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Drought in New Mexico

Climate change will affect the New Mexican landscape and people in a major way. Drought, wildfire danger, higher temperatures, and loss of vegetation are all examples of the effects of climate change in this region. As climate change progresses, drought will continue to alter this landscape and impact the mental health of the entire New Mexican community, particularly the rural community and community of farmers.

New Mexico is a high-altitude desert, with an average of 14 inches of precipitation per year. Water conservation is already a high priority for people living in New Mexico because of a history of drought. Droughts have been a "persistent risk in New Mexico" (Union of Concerned Scientists, 2016, p. 4). However, in recent years, droughts have broken historical records including an intense drought in the early 2000s and a 6-year drought beginning in 2009 (Union of Concerned Scientists, 2016, p. 4). The Union of Concerned Scientists (2016), states that "if heat trapping gases continue to build up in the atmosphere, future droughts are projected to far outstrip those of the past 800 years." As climate change continues to alter the landscape, water scarcity will have a growing impact on the community in New Mexico.

Warmer temperatures increase the need for water in every facet of life, from livestock to agriculture to everyday life (Union of Concerned Scientists, 2016, p. 3). As the climate warms, there will be an increase in evaporation into the atmosphere from surface waters, plants, and soils (EPA, 2016). Annual rainfall in the Southwest is predicted to decrease rather than increase as is predicted for much of the rest of the United States (EPA, 2016). This means that drier conditions will persist leading to more severe droughts in New Mexico.

Snowpack stores water and is an important source of New Mexico's water supply. Snowpack is predicted to decline due to higher temperatures and less snow fall. These higher temperatures will lead to earlier snowmelt into the major rivers, like the Rio Grande, which will result in decreased levels of water availability during "critical times of the year" (Union of Concerned Scientists, 2016, p. 4). Farmers and others that depend on the surface water will have to use ground water resources in order to keep their crops, herds, and agriculture alive. New Mexico's extraction from aquifers for irrigation and other needs far exceeds what the aquifer can naturally recharge (Climate, n.d.). Recently, the Rio Grande and Elephant Butte reservoirs were depleted to record low levels which decreased the allocation of water for irrigation to farmers by more than 90 percent in some places (UOCS, 2016, p. 3). This historical event forced the city of El Paso and some surrounding areas to rely on groundwater (UOCS, 2016, p. 3).

Annual rain fall is predicted to decrease in the southwestern United States; however, it is predicted that the monsoons in July and August may intensify (UOCS, 2016, p. 4). New Mexican's are accustomed to the dangers of flash floods and the environmental impacts associated with them. These impacts are predicted to increase as climate change affects the landscape. The soil will become more hydrophobic, or less able to absorb any water that falls upon it, due to drought-hardening or transformation by wildfire (UOCS, 2016, p. 4). The higher intensity monsoon storms may release more precipitation, but the percolation into the ground will be decreased, impacting the soil as well as the recharge of underlying aquifers.

Farmers and rural New Mexicans depend heavily on consistent water availability not only for survival but for economic production and livelihood. Drought has already hit farms and

farmworkers hard and will continue to do so as climate change progresses. One of the most serious side effects of climate change and drought on farmers is the mental health effects due to decreased production, economic loss, and decreased value of their crops and ranch lands. Increased depression and suicidal ideation could impact a larger number of farmers than ever before in New Mexico.

Health Impacts of Drought on Farmers

Farming and the agricultural sector are at the core of rural New Mexico. While the majority of the population of New Mexico resides in the larger cities around the state, rural towns are supported by and made up of primarily farmers and ranchers. These areas are also the most vulnerable to the impacts of climate change. Farmers and ranchers experience declined production and crop loss, as well as livestock failure due to drought conditions. Climate variabilities, including drought, along with financial difficulties are two of the most cited influences on the mental health of farmers (Daghagh Yazd et al., 2019).

Drought can be classified as a slow-moving disaster. The CDC reports that disasters can increase the risk of mental health and stress related disorders (CDC, 2020). Farmers in New Mexico are somewhat accustomed to dealing with the stress of water scarcity and drought; however, length and severity of drought is increasing. Farmers are increasingly worried about the future climate and economic insecurity and this is adding to their chronic forms of stress and anxiety. Mental health effects include depression, anxiety, anger, sleep problems, and suicidal ideation effect farmers, along with the rest of the population.

Agriculture and ranching comprise only around 2 percent of the states economic production, however due to the number of small farms, ranches, and businesses, there are

many people reliant on this sector (Repetto, n.d.). 43 million acres of New Mexico's land is dedicated to farm work and production, with 21,000 holdings (farms) spread across the land. Traditionally, much of New Mexico utilized acequias and surface water to irrigate crops and farmland. Droughts have necessitated the use of more and more ground water from the aquifers to supply enough water for farmlands. Ranchers and the production of beef and dairy products are also heavily reliant on consistent water, which is becoming increasingly scarce due to climate change. These economic hardships will affect farmers in different ways, but there is a significant amount of evidence showing the relationship between failing mental health and the economic effects of drought on farms. Employment and financial constraints caused by drought can lead to feelings of shame and humiliation in a community, increased workload, decreased time and resources, and familial and spousal stress (Vins et al., 2015). These outcomes are connected to a loss of social networks, isolation, uncertainty about the future, stress, and eventually depression, anxiety, and possibly even suicide (Vins et al., 2015). Drought can spur spiraling mental health episodes in farmers and their surrounding communities.

Farm owners are not the only population to feel the effects of drought on the land. Farm workers also face challenges associated with climate change. Multiple studies have shown that poor mental health is high in the farmworker population. Drought has caused farms in the New Mexico region to shrink or go under all together. Fewer farms or smaller farms means fewer jobs for farm hands, many of whom are migrant workers and already face adverse overall and mental health problems (Crain, 2012).

Rural communities often lack mental health services and also hold strong stigma relating to mental health issues. Farmers, especially male farmers, are seen in their communities as

masculine, stoic, providers, and tough men. These normative stereotypes impact farmers ability to seek help for their mental health (Vin et al., 2015). Rural communities also hold these self-reliant, stoic behaviors, this along with the fact that these communities are small and social visibility is high, makes community members even more reluctant to seek the mental health help that they may need.

Preparation, Mitigation, and Response

Farmers can prepare, mitigate, and respond to drought and climate change as well as the mental health consequences of drought and climate change. In order to prepare and mitigate the severity of the effects of droughts, farmers can take a myriad of actions on the land itself. While New Mexican farmers generally do employ water conservation practices and drought tolerant crops, there is always improvement that can be done. Rotating crops in ways that increase the soil moisture, switching crops to higher yield, drought tolerant plants, evaluating irrigation systems, and building more sustainable water storage systems are all possible ways to prepare for drought (NRCS, n.d.). New Mexico has a large beef and dairy production. Both of these avenues contribute significantly to greenhouse gases and climate change. New Mexican ranchers and beef and dairy farmers may want to think about moving away from these avenues of income and transition to more sustainable livestock options.

Mental health is stigmatized in the United States and around the world. People prefer to keep their mental health private regardless of how much they may be struggling. This stigma puts people at risk for worsening mental health outcomes and possible suicide attempts. Older adults in rural areas, like mand farmers throughout New Mexico, suffer silently rather than reach out to their community members or get help. In one study done by Stewart et al., rural

older adults suffered from untreated psychiatric disorders due to stigma being a barrier to utilization of mental health services at a higher rate than similarly aged urban adults (Stewart et al., 2015). Availability and access to these mental health resources is another reason why farmers may suffer higher levels of mental health consequences of climate change in the rural areas that they reside. Psychiatric hospitals, residential treatment centers, and access to mental health resources are lacking in rural counties in New Mexico (Scharmen & Licht, n.d.). There are 13 psychiatric facilities with 562 beds in the state of New Mexico, however, only one of these facilities is in a rural county (Scharmen & Licht, n.d.). Urban counties in New Mexico have 5.05 licensed behavioral health care providers per 1000 people in comparison to 3.28 per 1000 in rural counties (Scharmen & Licht, n.d.). Farmers have higher than average rates of depression, anxiety, and stress but have less access to mental and behavioral health resources. The health care community needs to focus their efforts on expanding, either in person or via telehealth, into rural communities and reaching out to farmers and farmworkers.

In preparation for an increase in mental health consequences due to climate change and drought in rural areas, health care and mental health care in these areas must be a priority. The need for psychiatric, psychologic, and behavioral health care providers is already lacking in rural New Mexico. Value must be placed on mental health and mental health resources should be distributed in all communities. While access to these resources is important, education surrounding mental health is also vital. In order to reduce stigma related to mental health care, communities must come together to recognize its significance and try to mitigate its impact. The rural community response to depression, anxiety, suicidality, and other mental health crisis in the future must be strong and supportive.

The Rural Health Information Hub has put together resources in their *Rural Response to Farmer Mental Health and Suicide Prevention* website (Rural Health Information Hub, 2020). The National Suicide Prevention Lifeline and the Farm Aid Hotline both connect farmers (anyone in need) to mental health resources. The Farm Crisis Center is also home to a myriad of resources specifically meant for farmers dealing with crisis, including a local resource network, mediation resources, national disaster resources, disaster assistance programs, and a weekly drought summary. The integration of these resources into rural New Mexican's and farmers everyday lives, through their primary care provider, nurses, and community members, could be lifesaving.

Recovery and Resilience

Resilience comes in many forms. Resilience can be in reference to a material, a person, or a system. Our systems can have resilience from a crisis or a disruptive process, like climate change. Our people can have resilience from illness, major life changes, and adversity. Climate resilience is "the ability to anticipate, prepare for, and respond to hazardous events, trends or disturbances related to climate" (C2ES, n.d.). Resilience is a psychological state of being and a way of thinking that enables us to cope with changes and possible risks. Resilience is in all of us, implementing that resilience in certain settings takes intentionality and practice.

Resilience is our ability to deal with change. Climate change is a really big, long lasting change that we all will have to deal with one some level. Climate resilience starts with understanding the possible threats and vulnerabilities climate change may have across the globe, from drought to economic impacts to receding glaciers to security issues (C2ES, 2019). Once an understanding is created, planning and implementation can take place. This planning

and implementation can look like every day individual actions of recycling and composting or transitions to more sustainable business practices or policy changes. Climate resilience can come in many forms, from individuals, to community level resilience, to governmental, national, and international resilience.

Resilience to climate change and drought in the farming world is vital for the longevity and success of agricultural production in New Mexico. Resilient farming relies on three key forms of adaptive capacity, response, recovery, and transformation (SARE, 2020). The implementation of all three of these adaptive capacities results in a resilient farming system. Response capacity is how farmers deal with current climate-related challenges, challenges happening currently (SARE, 2020). Recovery capacity is having the reserves or ability to return to full function after a climate event has damaged the farm in one way or another (SARE, 2020). Transformation capacity relates to making fundamental changes is your farming operation in order to enhance the response and recovery capacity now and in the future (SARE, 2020). Because drought is something that New Mexican farmers are accustom to, the likelihood of their ability to respond to and recover from drought or other climate changes is high. However, transformation capacity involves overhaul and larger changes, which may be more difficult, especially for farmers who have been on the land as long as most New Mexican farmers have been. In order for these farmers to adapt to climate change, they may need to implement large scale changes in their farming practices. A significant number of farmers in New Mexico use monocropping techniques and agricultural practices that need to be updated considering the climactic future. Utilizing these forms of adaptive capacity may enable farms to continue operating and even thrive in the future.

Another step in the direction of resiliency for farmers is to look back at the ancestral farming knowledge of this land. Indigenous people used resilience techniques from the very beginning, planting a variety of different crop types, utilized wild edibles, and used different sorts of land cover or cobble mulch to prevent water transpiration (Keibler, 2019). While the scale of indigenous farms is generally smaller than monocrop farming, some of these practices can still be implemented. Indigenous communities have been successful agricultural stewards of the land in New Mexico for many generations, sharing their knowledge is a good way to give back to the land and encourage a productive crop.

Farmers, along with the general public, need to cultivate psychological resilience in order to deal with the climate crisis. As previously explained, farmers are at high risk for adverse mental health risks related to drought and climate change, these include depression, anxiety, and suicide. Resilience in farming and rural communities can look like planning for increased access to mental health professionals and resources. It also involves a fundamental change in the way these communities and individuals view mental health and the possible adverse health risks associated with it.

Climate resilience is connected to the land we work on, the communities we live in, and our psychological wellbeing. Drought can be devastating to many farmers and farmworkers, but with a resilient outlook regarding climate change and the future, hope is still present.

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