

KaeLyn Stephens
Grand Rapids High School
Grand Rapids, Minnesota
Pakistan, Factor 5: Climate Volatility

Pakistan: Climate Change and How It Affects Food Insecurity in Pakistan

Pakistan is a country in South Asia, surrounded by the countries of India to the east, Iran to the southwest, Afghanistan to the northwest, and China to the northeast.



Pakistan also borders the Arabian Sea to the south, yet it is not the only important waterway of Pakistan. One of the most important rivers to Pakistan, as well as to all of South Asia, is the Indus River. The Indus River begins in the Tibetan Himalayas, passes through India, and enters Pakistan and flows through its center to the southwest(Ahmad, O. Lodrick). The Indus River is only a fraction of Pakistan's various and unique landscape; it also contains mountains, valleys, deserts, plains and beaches(summitpost.org).

Pakistan's population was recorded at 199.7 million as of current 2018, and continues to rise each year(WorldoMeters). The average life expectancy in Pakistan is 66.4 years old; quite low mostly due to untreated diseases of the body (WorldHealthRankings). A typical family within Pakistan usually takes part in the joint family system, where grandparents, parents, and children all live in one dwelling. In a typically family, the eldest male—whether it be a grandfather, father, or paternal uncle—is in charge of making the major and most important decisions for the entire family.

A common, daily diet in Pakistan usually consists of some sort of meat or protein, wheat-based products, as well as vegetables and green tea. Typical livestock meats that are commonly eaten in Pakistan are chicken, fish, beef, and lamb, but rarely pork, because it goes against the Muslim religion(Saloom). Pakistan is a major wheat-grower and exporter, as well as a major flour exporter to its neighboring country Afghanistan(Lyddon). Being such a major food source, wheat and flour products are no doubt a part of daily meals. Vegetables are another big part of the daily diet in Pakistan. The most common vegetables cultivated in Pakistan are various beans, beets, broccoli, brussels sprouts, cabbage, carrots, celery, chard, cucumber, and much, much more(Abbas). Green Tea is also very commonly seen in daily diet.

Pakistan's system of education was adopted from colonial authorities, and is considered to be one of the most underdeveloped education systems in the entire world. The first level of education is known as

Primary Education; most people in Pakistan have at the very least primary education. The second level of education in Pakistan's education system is called Middle Education: grades 6-8, which include studies of different languages, science, math, arts, social studies, and technology studies when resources are available. The second level of education is called the Secondary Education, which includes grades 9-12, and is expected to have examinations each year. The fourth level is called Vocational Education, which is "controlled by the Pakistani Technical Education and Vocational Training Authority. This body strives to re-engineer the process in line with national priorities, while raising tutoring and examination standards too"(Classbase). And the fifth and final level of education in Pakistan's educational system is called the Tertiary Education, and only around eight percent of Pakistan students make it to this level. Tertiary education is obtained through higher secondary education grades and certifications. Tertiary education paves the way for entry to college and degrees(Classbase). The more education obtained in Pakistan, the better life could be.

Many things define a good life in Pakistan, one of the biggest things being healthcare. As a whole, most people who live in Pakistan lack access to healthcare, especially those who live in rural areas where they're a greater distance from hospitals and care facilities. One of the biggest issues of being far from hospitals is the threat it poses to women giving birth. Women who live in rural areas give birth with only the help of a midwife or neighbor. As a result from lack of technology and profession, often times the mother or the child can be harmed, or even killed in extreme cases. Pakistan's life expectancy is lower compared to other countries due to the lack of treatment of bodily diseases, which, once again, is caused by lack of access to healthcare(Bhatti).

Agriculture and farming is a major part of Pakistan's way of life. Farms in Pakistan grow many different kinds of crops, ranging from soiled food, to cotten, and to livestock. On average, a farm in Pakistan is usually around 6.4 acres(Food and Agriculture Organization of the United Nations). In Pakistan, there are two main cropping systems based to the north and east. To the north, farmers grow crops, such as orchards, potatoes, wheat, and other vegetables. Crops in Pakistan often vary on the seasons. In the summer months, the most often crops grown are sugarcane, rice, cotton, and corn. In the winter months, crops include wheat oilseed rape, mustard seed, and barley. Also in the North is the Indian rice-wheat belt that reaches all the way across Pakistan from west to east. Farmers most commonly use the Indus River and Arabian Sea delta as water sources for their crops. To the West, farmers raise livestock such as goats, cattle, sheep, horses, and chickens. The only agricultural these farmers tend to are smaller-scale areas of fodder crops for their animals(New Agriculturalist). Current farm practices in the country of Pakistan consist of the use of more sustainable fertilizers for growing crops(Khaskheli).

The factor of food insecurity in Pakistan that I chose to look into was climate volatility, or climate change, in other words. Climate change is one of the biggest threats to Pakistan, because its climate and temperatures have raised due to global warming, which has had negative effects on crops and agriculture through droughts and flooding(Nazar). Pakistan's current change in climate has left crops and agriculture damaged through lack of water, as well as excessive amounts of water, and heavy rains that no longer have a particular season or schedule. Under these conditions, food has become more difficult to provide and cultivate, and is leading to food insecurity in Pakistan.

The present status of climate change in Pakistan is global warming has changed Pakistan's climate to inconsistent and unpredictable. Droughts have been drying all types of land areas to the point where they are pointless to farm, like in Thar and Balochistan(Nazar). Global warming has also caused a large amount of flooding in Pakistan. This flooding comes from the melting of glaciers, heavy, inconsistent

rains with no season, and the rising sea level of the Arabian Sea due to the flooding the Indus River Delta(Nazar). This flooding has increased in frequency in the past five years, and have caused major damage to the farming environment.

Climate change and global warming has affected everyone in Pakistan, even the typical family. Due to an average family in Pakistan being larger compared to others, each family needs more food to be able to feed everyone. This is why farming and agriculture are so important to Pakistan and its people; it is a necessity to live and thrive. Mentioned previously, the climate conditions have worsened over the past five years, yet Pakistan's government hesitates to take on such a big issue as climate change and global warming, and "much like the government, the Pakistani public finds it difficult to prioritize climate change when the average citizen is deprived of life's most basic necessities"(Nazar). So much focus has gone into providing families in Pakistan with other necessities, that the country as whole failed to look into the long-term effects of changing climate and global warming.

Climate change and the effects of global warming in Pakistan have worsened over the past five years, yet it is hard to say if that trend is continuing to worsen or get better. That being said, there are some new, major issues that are being faced in the country. Mentioned previously, the changing climate has caused heavy, inconsistent rains, and global warming has caused glaciers to melt; both creating serious flooding. This flooding has a worrisome effect on the Arabian Sea and the Indus River Delta by raising their sea levels. This is a major issue, because the city of Karachi, which is considered to be the "economic backbone" of Pakistan, is near and threatened by these rising bodies of water(Nazar).

Climate change is an important factor in Pakistan's food security, yet it's not in the favor of the issue. It is important that Pakistan learns food strategies to deal with its changing climate, because global warming has changed it for good, and it won't be able to provide for itself if it does not. Global warming has changed climate for the long run in Pakistan, and with another issue of a rapidly growing population, it is important that the country gains control and adjusts agriculture to the new, changing climate to be able to provide food for all.

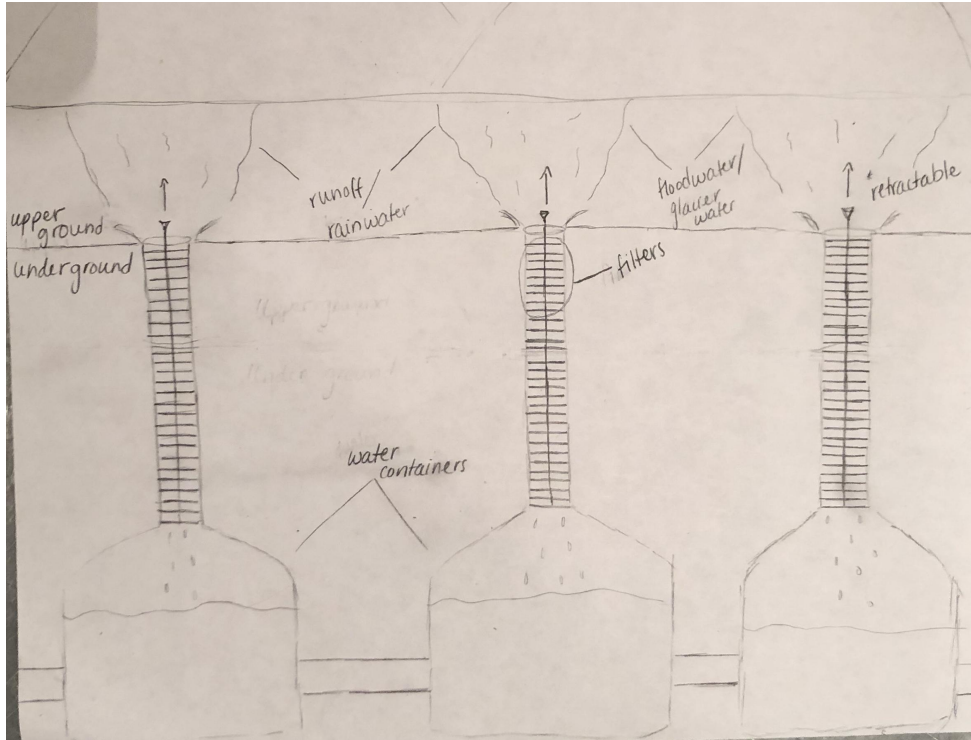
I have come up with three possible solutions to decrease food insecurity in Pakistan. My solutions focus on working with the changing climate of Pakistan, rather than trying to make a difference in global warming. I think that this is important, because global warming cannot be reversed. The Earth's ozone layer will not grow back from its destruction and damage, so countries, like Pakistan, have to deal with the current situation of a changing climate, and learn how to survive and live in harmony with it.

Global warming has changed Pakistan's climate in three major ways. It has made its climate more prone to droughts, more prone to floods and flooding, as well as more prone to inconsistent amounts and timing of heavy rainfall; all of which are major threats to Pakistan farms, crops, and agriculture. My first solution is to ship Pakistan seeds of crops that don't require great amounts of water, and that can be grown in droughts and warmer climates. Some examples of these crops include: Yellow Pear Tomatoes, Lima Beans, Lemon Cucumber, Roma Tomatoes, Cocozelle Zucchini, Yard Long Asparagus Beans, New Zealand Spinach, Pole Beans, Eggplant, Poblano Peppers, Jalapeño Peppers, Snap Beans, Cantaloupe, Sugar Baby Watermelon, and so much more(SeedsNow). The Islamic Relief USA(irusa.org) program is a possible sponsor for this action, because they are already helping taking donations for orphan support and

sponsorship in Pakistan, and would possibly be interested in decreasing food security for those orphans and the overall people of Pakistan. The seeds themselves can be brought to Pakistan in any way of transportation, as long as they stay dry and cool, which is easy to accomplish with some non-harmful bags and coolers or fridges. With the harvesting of these crops in the dry parts of Pakistan's changing climate in combination with its work with more sustainable fertilizers, more food will be available in drought prone areas, creating a decrease in food insecurity.

My second solution is similar to my last solution, except for providing crop seeds that survive in droughts, crop seeds that can survive and thrive in flooded areas are provided and shipped to Pakistan. Unlike the drought crop seeds, there is not a large variety of these types of flood crop seeds, but some examples are Wild Rice and Asparagus(SeedsNow). Since the change in climate and global warming have melted glaciers, raised sea levels, and created unpredictable, heavy rainfall, there are many areas in Pakistan that are prime for these types of crops. Once again, this action could as well be sponsored by The Islamic Relief USA, because they are very interested in aiding the people in Pakistan, especially the kids who do not have families, in any way they possibly can. These crop seeds can also be delivered to Pakistan in almost anyway; rather it be by aircraft, ships, or drones. As long as they stay cool and dry, the seeds will remain healthy through the entire delivery trip.

My third and final solution is my own idea of rainfall and floodwater collection, that could be sponsored by the United Nations Development Program and the Pakistan Council of Research for Water Resources, who have taken a chance on similar actions in 2010(Walton). This idea will both benefit the areas in Pakistan with drought and flood prone climates. It would be large containers placed deep within the ground, similar to wells. These containers are the holders of the clean and filtered water. There will be pipes that lead down to these containers, and within these pipes will be many different types of filters for the water to extract the dirt and mud particles. These filters will be retractable from the pipes, so that they may be cleaned from build up of mud and other filtered particles. These filters will also vary in pore sizes. The filters will start with large pores on top, and the smallest on the bottom; the filter pores will shrink the closer the water gets to the underground containers to ensure the water is as clean as possible. Now, all of these containers will be connected across the country through pipes, so that everyone has access to clean water for drinking, cleaning, and even farming. These containers will be placed mostly in flood prone areas in locations where water tends to drain to and build up. The main idea of these containers is to collect floodwater from heavy rainfall, melting glaciers, and rising sea levels and distribute it to where it is most needed in its safest form. By doing this, harmful flood water is being removed from certain areas, as well as providing safe water to other areas of Pakistan that are prone to drought due to the changing climate at the same time.



This is a simple sketch I did of my idea. In reality, the containers would be more of a distance apart. They will be placed in trenches, natural or man made, so that as much water is collected as possible. This water will be stored or welled later for uses of agriculture and farming, as well as for livestock. The state of California in the United States of America has also considered an idea similar to this to help with allocating their water. This idea also included the digging of tunnels to send water to different parts of the state. This idea is supposed to help out farmers and save time, money, and overall energy. The digging of the tunnels in California's plan will cost over 17 billion dollars, and that's only for one state (The Sacramento Bee). Pakistan is almost 3 times the size of California, so this construction will cost around 3 times as much, not including the water-collecting containers themselves. This idea is a solution to food insecurity in Pakistan through the fact that water is being provided to places of severe climate change; drier areas that are prone to droughts. This idea is also helping rid areas of flooding so that they can possibly be cultivated for food as well.

In doing this World Food Prize Project, I have learned so much about the country Pakistan as a whole, and how much a simple change in climate can affect an entire country's way of life. Changes in Pakistan's climate have made areas of the country more prone to droughts and flooding, as well as inconstant rains; creating food insecurity. I think that by providing new crops that can take on these new and more harsh climates, and collect floodwater and rainfall to reduce flooding and provide to dryer areas, more food can be provided for the entire country.

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