A Shifting Economy

The Effect of Climate Change on the Agriculture Industry in India and how it is shifting

Agriculture is "One of the most important sectors of the Indian economy" as "more than 50% of the total population of the country is still dependent on" it (Sharma, par 7). But the rise and effect of climate change has already started to impact food production, the availability of water and the lives of many farmers in rural areas. When I went to India in 2022, I learned that many farmers use rain-fed agricultural techniques to grow their crops and rely on monsoon rains, but irregular monsoon season caused by climate change, long droughts and floods make farming very difficult. The decrease in food production is credited to the increased temperatures and unusual precipitation, which disrupt the growth cycles of the crops which in turn harms the consumers due to food shortages. The Indian Council of Agricultural Research (ICAR) advised that "the country's annual wheat output could plunge by 4-5 million tonnes with every 1 degree Celsius rise in temperature" (Singh 17). Additionally, in my trip to India, I learned that the warm temperatures cause an increase in humidity which allow for pest infestations which in turn allows for the spread of plant disease and low food production. By not creating solutions to climate change or at least coming up with potential plans to these issues will damage the agricultural economy in which so many people are reliant leading to a shift to other industries.

The increased limited access to water is another factor that effects India's agriculture economy. I learned from local farmers that besides monsoon rains, groundwater from underground aquifers is the next common source for irrigating plants. However, "growers in parts of the country are already starting to exhaust aquifers" (Zhong par 3). The over extraction of the underground water for irrigation has increased in recent years due to the increase in rate of change of climate change and evaporation. In an article published by the Hindustan Times, "In two decades, northern India has lost around 450 cubic kilometres of groundwater, with the depletion rate only to be much faster due to climate change" (Desk par 1). They also claim that "the amount of water lost from 2001 to 2021 is 37 times the full capacity of India's largest reservoir" (Desk par 1). The tremendous amount of water lost is a huge loss as what was lost could've been vital for thousands and even millions of people around the country. Besides the overexploitation in inner parts of the country, the coastal parts have faced challenges regarding saltwater as it reduces the nutrients and minerals found in soil for the plants which affect the production of crops. Though many point towards industrialization and urbanization as a root cause of water scarcity due to the pollution making it unsafe to drink, it should be actually pointed towards climate change as it causes "irregular rainfall patterns and affecting[s] the recharge of rivers and aquifers" (Das par 2).

Extreme weather such as cyclones, heatwaves and unseasonal rainfall have become frequent and a rising problem. Researchers and Cambridge and Yale Universities claimed that "The extreme heat waves experienced in India in 2022 impacted 90 per cent of the population,

increasing the risk of food insecurity, economic damage and premature deaths" (Cavallito 1). The long-term effects of heatwaves do not only damage the crops and production but also reduce the moisture in the soil, making it harder to farm sustainably in already affected areas. Unseasonal rainfall caused by climate change has led to many damaging floods in many areas, though most people think it causes property damage, it also damages the land and soil around it. The rising temperatures and unseasonal rainfall lead to soil erosion which reduces soil fertility. These challenges create a significant issue to food production and economic stability for millions of people.

To combat the already damaging effects of climate change, multiple approaches are needed to address the multitude of effects it causes. The first policy is to increase access to education that aligns with UN SDG 4. Many farmers come from rural, underdeveloped areas with limited access to technology and education. Implementing this would increase awareness of climate change, the overextraction of resources and learn about better ways to farm sustainably. The next policy is to fight pollution that aligns with UN SDG 14 and 15. India is one of the most polluted countries in the world, many of the garbage thrown away ends up in bodies of water or land which then end up in their food. It is claimed that "around 70% of surface water in India is unfit for consumption" and that "Every day, almost 40 million litres of wastewater enters rivers and other water bodies" (Hirani par 2). Implementing this will lead to better standards of living as waste collection and process centers will be able to collect and process the waste instead of being thrown into nature. The implementation of these policies can help fight more than climate change. If implemented correctly, the education policy contributes to building sustainable cities and communities which then affect industry/infrastructure, economic growth and no poverty (UN). If the pollution policy is implemented correctly, it will affect life below water and on land, good health and well-being, zero hunger, clean water and sanitation and responsible consumption and production. And all of this affects climate change. In trying to work towards one problem, climate change, India can solve a multitude of problems they never knew they were solving. However, these solutions are a "band-aid" to a very big wound, the creation and passing of these bills will take time, effort, dedication and contribution of many to solve and "eradicate" these issues. For now, these potential policies create stability and hope for the lives of the millions of farmers there.

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