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How Climate Changes Mental Health

Abstract

As the Earth's climate changes we are seeing, and will continue to see, increases in the prevalence and severity of mental health issues. These are worst in agricultural workers who live in drought prone areas, which are exacerbated by climate change. People living in environments put in danger by climate change are also at risk of depression and overall loss of happiness. This can be caused by the loss/reduction of iconic animals, plants, and landmarks. The mental wellbeing of human society is negatively impacted by increased awareness of the dangers posed by climate change. Forms of anxiety, depression, and denial are common responses. Proper climate education, focusing on realistic dangers posed to the individual, reduces these responses and encourages action.

Keywords: Mental Health, Climate Change, Drought, Education

Rising sea levels, flood, droughts, food shortages are what many people imagine when they think of climate change. While environmental changes are frightening, there is evidence of a more subtle, and arguably sinister, impact on the emotional wellbeing of human society as a whole. In the United States, depressive symptoms in teenagers have been consistently increasing for the past 20 years. Between 2011 and 2015, 50% more teens demonstrated clinically diagnosable depression. During the same 4-year period, the suicide rate of girls ages 12 to 14 tripled, and girls ages 15 to 19 increased by 50%. Child and teen hospitalization for suicidal thoughts and self-harm doubled between 2008 and 2015 (Casañas, et al 2018). This is an international epidemic and environmental stressors related to climate change are one of many probable causes. A survey of Australian children's opinions on climate change found that "a quarter of children are so troubled about the state of the world that they honestly believe it will come to an end before they get older" (Tucci et al, 2007). Our planet's youngest generations are growing up facing an uncertain future that they did not cause. Climate change needs to be addressed if we hope to improve this situation. Climate change has severe negative impacts on the mental health of individuals whether or not they are personally affected by it. This paper will first look at directly impacted individuals, and then examine the ways in which broader societal wellbeing is put in jeopardy. The demographic most directly endangered by climate change is agricultural workers affected by droughts.

Climate scientists overwhelmingly agree that climate change affects the frequency and severity of droughts in vulnerable regions. This is because greenhouse gasses raise air temperature. A greenhouse gas is any gas that absorbs and reemits energy from the Earth. They don't necessarily "trap" the energy, but they do send it back to earth a couple times before it finally exits the atmosphere. Each time this radiation "bounces off" the Earth, it

heats the planet, mostly warming the oceans and air (Benestad, 2017). Higher air temperatures increase the atmospheric demand for moisture (Dai, 2010). To meet this demand, evaporation occurs in soil and bodies of water, removing moisture and contributing to drought conditions. Changes in atmospheric circulation patterns are another factor which affect droughts. For example, climate change exacerbates the phases of the Indian Ocean Dipole. The IOD is an atmospheric cycle linking East Africa and the Western Pacific Ocean (Li et al, 2017). This cycle has 2 phases which govern its direction and swap every 3 years. As seen in Figure 1, during a negative IOD warm wet air rises in the east, causing rain in Southeast Asia. On the other side of the cycle, dry air settles over East Africa, reducing precipitation. With a changing climate, as the Indian Ocean's sea surface temperature increases more water is evaporated and joins the system. Thus, the affected regions are seeing more severe droughts and flooding, depending on the IOD's configuration. Floods and droughts don't simple "cancel each other out" because dry soil in less able to take up water, which causes floods to occur after heavy rain (Li et al, 2017). Both droughts and flood are detrimental to farmers and their communities. Increased air temperatures and changing atmospheric circulation patterns are expected to drastically increase the severity of droughts in the coming decades.

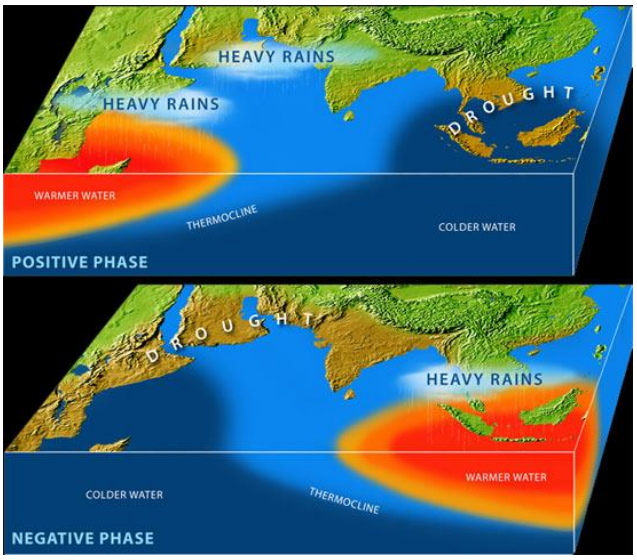

Figure 1: The two phases (positive and negative) of the Indian Ocean Dipole, and their effects on precipitation in various regions (Oberlander, 2016).

As droughts continue to worsen globally, we are seeing an increase in the ways in which they negatively impact the mental health of farmers and their communities. Farmers affected by droughts experience a great deal of mental and emotional distress. Farm owners are put into seemingly inescapable debt. Their workers experience a greater workload and feelings of isolation as friends and significant others are forced to find work elsewhere. These challenges encourage those left behind to follow suit, abandoning others and creating a self-perpetuating outflux of workers (Fritze, et al. 2008). Without social or economic intervention, these people become vulnerable to dying by suicide. According to the Indian Government, farmer suicide is one of the Indian agriculture sector's biggest threats in the 21st century. More than 300,000 Indian farmers and farm workers have died by suicide since 1995 (Parida, et al. 2018). Figure 2 illustrates a clear correlation between farmer suicide and drought in 17 Indian states. The blue bars indicate the average number of farmer suicides in each state from 1995 to 2011, while the orange bars show the percentage of that state's geographic area that is prone to droughts. The 5 states with the highest incidence of farmer suicide are also the 5 states with the highest percentage of drought prone area. This trend is seen internationally, with the worst suicide epidemics occurring in India, Australia, North America, and drought prone regions of Africa (Fritze, et al. 2008).

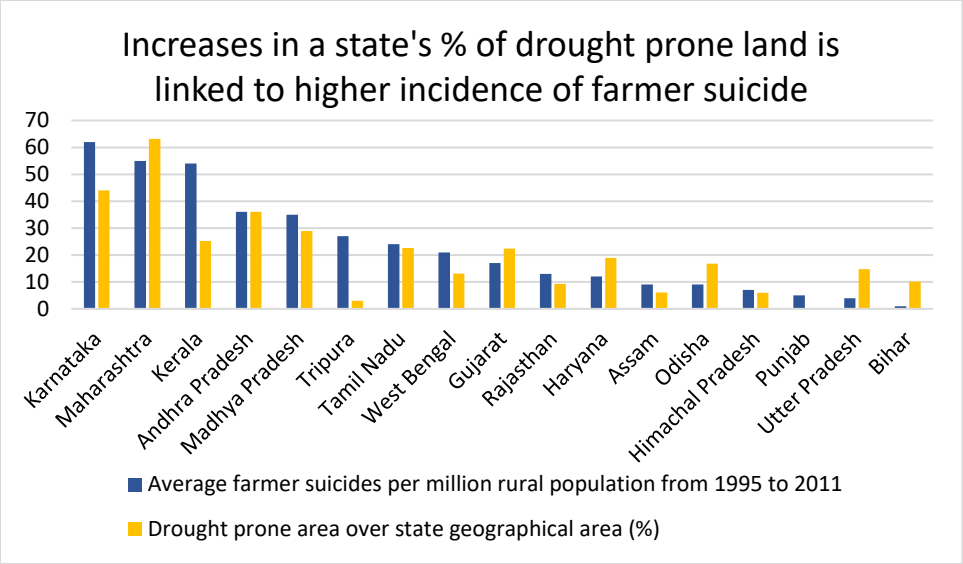

Figure 2: Average number of farmer suicides per million rural population paired with the percentage of drought prone land in 17 major Indian states from 1995-2011 (adapted from Parida et al, 2018).

Climate change's effects on mental health are not limited to those whose livelihoods are jeopardized. All of us are directly impacted as we find ourselves living in rapidly changing environments. Many of the species (polar bears, elephants, penguins, etc.) and environments (tundra, old growth forests, coral reefs, etc.) that we love are in danger. As illustrated by Figure 3, entire coral reefs can bleach in under a month, and die within a year (Eakin et al, 2009). We often need to feel a strong love of place (topophilia) to feel happy with our lives (McShane, 2018). "Valuing attitudes" such as interest, appreciation, and wonder can form quickly but humans require time to grow to love something. As Katie McShane explains, "love is limited by the [temporal] constraints of our human psychologies" (2018). As environments continue to change more rapidly their inhabitants' topophilia is put in jeopardy, turning people into refugees in unfamiliar hometowns.

Figure 3: Images of the same coral reef over a period of 9 months (Seaview Survey, 2015).

One does not even need to physically experience climate change to be psychologically affected by it. Increased awareness of threats posed by climate change causes emotional distress in people who should ostensibly be safe. Popular understanding of the issue is too often gained through sensationalized media coverage (Fritze et al, 2008). This can be colored by an individual's concerns, thoughts, outlook, and social interactions, which all contribute to the resulting emotional response. Two common responses are varying forms of distress and anxiety, while others cope by minimizing or denying the problem. In both cases, this may be the result of being presented with information that is too upsetting or solutions that are too difficult (Fritze et al, 2008). As mentioned at the start of this paper, children and teenagers are especially impacted by climate awareness. It is likely that many children, and adults, are confused about the concept of climate change, and the magnitude of the threat it poses them personally. In response to this, The Australian Psychology Society developed the following advice to help individuals facing climate change related anxiety or depression (APS, 2007). Table 1 provides actionable and realistic goals that put the reader at the center of the issue.

Climate education focusing on the individual has been found help make the issue seem more manageable and reduce emotional distress (Fritze, et al 2008).

Table 1: The Australian Psychology Society's advise for those experiencing "climate related stress"

Climate change: What you can do.

'Although environmental threats are real and can be frightening, remaining in a state of heightened distress is not helpful for ourselves or for others. We generally cope better, and are more effective at making changes, when we are calm and rational.'

- Be optimistic about the future.
- Remind yourself there is a lot you can personally do.
- Change your own behaviour.
- Become informed about problems and solutions.
- Do things in easy stages.
- Identify things that might get in the way of doing things differently.
- Look after yourself!
- Invite others to change.
- Talk with others about environmental problems.
- Present clear but not overwhelming information and offer solutions.
- Talk about changes that you are making in your own life.
- Share your difficulties and rewards.
- Be assertive, not aggressive.
- Congratulate people for being environmentally concerned.
- Model the behaviours that you want others to do.

Aside from combating climate change, mental health education is possibly the best way to minimize its effect on societal wellbeing. According to the World Health Organization, 70% of individuals worldwide do not seek treatment for mental health concerns. This is referred to as the "treatment gap". Minimizing the stigma surrounding mental health reduces shame and encourages help seeking (Crowe et al. 2013). Not only does mental health education in schools accomplish this, but it also equips people with the tools to combat mental and emotional distress (Casañas, et al 2018). Learning to lead a happy life while managing

environmental stressors will be an increasingly essential skill for generations that have to live with climate change.

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