculture can increase exposure to nitrates, which can cause the serious blood disorder methemoglobinemia, especially among infants less than 4 months old.<sup>108</sup>

Many more families in Monterey County and other nearby communities may be forced to rely on bottled water supplies as groundwater levels decline and groundwater becomes too hazardous to drink. Lack of oversight by state regulators in agricultural and oil operations has dangerously placed neighboring families at risk for health issues and threatened the safety of California's scarcest resource.

#### Food insecurity

In California, food insecurity—the limited or uncertain availability of nutritious foods or the uncertain ability to access these foods due to lack of resources—rates are already higher than the national average.<sup>109</sup> Among farming counties in the Central Valley, rates swell by an additional 1 percent to 4 percent.<sup>110</sup>

Food banks—often the first line of defense against food insecurity—are being constrained by the drought. Across the state of California, food banks are grappling with the effects of low agricultural production from the Central Valley. The Alameda County Community Food Bank, or ACCFB, provides nonperishable foods and produce to 240 charitable food agencies. During its 2014 fiscal year, it provided 24.2 million meals.<sup>111</sup> Fifty-eight percent of the food it provided was intentionally sourced from local California farms to ensure freshness of produce and to keep transportation costs low.<sup>112</sup>

The ACCFB currently pays 11 cents per pound of produce, which includes picking, packing, and freight costs.<sup>113</sup> However, the ACCFB administration worries that California farmers with low agricultural output may transfer additional costs to the food bank. It also fears having to source its produce from out-of-state farms, which would drive up transportation costs. Even a 1 cent increase in the cost per pound of produce could amount to an additional cost of \$145,000 for the ACCFB and would have a detrimental impact on its ability to improve food security for the families that it serves.<sup>114</sup>

The San Diego Food Bank serves 370,000 people each month, including agricultural workers in the area. However, the drought has meant less fresh, healthy produce available to feed families in need, particularly families in agricultural communities that are experiencing high rates of unemployment.<sup>115</sup> Similarly, the Second Harvest Food Bank of Santa Clara and San Mateo Counties, which serves rural communities from Daly City to Gilroy, receives an estimated 27 million pounds of donated food annually from California farms.<sup>116</sup> Drought-driven crop yield decreases are likely to result in less food being donated to these areas, which would have a negative impact on food insecure families living in food deserts, where fresh produce is difficult to afford and find.<sup>117</sup>

#### Rising utility bills

As a result of the statewide mandated water decrease, many local water districts have adopted higher water rates for all consumers, with extra fees for high-volume users, in order to pay for the rising wholesale cost of water. These local water departments argue that rate increases will deter the overconsumption of water by making it more costly.<sup>118</sup> As a result, low-income families throughout the state are struggling to afford the higher prices.

For example, the small community of Cantua Creek—comprised of mostly older, retired, or disabled farmworkers<sup>119</sup>—relies on water from the Westlands Water District, which has a federal water contract to procure water from large reservoirs to serve small, rural communities. The water supply passes through the district to Fresno County.<sup>120</sup> In April, the district tripled the price of water for Cantua Creek residents, causing the county to attempt to raise water fees by \$30 to cover the cost of wholesale water for the region. Residents refused to pay the fee increase, however, because the tap water is undrinkable and because they already pay additional money to access drinking water.<sup>121</sup> Short-term drought emergency funds provided by the state could help Cantua Creek cover its water bill. However, the SWRCB is requiring residents to decrease their water use even further.<sup>122</sup> Tensions between local water districts that feel the urgency to conserve water and residents who feel the unequal burden of paying more for toxic water remain a point of contention among small, rural communities.

Individual households throughout the state are also paying more for their energy bills as hydropower energy continues its three-year downward trajectory. Insufficient water to generate energy in California has spurred an increased reliance on the burning of fossil fuels for energy. This shift has cost ratepayers \$1.4 billion in utility bills and produced an 8 percent increase in carbon dioxide emissions, setting California back on its goal of generating 33 percent of its electricity from renewable energy by 2020.<sup>123</sup>

Increased utility bills place excessive pressures on low-income families, who already spend a large portion of their earnings on rent and utility costs. Jerry Tinoco, South Kern community programs coordinator at the Community Water Center in Arvin, California, stated, "It's absurd that people in poor communities have to pay for bottled water or filtration systems on top of having to already pay for a water bill. In some cases they can pay up to 10% of their income in alternative drinking water expenses."<sup>124</sup> Low-income families are also more likely to experience income volatility, meaning that fluctuations in various monthly costs could be detrimental to meeting their most basic needs. Coupled with high unemployment rates and other unexpected expenses, low-income families in California will experience further economic strain as the drought continues.<sup>125</sup>

## Policy recommendations

As the drought continues to ravage California and threaten the livelihoods of the communities that put food on our tables, federal, state, and local policymakers must take immediate action that involves community grassroots organizers as indispensable stakeholders in the water management decision-making processes. Together, they must work to mitigate the impacts of the drought on low-income families and work preventatively to strengthen community resiliency in low-income, rural, and tribal communities.

#### Cut greenhouse gas emissions from industrial agriculture

California can reduce its statewide GHG emissions by ensuring that industrial agriculture is included under the state's climate change law, the California Global Warming Solutions Act of 2006. Congress should ensure that states have the resources to cut their carbon pollution and build systems for alternative energy sources. California continues to be the nation's leading agricultural producer, yet industrial agriculture is mostly excluded from the California Global Warming Solutions Act, which requires California to reduce its GHG emissions by 15 percent by 2020.<sup>126</sup>

Agricultural practices are responsible for approximately 9 percent of U.S. greenhouse gas emissions,<sup>127</sup> which can exacerbate climate conditions for drought. Water efficiency, soil management, crop controls, and more judicious fertilizer and pesticide use can reduce the emissions and environmental impacts that correlate to drought conditions and reduced opportunities for Californian agricultural workers.<sup>128</sup> California industrial farms can alter their management of land, crop, livestock, and manure to decrease their GHG emissions, while still efficiently producing the same yield of food. Including industrial agricultural in the California Global Warming Solutions Act would make the agricultural sector accountable for the protection of the environment and people's health. The federal government, meanwhile, delivers science-based knowledge and resources to farmers, ranchers, forest landowners, and resource managers through its Climate Hubs program to support "climate-informed decision-making."<sup>129</sup> Because all programs are voluntary and incentive based, the U.S. Department of Agriculture should look to increase existing resources and incentives in the Southwest region, where California is located, to ensure that the state's farmers take greater measures to do their part to curb emissions.<sup>130</sup>

#### Develop water reduction standards for riparian water rights holders

The State Water Resources Control Board should develop water conservation standards for all sectors that parallel the expectations of conservation for urban and rural consumers in the state. While Gov. Brown implemented a mandatory water use reduction of 25 percent for urban cities and towns, the agricultural sector has been mostly exempt from these regulations; the governor indicated that it has suffered enough through fallowed lands, loss of revenues, significantly reduced water allocations, and thousands of farmworker layoffs.<sup>131</sup> Consequently, rather than imposing mandatory reductions on the agricultural sector, the governor allowed farmers time to develop their own plans. California farmers have until July 1, 2016, to submit detailed drought management plans that quantify the amount of water they used from 2013 to 2015 and describe the actions and measures they will take to manage water demand during the drought.<sup>132</sup>

Not all farmers, however, have shared in the burden of water conservation. Newer farmers who hold appropriative rights are in their second year of discontinued water use, while riparian rights holders have had almost uninterrupted access to water up until this year.<sup>133</sup> For the first time since the 1977 drought, the SWRCB sent curtailment notices to some senior rights holders in 2015.<sup>134</sup> In response, a group of riparian rights holders in the California Delta have agreed to voluntarily fallow 25 percent of their land or reduce their water access by 25 percent if they are exempted from future cuts, regardless if the drought worsens.<sup>135</sup> On May 22, 2015, the SWRCB approved these voluntary cuts and the stipulations associated with them.<sup>136</sup>

While riparian rights holders must share in the collective responsibility to decrease water use, conservation efforts should not involve guaranteeing future water allotments to those with seniority while thousands of families in the Central Valley go without water. By excluding riparian rights holders in the Delta from any long-term water rationing standards, the state sends a clear message that their right to the state's most scarce natural resource is more important than the daily livelihoods of the people who supply the labor that feeds the entire nation.

On March 1, 2014, Gov. Brown passed legislation expanding and streamlining the SWRCB's authority to enforce water rights laws and increase penalties for users illegally diverting water.<sup>137</sup> The SWRCB should ensure that riparian rights holders who have not voluntarily decreased their water use or fallowed their lands by 25 percent cooperate with conservation benchmarks and develop more efficient irrigation systems to decrease wasted water. As future decisions about diverting riparian water rights are made, the SWRCB should eliminate the delay between received curtailment notices and actual water curtailments by diligently tracking water use and enforcing financial penalties when necessary. Gov. Brown should also ensure that state regulators have sufficient sensors, meters, and other technology to track farmers' use of surface water and groundwater, report water use, and ensure enforcement when necessary.<sup>138</sup>

# Lift the 15-service-connection minimum for federal and state financial support

The Environmental Protection Agency should lift the 15-service-connection minimum for water systems to receive financial support in order to ensure that the 2 million California residents who rely on small, private wells can access funds from multiple sources, including the Safe Drinking Water State Revolving Fund. Renters, private well owners, and small water system users are often ineligible for federal or state funding because the EPA mandates that all eligible water systems have at least 15 service connections.<sup>139</sup>

On March 27, 2015, Gov. Brown signed a \$1 billion drought relief package for small-community water needs that included, according to a release from his office, "emergency food aid, drinking water, water recycling, conservation awareness, water system modeling, species tracking, infrastructure and flood protection funding."<sup>140</sup> While this drought package is an important step toward addressing the needs of rural and farming communities, upholding the 15-service-connection minimum adds an additional barrier to renovating or replacing inadequate water systems for communities that often have no other financial resources.

# Support and incentivize climate resilient water resource planning and management

The federal government should expand its collaborations with state, local, and tribal governments to assess climate change-related risks for water sources and support the development of sustainable water management plans. In 2013, the American Society of Civil Engineers gave the nation's infrastructure, including everything from water systems to bridges, a D+ rating and estimated that the cost of infrastructure development would amount to \$3.6 trillion by 2020.<sup>141</sup> Preventative investments in our nation's infrastructure can improve the quality of life in low-income communities, avert disastrous outcomes of extreme weather events, reduce disaster costs, create jobs, and drive economic growth.<sup>142</sup>

According to the president's State, Local, and Tribal Leaders Task Force On Climate Preparedness and Resilience, "The water sector is vulnerable to climate change through more intense droughts, extreme storm events, shifting precipitation, loss of mountain snowpack, Great Lakes water level decline, sea level rise, ecosystem changes, degradation of supply, storage, and delivery infrastructure, temperature rise, and other impacts."<sup>143</sup> As the task force shows, the federal government can play an important role in ensuring that all regions and levels of government utilize climate-smart water resource planning and management.

Federal contributions could include data sharing, providing technical assistance in evaluating water infrastructure, and developing climate change resilience strategies in project design. One successful model the task force points to is the Silver Jackets Program. Silver Jackets state teams are comprised of multiple federal, state, tribal, and local agencies that work together to reduce the risk of extreme weather events and enhance response and recovery efforts. Silver Jackets teams work preventatively and collaboratively to develop hazard mitigation, emergency management, flood plain management, natural resources management, and conservation plans. The ultimate goal is to have state-led interagency teams in every state that can use multiple financial resources, perspectives, and programming to find solutions for the consequences of weather-related events.<sup>144</sup>

The federal government should place a higher priority on working collaboratively with state and local agencies to develop and financially support climate resilient projects nationwide. Through interagency partnerships, the EPA, the U.S. Department of the Interior, and municipal water agencies can combine their resources to develop preventative climate resilient strategies that optimize the well-being of their states' residents and build a cohesive response when natural disasters do occur.

#### Focus on green water-infrastructure projects

Local governments must do more to develop green infrastructure projects that conserve and protect water resources. Localities and states bear the brunt of operation and maintenance costs for the vast majority of drinking water and wastewater systems. Unfortunately, a disproportionate amount of resources goes toward expanding those services to new customers rather than upgrading current systems. According to a previous Center for American Progress report, "While this expansion has brought clean water to new residential developments, this preference for new construction over repair does little to address the health and economic needs of the majority of communities reliant upon existing infrastructure."<sup>145</sup> As local communities rebuild crumbling infrastructure, they must build it back stronger and better, as well as in more cost-effective ways. Local leaders must explore lower-cost solutions to water quality and treatment challenges through green infrastructure investments.

Philadelphia, for example, is leading the way in green stormwater management. Stormwater runoff is a major urban polluter as it can pick up debris, chemicals, and other pollutants when it flows across sidewalks and driveways into sewer systems and waterways. However, green stormwater systems treat runoff through mechanisms such as green roofs or permeable surfaces that soak up the water. Philadelphia has pledged to green nearly one-third of its land over the next 25 years, creating a cheaper and more sustainable stormwater management system. As a result, Philadelphia is spending \$2 billion on projects but avoided the construction of a new \$10 billion tunnel under the Delaware River.<sup>146</sup>

#### Partner with local organizations and organizers

State and local governments should make community members integral stakeholders in the decision-making processes about California's state water resources management. The presence, voices, and experiences of the communities most affected by the drought should be at the center of any decisions being made on their behalf. It is vital for state and local governments to recognize that the rural and farming communities most affected by the drought have been organizing to voice their concerns and needs, as well as to secure funding to meet their demands. By building coalitions, community advisory boards, and consistent forums for public input, state and local governments can ensure that management plans will meet the needs of their constituents. For example, the Community Water Center, or CWC, in Visalia, California, promotes community-driven water solutions through organizing, education, and advocacy in the San Joaquin Valley. The CWC has empowered 2,674 local residents in 82 communities to improve their access to safe, clean, and affordable water. The CWC helps coordinate the Asociación de Gente Unida por el Agua, or AGUA Coalition, which meets every month to discuss the root causes of unsafe and unaffordable drinking water and policy solutions to address these barriers.<sup>147</sup> The Committee for a Better Arvin—a local grassroots organizing group in Arvin, California, that advocates for clean air, water, and land quality—successfully pressured the local water district to apply for state funding to provide arsenic-free water dispensing machines. Through its strategic planning, it was able to secure those machines. They were also instrumental in bringing to Arvin the Agua4All pilot program, which seeks to increase access to drinking water by making community members integral partners throughout the process of developing drought-related measures and by identifying areas that need new water stations the most.<sup>148</sup>

Farming communities across the state have been organizing themselves to pressure their local, state, and federal governments to fund short- and long-term solutions to the myriad water issues they experience on a daily basis, as well as to create permanent systems of accountability for the sectors polluting their water, air, and land. When project development around water issues is centered on the community's needs and strengths, the community members become the experts and arbiters in the decision-making process. Having a powerful and meaningful stake in local project development also prevents state and local agencies from making decisions on behalf of community members that may have future negative repercussions. State and local agencies must begin to see community members as having a wealth of skills, knowledge, experience, education, and motivation that should put them at the forefront of grassroots, local, state, and federal policy efforts to curb the consequences of the drought.

## Conclusion

Climate change is happening and will continue to cause more frequent, severe, and sustained extreme weather events on a national and global scale. California an agricultural superpower that produces more than one-third of the nation's vegetables and two-thirds of the nation's fruits and nuts—is suffering its worst drought to date. While the California drought disproportionately affects agricultural communities, the entire nation should consider how prolonged periods of drought in California threaten the nation's food supply. All Americans should consider the California drought as an example of how climate-related disasters will interrupt the daily livelihoods of low-income communities and communities of color across the United States.

It behooves federal, state, and local governments to work proactively to build climate resilient communities that can survive and recover from future extreme weather events. The California drought highlights the urgency of curbing the root causes of recent global climate change by reducing greenhouse gas emissions. It also demonstrates the need to manage natural resources in order to prepare for sustained periods of drought in the Southwest and to enact the recommendations outlined in this report to curb the impacts of the drought on low-income communities in California and across the nation.

Years of water overconsumption by multiple sectors, mismanagement of water resources, minimal tracking of underground aquifers, and poisoned water sources have degraded California's agricultural fields and adversely affected the land and the people who toil on it. As people who rely on the land for physical and—in the case of Native American tribes, spiritual nourishment—communities across the state are struggling to survive as their access to basic necessities is threatened by the persistent drought.

The costs of the drought are being disproportionately borne by rural and agricultural communities already stunted by centuries-old policies that have created conditions of high poverty and substandard, inadequate housing. In the midst of one of the state's worst natural disasters, however, California has a unique opportunity to address its long history of farm labor exploitation by centering decisions regarding the drought on the lives of the people who feed the entire nation. Rural agricultural communities in California should not be defined as communities of suffering but rather as proactive communities of people who are collectively organizing to secure their own shared well-being within and outside of local, state, and federal policy efforts.

#### About the author

Wendy Ortiz was an Emerson National Hunger Fellow with the Poverty to Prosperity Program at the Center for American Progress. Prior to joining the Center, she worked with the Texas Hunger Initiative in Dallas, Texas, where she was a community organizer and helped develop and facilitate organizing tactics trainings and supported localized efforts to address safety concerns, city services access, food injustice, youth development programming, and community economic prosperity. She also completed the program evaluation for the Family Garden Demonstration Project—an alternative gardening program aimed at increasing food security among low-income families.

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