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India, Factor 6: Climate Volatility

India: Adversity in the Growing Season

Despite India having over one-half of its land be suitable for farming, its weather conditions do not always seem to comply. (Central Intelligence Agency. Web). India is one of the few regions of the world that is forced to undergo Monsoon. Monsoon is a seasonal mixture of wind and rain that is sourced from the Indian Ocean. It typically runs from June through September. The erratic weather patterns of Monsoon often disadvantage India's agricultural economy and water supply. (Krishnamurti, 2009). It is either a blessing or a burden to Indian farmers because it is their main source of water for agriculture. Furthermore, they have to adapt to its harsh conditions in order to produce enough food. Lately however, scientists have stated that simulations of India's future climate patterns extensively suggest a five to ten percentage increase of overall rainfall for the next 50 years. (Royal Meteorological Society. Web). This may not seem like much, but it will result in many floods and droughts within the region. It is imperative that we propose a solution which reduces the scarcity of water that India will undergo in the next few decades. This is a great disadvantage not only to Indian farmers, but also its entire population.

Geography and Population

India is located in southern Asia between the countries of Burma and Pakistan. It borders the Arabian Sea and the Bay of Bengal. India's northern terrain is primarily mountainous while its southern terrain is mostly plains. Similar to its differing geography, India's climate is both temperate and tropical. Its population is approximately 1,266,883,598 people; seventy-two percent of which are Indo-Aryan. (Central Intelligence Agency. Web). Life in India is quite diverse. It is composed of a variety of ethnicities, religions and classes. Most of society still follows the caste system despite it being outlawed in the 1990's. India is still a very hierarchical society. No matter if one is Hindu, Buddhist or Muslim, they are identified as one of the following: above poverty or below poverty. (AsiaSociety. Web). As of 2012, twenty-nine percent of India's population live below the poverty line. (Central Intelligence Agency. Web). Twenty percent of its people live in the cities; 600,000 villages contain the other eighty percent in rural India. In these villages, lie many generations of farmers and their families. (AsiaSociety. Web).

Families in India

Nearly all families in India express the importance of having high values; the priority of their own bloodline is unquestionable. The average number of family members per household is about four to five people; most of which includes married parents and their children. "*Large families tend to be more flexible and well-suited to modern Indian life, especially for the more than two-thirds who are involved in agriculture.*" (AsiaSociety. Web). The type of diet these families have is varied among their location and religion. The average number of calories consumed per capita is two-thousand three hundred. In northern India, it is very common to eat flatbread during meals, while in southern India most families consume rice. Due to religious beliefs, many Hindus and Buddhists are vegetarian, therefore they do not eat beef. Additionally, most Muslims do not consume pork. However, adding spice to food is very popular among all groups. Some of the most commonly used spices are: chili pepper, garlic, cardamom,

ginger and cinnamon. While we in America take our microwave ovens and stoves for granted, rural Indian families still use cow dung as fuel to cook their food. (Food in Every Country. Web).

Furthermore, about twenty-two percent of Indians are classified as un nourished; fifty-three percent of children under the age of five are considered underweight. (World Food Bank. Web). More than half of all children in India have stunted growth as a result of malnutrition. (Food in Every Country. Web). The majority of kids who belong to impoverished families oftentimes spend their whole days working or begging for food. Although, India's government has attempted to secure a sufficient healthcare and social welfare system to benefit and provide food for those under the poverty line. *"In a move intended to help the hundreds of millions of Indians whose lives are scarred by malnutrition and hunger, the Congress party-led government has passed a £13bn scheme to provide heavily subsidised wheat, rice and cereals to the very poor."* Since the 1960's, India's government has provided its schools' free lunchtime meals in order to encourage poor families to send their children. (The Independent. Web). There is a very small percentage of India's youth who do not suffer in this manner and are able to receive a standard education.

Education

School in India has four levels and they include: lower primary, upper primary, high and higher secondary. Each state in India provides its own school funding and education curriculum. Students who have the advantage to go to school are required to receive education on this curriculum until the end of high school. Both boys and girls go to school for about 12 years on average. (Central Intelligence Agency. Web). Similar to the education system of most other countries, Indian children must pass a national, standardized test in order to receive admission to a higher learning facility. They are presented with these tests in the tenth and twelfth grades. (Kumar, Sasi V. Education in India. Web). These tests assess their knowledge over everything they have learned. If they perform well, they have the opportunity to expand their learning in college.

Access to health care

The available access of health care to Indian people varies among region. Most rural villages fall short of accessible physicians and hospitals. Its cities however hold private medical centers that have access to some of the best medical care in the world. Most of the wealthy rely on these private hospitals for their medical treatment. Moreover, the impoverished people are underprivileged in this situation. India's state governments try to provide health care services to the poor at a lower cost, but most people lack the money and resources needed to receive these treatments. (International Student Insurance. Web). This is a major issue of Indian society and there should be a method as to distribute health care to all of its population.

Typical Farm

The average farm size of India is equal to 1.42 ha or three and a half acres. The types of crops produced include: rice, cotton, tea, rubber, sugarcane and tobacco. (General Knowledge. Web). The kinds of livestock that are raised include cattle, buffalo, sheep and goats. Most Indian farmers do not raise these animals for food because it is against the Hindu religion. There are four major types of farming that takes place in India. They include subsistence, organic, commercial and industrial farming. These four vary among region, but the most commonly used to adapt to Monsoon is subsistence farming. It occurs mainly in India's larger regions; it is most commonly practiced in southwest India. A subsistence farm provides

just for the farmer and his family. Most of the time, these families struggle the most in having to deal with the unpredictable weather patterns of Monsoon. Similar to the practices of an organic farmer, subsistence farmers use an environmental approach to fertilizing crops and removing pesticides. Although, organic farms make up a small percentage of India's agricultural economy, they are the fastest spreading among region and are increasing in popularity. Some of the practices of organic farming include: nitrogen fixation, crop rotation and expanding the use of more natural ingredients such as manure for fertilizer. (Agriculture in India. Web). Most Indians who switch to organic farming find it easier to manage and discover a greater sense of purpose in life. Additionally, another kind of farming used in India is industrial. India's industrial farms mostly consist of the raising of cattle and goats for their milk. They also produce major crops in abundance such as sugarcane and wheat. Like industrial farming, there is also commercial farming. Commercial farming in India takes care of feeding the population. They raise their important market crops and animals to send off and trade within their borders and internationally. Commercial farming makes up about seventeen percent of India's total gross domestic product. (World Food Bank. Web). It includes the raising of crops such as wheat, sugarcane, corn, tea and rubber. (Aquaponics in India. Web). The kinds of agricultural practices all four of these share are: irrigation farming, shifting cultivation and crop rotation. (Aquaponics in India. Web). These methods are essential to the production of India's agriculture and adaptation to India's climate.

Major Barriers

The typical farm family affected is likely to belong to a subsistence or commercial farm. This is because geographically, India's most arable land is targeted by Monsoon weather. Therefore, these kinds of farmers are forced to undergo irregular patterns of rain and wind for the time being. Most of these farmers reside in rural villages located in southwest India. (Royal Meteorological Society. Web). The conflicts that these farmers face includes: floods, droughts, the damaging of crops and livestock, hydroelectric shortages and even loss of life. In order for India's people to have access to food markets and adequate nutrition there must be a solution as to reduce the risks involved with farming against Monsoon. There are no sufficient farm techniques discovered yet that will completely protect the crops. If farmers cannot produce enough for themselves and their families, the population will be forced to endure starvation. If farmers lose the crops that they have worked so hard for all season, they will gradually lose income. To overcome the financial adversity presented to these families is crucial. There must be a self-sustaining form of income. In order for this occur, I propose that major organizations such as UNICEF or The World Food Programme- should provide grants to small communities like these, and overtime, these farmers can repay them with how much they produce. Additionally, I propose that the Indian Government should follow this same procedure, so in turn, that these villages can give back to the administration in which provides for them. Overall, these barriers as to improving the agricultural productivity of these farms are conflicting. (CarbonBrief. Web). It is evident that humans cannot control Earth's atmospheric conditions, but we can look towards reducing our carbon emissions and make sure to be storing as much water as possible for the dry seasons to come.

Climate Volatility

Climate Volatility is a very important issue pertaining to all Asian countries affected by Monsoon. India however, has been undergoing too many foot shortages over the last couple of centuries. With its population steadily increasing, it is imperative to find means to prevent this from happening. Climate Volatility is very connected with India. It is a fact that Monsoon season is getting worse with its sparse

tendencies. As of now, there are a number of organizations and research teams established to try and ease the consequences of this weather, but we will never be capable of eliminating it permanently. These organizations include: India's National Research Development Corporation (NRDC), India's Network on Ethics and Climate Change (INECC) and India's Youth Climate Network (IYCN). India's sporadic climate changes the lives of its whole population, but more specifically, it can greatly burden the typical family of India. (Climate and Energy. Web). A stable climate for India is essential to agricultural productivity. Without seasonal rain and constant temperatures, most farmers will face crop failure. Crop failure then leads to food shortages and starvation. This family will not be able to receive the necessary nutrition from their food to live securely. If this family owns a farm, they will lose their income as easily as they lose their crops. According to meteorologist, Dr. Andrew Turner, as carbon emissions increase, so will average rainfall and temperature. The average Indian farmer needs about 700,000 gallons of water to sustain his crop growth in one year. This varies on size of region.

Carbon Footprint

Scientific researchers have proven a correlation between the greenhouse effect and Monsoon season. Projections show a connection between added carbon emissions and the amount of rainwater collected over the last century. If the population can attempt to reduce the amount of carbon emissions they produce, there may be hope as to easing these climatic problems. From data over time, scientists have verified many effects of our increased carbon footprint. Some organizations that promote this stance are The United Nations Environment Programme (UNEP) and The Intergovernmental Panel on Climate Change (IPCC). These include: an increase in sea level, increase in sea surface temperature and a change in precipitation. (Carbon Footprint. Web).

Solution

The number of obstacles that Monsoon brings to India's people and environment is far too great. India's issue with Climate Volatility demands a solution that enables its people from undergoing more food shortages and environmental damage. It is a given that we as humans cannot control the weather, but we can make an effort towards finding a solution. One way of easing India's climate burdens is to start reducing our carbon output. Scientists from the Environmental Protection Agency organization state that as carbon emissions increase in Earth's atmosphere, so will temperature and rainfall over time. (Environmental Protection Agency. Web). As a society, we need to band together and efficiently work to reduce the amount of emissions we put into the air. Instead of burning fossil fuels, we can find more environmentally friendly ways of performing daily tasks. For example, instead of driving, we can walk or bike. Although, we may have no information as to how long a drought may last, there can be established methods of resource availability for the regions affected. This needed resource is water. If we can create a collection and distribution system for India's water shortages, it would reduce many of the problems India faces with its agricultural economy. Currently, there are a few organizations who are working towards fixing this problem. One of them includes the Watershed Organization Trust of India, (WOTR). Their purpose is to protect the people living in these regions and also establish better infrastructure for water collection. I propose a similar idea. I suggest that India's local governments should be assigned to the construction of the distribution system. This infrastructure would be similar to the collecting and transferring process of a pipeline; additionally, it would be used to store water during the rainy seasons and distribute it to farmers during the dry ones. Its whole functioning process would be similar to the way an energy company works in North America, but instead of energy distribution, it will be water. The

state and local governments in India would partner with its own organizations such as the WOTR, and this would enable an availability to the resources needed to make a change with this issue. Farm families and rest of the population living in these regions can pay a small percentage tax that will go towards the maintenance of this infrastructure. Overall, this plan would improve the issue of food security in India because it would initiate an irrigation plan for farmers and their crops when Monsoon is drastically changing. As a final thought, the usage of advanced technology could be of a huge advantage to these rural communities. They just need the necessary money, time and energy to retrieve this technology from overseas. For example, a team of scientists from the Massachusetts Institute of Technology (MIT), just created a new solar powered device that collects water from the air and produces it as drinking water. They have even tested it in desert environments and conditions. With new advancements like this, along with the ability to bring light to these ideas with social media, the world could very well be revolutionized. It is our job as the generation to come- to make sure and follow through with new creations such as this and promote it worldwide, so that others are informed. In closing, we may not be able to change Monsoon's patterns, but we can change our ability to help those affected and who are in need of help, especially when the weather does not want to comply.

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