

## Water in the Sahel: A Treasured Resource

According to experts, worldwide crop yields will decrease up to 25% by 2050 due to climate change. This reduction will impact the entire world, but the Sahel region of Africa will be hit especially hard due to various geographic and socioeconomic factors. If given the opportunity to address the negative impacts of climate change on world health, I would promote drip irrigation and other water-saving practices in the Sahel, the wide strip of fertile grassland directly south of the Sahara desert. This would address the problems of malnutrition and lack of food security.

I chose to focus on the Sahel because malnutrition, famine, poverty and lack of healthcare are common there already, and experts predict climate change will have particularly severe impacts. The Sahel consists of parts of Sudan, Chad, Niger, Mali, Mauritania, Ethiopia, Burkina Faso, and Senegal. The most recent human development report from the United Nations listed all eight of these countries as “Low Human Development.” This designation indicates these countries lack resources to adapt to the imminent impacts of climate change. Adding to their vulnerability, as much as 80% of the Sahelian residents depend on agriculture for their livelihood. Furthermore, the Sahel’s population is growing, meaning more people, especially children, are in need of nourishment.

As if the Sahel’s current struggles aren’t enough, climate change is making vital rains in the Sahel less reliable. The major droughts of 2005, 2008, 2010, 2012 and 2018 have been linked to climate change-We are seeing the effects of these droughts already. Approximately 6 million people were severely food insecure in July of 2018. In 2012, one million children were at risk of starvation. Though worse drought is the probably the main impact of climate change on the Sahel, other impacts are gathering like storm clouds on the horizon. Now that Sulfate Aerosol pollution, which indirectly reduces the Sahel’s rainfall, has decreased, we may see more dramatic

(but less frequent) rainstorms which could cause flooding. The particularly unfair aspect of this situation is climate change will be felt hardest here, in an area that did very little to cause it.

The good news is the Sahel has plenty of land and potential to improve food production dramatically. To unleash this potential, farmers need to shift to better, more reliable agriculture practices. Most farmers in the Sahel rely on rain-fed agriculture. When not enough rain falls throughout the growing season, this leads to less food and more poverty for millions of hard-working families. Drip irrigation is a widely-recognized, effective solution. It conserves water, making more crops per drop. Reliably high crop yields mean food security as well as economic development, which leads to better medical care. When farmers have enough crops to sell their surplus, they have more money to get medical help when they are sick. Mando Adaye is a banana farmer in Burkina Faso. In the early 2010s, he was lucky enough to get a drip irrigation system for his banana trees. “I’m satisfied with drip irrigation” he told Peter Hille from Deutsche Welle, a German news organization. Using his drip irrigation system, Adaye has cut his water usage in half since the time he watered his trees with buckets. It is clear that rain is important to food security and general well-being throughout the Sahel, and climate change is putting this vital resource in jeopardy.

Drip irrigation is a practical water conservation method, but communities need a water source to implement it. This could be a nearby body of water, but in rural farming communities far from natural water sources I would work with local organizations to install solar-powered wells to make access to water more reliable. These wells could also provide safe drinking water in places where water is scarce or contaminated. To make a drip irrigation system communities also need a reservoir, irrigation tubing, and a control system. I would make these with local and reused materials whenever possible. For instance, 200 liter drums that were once used to ship

goods can be repurposed to use as irrigation system reservoirs. In addition to installing drip irrigation, I would educate communities on soil structures (contour bunds, trenches, and semi-circle bunds) to slow runoff, retain moisture, and to make the most of the intense rain events that climate change will bring. To help spread these practices further and promote much-needed economic development, I would train and employ local young people to educate neighboring communities.

In summary, water is a scarce but vital resource in the African Sahel, where the majority of the population farms for a living. Climate change will decrease the reliability of rainfall, leading to further food deficit and malnutrition. To help fix this problem, I would spread drip irrigation further throughout the region and educate farmers on how to make the most of rain. As members of one of the countries that did the most to cause climate change, we are obligated to help the people that will be most affected. Helping farmers in the Sahel is a great way to fulfill that obligation.

Works Cited

Climate Reality Project. “The Facts about Climate Change and Drought.” Published June 15, 2016. Accessed 3/18/19. <https://www.climaterealityproject.org/blog/facts-about-climate-change-and-drought>

Hille, Peter. “Drip irrigation in Burkina Faso.” Deutsche Welle. Published March 28, 2013. Accessed 2/20/18. <https://www.dw.com/en/drip-irrigation-in-burkina-faso/a-16703073>

United Nations Development Programme. Lead Author: Selim Jahan. “Human Development Report 2016.” Published March 21, 2017. Accessed 3/20/19. <https://www.undp.org/content/undp/en/home/librarypage/hdr/2016-human-development-report.html>

Food and Agriculture Organization of the United Nations. “Sahel - Response to mitigate the impact of the deteriorating situation.” Published July, 2018. Accessed 3/20/19. <http://www.fao.org/emergencies/resources/documents/resources-detail/en/c/1144917/>

Schoen, John W. “Here’s how US Pollution stacks up with the rest of the world.” CNBC. Published May 31, 2017. Accessed 3/20/19. <https://www.cnbc.com/2017/05/31/how-us-carbon-pollution-compares-with-the-rest-of-the-world.html>

Food and Agriculture Organization of the United Nations. “We only have one Earth. Now is the time to take action.” Published November 14, 2017. [https://www.youtube.com/watch?time\\_continue=73&v=nzFDSmt9zCU](https://www.youtube.com/watch?time_continue=73&v=nzFDSmt9zCU)

Huffington Post. “Sahel Drought 2012: One Million Children at Risk of Starvation.” Published April 5, 2012. Updated December 6, 2017. [https://www.huffingtonpost.com/2012/04/04/sahel-drought-2012\\_n\\_1403884.html](https://www.huffingtonpost.com/2012/04/04/sahel-drought-2012_n_1403884.html)

Farming First. “Drip Irrigation Kits in the Sahel.” SlideShare. Published November 11, 2010. Accessed 3/20/19. <https://www.slideshare.net/FarmingFirst/drip-irrigation-kits-in-the-sahel>

Giannini, Alessandra. “How Pollution and Greenhouse Gases Affect the Climate in the Sahel” Earth Institute, Columbia University. Published March 13, 2019. Accessed 3/20/19. <https://blogs.ei.columbia.edu/2019/03/13/pollution-greenhouse-gases-climate-sahel/>

Riebeek, Holli. “Defining Desertification.” NASA Earth Observatory. Published January 3, 2007. Accessed 3/20/19. <https://earthobservatory.nasa.gov/features/Desertification>

Riebeek, Holli. “Drought in Africa.” NASA Earth Observatory. Published July 15, 2009. Accessed 3/20/19. <https://earthobservatory.nasa.gov/images/39363/drought-in-africa>

NASA Earth Observatory. “The Water Cycle and Climate Change.” Published October 1, 2010. Accessed 3/20/19. <https://earthobservatory.nasa.gov/features/Water/page3.php>

Maishorou, A., Chirwa, P.W., Larwanou, F., Babaloo, F., and Ofeogbu, C. “Sustainable land management practices in the Sahel: review of practices, techniques and technologies for land restoration and strategy for up-scaling” International Forestry Review Vol.17(S3). Published September 2015. Accessed 3/20/19. [http://www.afforum.org/sites/default/files/English/English\\_101.pdf](http://www.afforum.org/sites/default/files/English/English_101.pdf)

World Bank, Africa Region, Sustainable Development. “Transforming Agriculture in the Sahel: What Would it Take?” n.d. Accessed 3/20/19.  
[http://droughtmanagement.info/literature/WB\\_transforming\\_agriculture\\_sahel\\_2013.pdf](http://droughtmanagement.info/literature/WB_transforming_agriculture_sahel_2013.pdf)