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India: Food Security

The United States is one of the most developed countries in the world. Often there are many things that Americans take for granted like clean drinkable running water and plumbing, many countries like India do not have these privileges. India has a very large and fast-growing population, making food access scarce in some urban regions. The average Indian family has an income of fewer than 500 dollars a month for a five-person family. Where we live is the breadbasket of the world and does not face severe food insecurity even with population growth, we have enough resources to feed millions of people so why don't we?

1. Life in India

In many places around the world, population increases are negatively affecting as well as redefining what we know to be food security. India, a densely populated country located in Mideast Asia has one of the largest population rates in the world with a whopping 1.38 billion people compared to the United States with 329.5 million. The majority of India's population resides in densely populated cities with little access to farm-fresh food. The markets do have fresh food like fruits and vegetables but they are rather expensive and are not accessible to lower-income households. India has a parliamentary government, this kind of government is led by a group of people (parliament) and that group then appoints one person to be chancellor.

In 2018, 60.43% of the land is cultivated according to the World Bank collection of development indicators; according to downtoearth.org only 19.9% of 2020 of cultivated land is being used for agricultural purposes, this is a full 2% increase from 2018-to 2019. India's largest exports in 2019 are Basmati rice, carabeef/beef, cotton, refined sugar, frozen shrimp, and prawns. The Indian climate is very intense in the summertime with the heat getting up to 41 degrees Celsius (106 degrees Fahrenheit) the lowest it may get is 29 degrees Celsius (84 degrees Fahrenheit). The winter months are less excruciating with the warmest being 29 degrees Celsius (84 degrees Fahrenheit) and the coldest being twelve degrees Celceis (fifty-four degrees Fahrenheit). India is located in the midwest region of Asia and it is the largest country in Asia.

The average size Indian family is four to five people, on average only one member of the family works with an average income of three hundred and ninety-two dollars a month. Home square footage depends on the area, in more urban areas the average home is 449 square feet, in rural areas the average square footage for a home is about 500 square feet. The most common forms of employment in India are in the agriculture and manufacturing industries. All citizens of India have access to free inpatient, and outpatient care, including hospital stays medication, and regular doctor visits. India has a poor education system; upwards of thirty-five million children ages six to fourteen do not attend school, and fifty-three percent of girls ages five to nine are completely illiterate.

There are some things that we take for granted in the United States that are not common in other countries including India. In India, less than fifty percent of people have access to safely managed and reliable drinking water. Plumbing seems like a common thing that we use daily, it is something we often overlook but is a privilege; eighty percent of Indian households do not have indoor plumbing. Only eighty-eight

percent of the Indian population has access to main grid electricity means they do not have access to a reliable power source. Average life in India is far less than luxurious with a lack of living space, a reliable water source, and many other things that are common in a lot of other countries around the world.

Life in India has its trials and tribulations, and the issues will continue to worsen if not properly handled. The water quality will continue to worsen if the pollution from manufacturing continues to enter the waterways. There is little access to indoor plumbing worsening Hygiene habits and increasing the spread of infection and disease. Lower-income households tend to suffer more from malnutrition and a lack of reliable food. Working conditions are not necessarily safe or fair for the workers, most occupations have their employees work more than sixteen hours a day. The daily life of Indian citizens negatively affects food security.

2. Food insecurity in India

India's population is constantly growing, making the urbanization rates increase while losing farmland so less food is growing to feed the population. 194.4 million Indian citizens are undernourished and the number is ever increasing. With population growth, more houses and apartment buildings are being constructed reducing the amount of cultivated land. With less farmland, there will not be enough room for livestock and proper crop rotation. The issue is continuously worsening as the population continues to grow.

India is a very large manufacturing country, it is a very large producer of merchandise and clothing for fast fashion companies, with the high production rate there is air pollution that is also affecting food sources and their reliability. There is also pollution from transportation and agriculture, not just manufacturing, worsening air quality and affecting greenhouse production and livestock production. The increased population rates will produce more pollution overall decreasing food yield with an increasing population, therefore causing an increase in undernourishment and malnourishment. So why is population the issue you may be asking, why not just prevent further pollution by finding new ways to manufacture; that is just not feasible, people with children need to work to provide for their children. Indian citizens will take any job they can get to put food on the table. Many other things affect food security, not just population, there is soil quality, water quality, air quality, and sun exposure.

Water quality plays a big factor in India's food insecurity, fresh water is used for drinking, cooking, and most importantly food production. If water that is used for agriculture contains an excessive amount of nutrients it can harm or benefit plant production, for example, if the water that is used for corn has an excess of phosphorus it can harm the plant rather than help it because corn needs a high amount of nitrates to grow properly. Though all plants need nitrogen, phosphorus, and potassium to grow an overabundance or a lack of an element can affect the growth, unclean water can cause one to overpower. There is also an issue with sun exposure, all vegetation needs sunlight for photosynthesis but if plants are exposed to too much sun it can kill the plants or keep them from growing to their full potential. An overabundance of sunlight in India makes it hard for certain plants to grow. Though India is a largely agricultural country the amount of food produced is not increasing to match the population.

India is an agricultural country but only uses sixteen percent of its land for food production, this can lead to soil problems like a lack of nutrients. In Ohio, farmers use crop rotation to keep the soil healthy. They do this by swapping corn and soybeans, corn depletes the soil of nitrogen, and soybeans replace that nitrogen. With such a small amount of land being used for agriculture in India they may face issues with soil quality reducing the amount of crop growth, but soil quality may also be why the land use is not

increasing. The other land may possibly be unusable for crops because it lacks vital nutrients. If the soil lacks the nutrients needed to grow crops the farmers could use replacements for nutrients to increase the land used and produce more food for the ever-growing population. Though all of these different things pose significant issues with food security there are solutions.

3. Solutions

Like many other big cities, apartment complexes and buildings in India may have plant beds for decoration and aesthetics. Instead of using these patches for aesthetic and decorative reasons why not give them a purpose by converting the beds into community gardens? Implementing community gardens can provide fresh fruits and vegetables for the surrounding residents. Community gardens can also teach younger people responsibility and how to live sustainably to not fall into food insecurity. There are many ways that community gardens can be implemented, and the local government can implement them in their area. Funding should not be a large issue as a large community garden is an investment that gives right back in the form of food. The initial investment for the gardens could be paid for by the community if all the residents in the community pitched in it would not be severely expensive. If the gardens are properly maintained they can last for many years. Although the gardens could help the community it has their issues.

There are potential issues with this solution, like water access and soil quality. The soil in the areas where the garden could be put may lack vital nutrients that are crucial for the plants to grow and thrive. The plants may also be affected by sunlight exposure, the areas may be in direct sunlight, basically cooking the plants as they grow or it can be the exact opposite depending on where the garden is located, without proper sun exposure photosynthesis can not happen. There are certain plants that can not be overly exposed to sunlight or they will not grow. It is the same premise as human overeating. Community gardens have their downsides but soil quality is not a worry when it comes to aquaculture.

Though the first solution is very simple and accessible there are other solutions like aquaculture. Aquaculture is raising fish and other sea life for the purpose of food production. Introducing aqua culture into India can generate more monetary value to the city or state where it is located. Aquaculture will provide a stable protein source reducing malnutrition. Using aquaculture in a community can also advance education, as well as food sources introducing this system, which can educate the ones who manage the system. This system will protect wild sea life in the coastal areas of India. Aquaculture can also be implemented in landlocked areas of India, not just in the coastal cities of India. Though aquaculture would work theoretically but just like any other good idea it has its downsides.

Aquaculture has its negatives as well as its positives, one of the issues with aquaculture is the funding, introducing aquaculture into India is an expensive endeavor, but the agriculture industry would most likely provide funding as Aquaculture is a form of food production. Another concern with aquaculture is placement and where it will go, will plants be set up in more urban areas or rural areas, more urban areas have cleaner water, making it a more efficient choice. Urban areas would also work better because of energy reliability and access. Management can also pose an issue as the workers would need to be educated on how to properly work and care for the system, and there would need to be an outside source to help with the introduction of aquaculture.

The best solution would be the community gardens, as they provide a stable food source for the surrounding residents without a need for extensive funding or training. Aquaponics is a great option for

more developed economies, to implement it in India would be a large challenge because of funding space and employment. Community gardens will still take up space but will not need a lot of funding to get started. Community gardens can be cared for and used by anyone and they assure a fresh food source for anyone in the area.

Life in India has its challenges from a lack of fresh food sources to little access to drinking water. Some Indian homes do not have indoor plumbing or mainstream electricity. India is a large agricultural and manufacturing country, those industries make up most of the employment in the country. Only sixteen percent of the land is used for agricultural purposes even though it is one of the largest industries. There is severe food insecurity in India but there are solutions to this problem, like aquaculture and community gardens. Though aquaculture is a very helpful and reliable resource it is expensive and complicated, it is currently not feasible for the country of India. Community gardens are a great way to introduce fresh reliable food to the surrounding citizens at little cost and minimal complications.

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