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Myanmar: The Volatile Lack of Food

Myanmar has a total population of 54,806,013, of that population, 70% resides in rural areas and 30% in urban areas (Worldometer, 2020). It has been governed in several different ways since it gained independence in 1948. The first civilian general election was in 2020, five years after an election that restricted most people from voting. Before the 2015 elections, Myanmar was a parliamentary republic, meaning the Cabinet heads carried out the laws for Myanmar that were laid out by Parliament. Myanmar was a parliamentary republic until 2008 when it was divided into legislative, executive, and judicial branches under the new government Constitution. The legislative branch is split between the national and local levels. The national level is then further split between two houses, the House of Nationalities and the House of Representatives which is controlled by the Assembly of the Union. The executive branch is powered by the President of the country. The President must oversee the work of the Cabinets and put any rules and regulations in place of which the legislative branch established. The judicial branch is the courts, the highest court Myanmar has is the Supreme Court. The judicial branch does not guarantee the citizens of Myanmar a public trial and is not an independent branch of the government. (Pariona, 2017) Then in 2010, parliamentary elections were held, two military-run parties won the election, the Development Party and the Union Solitary. Finally in 2015 and 2020, with a majority vote in both houses of Parliament, the National League of Democracy won. The National League of Democracy will hold office until the next election in five years. (The Myanmar Times, 2021) & (World Atlas, 2017)

About 19.54% of Myanmar's land is currently cultivated according to a 2016 study. (Trading Economics, 2016) There are about 20 million acres of agricultural land in Myanmar (Oxford Institute of Population Ageing, 2017) On average in Myanmar, a farm is about 2.5 hectares or 4.5 American football fields. which is considered pretty big compared to other Southeast Asian farms. Myanmar's major crops are rice (paddy), sugar cane, and dry beans. Rice has consistently been Myanmar's head crop and continues to grow - in 2018 rice had a production value of 25 million tons. (Moore, 2020) While Myanmar has several major exports, there are three main commodity groups: paddy, oil crops, and pulses. (JIRCAS, 2014) Myanmar imports include fuel, vegetable oil, wheat, and most everyday products such as construction equipment and machinery. (Trading Economics, 2020)

Myanmar has complex geography in terms of climate. In some areas, too little rainfall is received, while in others too much rainfall is received. Myanmar is bordered on all four sides. On the west, it is bordered by the Bay of Bengal, Bangladesh, and India. On the south, it is bordered by the Andaman Sea and again the Bay of Bengal. To the north is the Tibet Autonomous Region of China. Finally, on the east, it is bordered by Laos, China, and Thailand. Myanmar has a total land area of 676, 578 square kilometers and is divided into Lower Myanmar and Upper Myanmar. There are also several dominant features of the country such as the horseshoe-shaped mountain complex, Mount Popa, and the valley of the Ayarwaddy River system. (Government of Republic of the Union of Myanmar, 2019). Myanmar has three seasons. The first season is cool and dry due to the northeast monsoon and lasts from late October to mid-February. The second season is a hot and dry inter-monsoonal season that lasts from mid-February to mid-May. The final season is the rainy southwest monsoon which begins in mid-May through late October. Snow is brought to

the northern mountains two months out of the year from Central Asia. The mountains stop the cold weather from moving any farther south. Myanmar's weather is predicted during the monsoons. The northeast and mostly the southwest monsoons create heavy periods of precipitation. The heavy precipitation affects all of Myanmar, except for the central region of Myanmar. (Bhutia & Contributors, 2018) The central region of Myanmar is one of the driest parts of Myanmar. This region is a part of the dry zone which consists of over four dozen townships located in lower Sagaing, western and central parts of Mandalay, and Magway. The dry zone affects more than one-quarter of the country's population who live in those regions. (MIMU, 2021) The west coast experiences tropical cyclones. (Aung, Thwin, 2020) All these can cause Myanmar to also face secondary natural disasters like floods, earthquakes, landslides, and tsunamis. (OCHA, 2013)

The typical family in Myanmar contains two or three children, with several generations of family members living together. (IES The Cultural Atlas, 2021)Myanmar families do not live under great conditions as the material homes are made to deteriorate quickly. "(UNFPA, 2017) There are approximately 65,000 villages that fall into three categories: by water, by fences, or by road. The wealthy live in better dwellings than the poor. The wealthy people live in sturdy dwellings that are made out of mahogany; while the poor live in dwellings made of wood, bamboo, and hut that is not durable under weather conditions. (Habitat for Humanity, 2021) (Hays, 2014)

The typical family meal is based on the traditional cuisine of our ancestors. Myanmar families eat a hearty breakfast, afternoon snack, and dinner. An ordinary breakfast is often onnoth khawk hswe, which is just fancy for noodles soaked in a thick milk sauce. The afternoon snack includes tea with condensed milk and naan, which is an oven-baked flatbread. One main dinner meal is meat curry. Their diet includes soup, rice, vegetables (ngapi you with tozawa), meat curries, and tea. Myanmarians occasionally enjoy fish. Their diet is very rich in vegetables and fruits but is not plain as Myanmar is known for its cultural diversity. For example, meals and snacks include pilaf rice, cinnamon, and banana rice cakes, and tamarina soup. Tamarina soup includes ingredients such as but not limited to pork ribs and bok choy. (Aisle Ahead Inc., 2021) Most meals include noodles. Their diet is based on what can be naturally produced with their fertile soil, and crops that can survive the intense monsoon rain. (Garcia & Vioud, 2015 & Win, 2018) Myanmar families obtain their food through family farming systems. Everything put on the table is produced by local farmers. The government acknowledges how important family farming is as well as the role of smallholders, which is the act of agricultural farming that is smaller than a regular farm. (FAO Myanmar Newsletter, 2021) Families in Myanmar prepare food by boiling pots of stews that sit on fire all day. (Dining for Women, 2021)

There are 19.7 million people in the Myanmar workforce from age fifteen to fifty-nine. Sixty-five percent of the labor force has a job in agriculture. Another twenty-five percent are employed in a variety of service sectors. Finally, the last ten percent of the people are employed by the industrial sector. (Advameg Inc., 2021) On average, a Myanmar worker earns an average of 545,000 Myanmar Kyat - MMK- which equates to \$408.69. 5. However, salaries in Myanmar range greatly from 138,000MMK-\$103.48- monthly to 2,430,000 MMK-\$1822.24-monthly. (Fernando, 2021 & Salary Explorer, 2021)

Families have very poor and limited access to both education and health care. There is an education system in place in Myanmar; however, children are only required to attend school until age ten- after which school is optional. Many students stop or delay continuing their education because most parents are not able to pay for their children's education, and the government provides virtually zero funding for education. Hence many people in Myanmar do not have advanced education and twenty percent of children have no schooling at all. (Humanium, 2020)

Health care is also just as inaccessible. Health care is so rare that no one gets any medical evidence when needed because it is so lacking and expensive. Myanmarians also have to sell their belongings just to pay for medical evaluation, let alone treatment. To make matters worse there is no system to protect the citizens of Myanmar. (Pyne, 2016/2021)

Families have minimal access to clean water, toilets, electricity, telephones, and roads. Less than half of the population has access to piped water and solid waste removal, so flooding, and pollution are on the rise. (The World Bank Group, 2021) Access to electricity is even worse, especially for those living in rural areas. Families rely on candles and batteries to power their energy needs. (The World Bank, 2020) In Myanmar, there are multiple cell phone companies however the reception is very bad. Therefore, it is not reliable and most people can not count on it for accurate and efficient communication. There are many transportation options including airplanes, public buses, and trains for long-distance travel and buses, taxis, trishaws, and bicycles for short-distance travel. All of these options are very efficient however they are not trustworthy because of the poor weather conditions and the high congestion levels experienced.. Myanmar's roads often become flooded and mudded, and in very extreme cases roads can not be identified. (Peace Corps, 2020)

Major barriers typical families face, in addition to earning a living and accessing nutritious food, are issues with the trade policy and women's rights. Myanmar has had issues with trade since about 1974, and in the beginning, the issues were minor. As time went on Myanmar's trade issues got worse with big consequences. One of the issues faced is trading with the US and their cooperation. However, the issues started to get slightly better after the 2012 reforms when the US began to remove complex and deep political and economic sanctions that had been imposed on Myanmar for two decades. (Rieffel, 2016) A major barrier that most people often overlook is the roles and challenges women have in Myanmar. For example, women face challenges due to traditional perceptions, institutional barriers, and societal norms. Such challenges vary from not having equal job opportunities and not being allowed to take part in building the nation up. Women cannot even take part in political issues or views. (Mon, 2018) An even bigger issue than trade policy and women's rights is how unwealthy Myanmar is. Myanmar is one of the poorest countries in Asia, even though Myanmar used to be one of the better countries in Asia. Myanmar is so poor that one-quarter of the population is living below the poverty line and in slum communities.. (ADB, 2020)

In 2011, Myanmar was ranked as the most at-risk country in the Asia Pacific due to several different climate factors including cyclones, floods, and tsunamis. (OCHA) The climate volatility in Myanmar is at a very severe status. According to the Global Climate Risk Index 2020, Myanmar had the highest weather-related losses in terms of deaths, villages, and homes in the last two decades. (Nortajuddin, 2020) Myanmar's climate volatility and change are]increasing the number and intensity of heat waves, droughts, floods, and other extreme conditions. (Mizzima News, 2019) Myanmar is on track for even more severe devastation. Unfortunately, the government has not taken enough action to help combat the catastrophic effects of the weather. Another big problem is that the weather differs vastly among different areas of the country. In some areas, too little rainfall is received at higher temperatures producing droughts, and in other areas, too much rainfall is received producing floods.

Myanmar's climate volatility is worsening. It is worsening so badly that Myanmar is looking at catastrophic impacts such as rising sea levels, extreme heat, severe flooding, and cyclonic storms. Also, instead of experiencing approximately one day a month of scorching weather, Myanmar will begin to experience between four and seventeen days a month. (Nortajuddin, 2020) Their temperature and rainfall totals have increased to an average of 0.08 degrees Celsius and

between 29-215 millimeters per decade. (NAPA, 2012) In the Southeast Asian region, Myanmar is the most vulnerable country, because it faces the most climate change. (Tun Oo, Huylenbroeck, Speelman, 2020)

Myanmar's climate volatility and change are reliant on two important factors, in addition to the vulnerable natural environment, which is human interaction and the government and society. Human interaction contributes to Myanmar's climate volatility worsening because humans do not adequately take care of their environment, causing lowering trends in agricultural production, decreased habitat options, non-drinkable water, and diseases. Natural disasters are likely a result of global warming and greenhouse gases. Also, the government of Myanmar does not put adequate amounts of money or resources into decreasing greenhouse gases and carbon footprints. Nor does the government put proper precautionary measures in place to prevent detrimental damage. Since no precautionary measures are not put in place it costs Myanmar more money to fix damage caused by climate volatility. (Slagle, 2014)

The rural population will be nonexistent in a decade if Myanmar officials do not take action against the weather conditions Myanmar experiences. Many families and villages are moving away from the rural life where intense frequent droughts and dry spells occur and are moving to the cities for better life and work. (Daniel, 2018) Myanmar's urban population is continuing to increase. Even though urban populations still receive volatile weather urban populations are much better prepared than rural populations are. Urban populations are learning and implementing urban disaster risk reduction models and better prepared for Myanmar's climate volatility. (IFRC, Myanmar Red Cross, 2020) As people move away from rural areas, the number of people farming also decreases. Which increases food insecurity in Myanmar.

Climate volatility affects men and women differently because women have less education than men do. Women have fewer opportunities than men to take part in making decisions and to markets, capital, training, and technologies. (Myanmar Climate Change Alliance, 2014) This means that women are not as knowledgeable about the weather conditions and how to properly prepare for them, so that leaves most of the work to the men. However, since women are around the house more, and care for the homes, women can better prepare the house. Women are at home so much that local mayors have started to call for women's advice on what actions to take in order to fight off the weather conditions with the best effort. The elderly and children are most at risk, so they do everything possible to help but most of the time that equates to just sitting inside safely waiting out the weather. Marginalized populations are affected greatly because these populations are already living in high-risk conditions. Marginalized populations are more at risk of losing their homes, catching illnesses from the weather that is passed along in the floods, and also dying. Their only hope is Myanmar's Red Cross groups and its associates.

The climate affects the environment because it damages crops, infrastructures, and ecosystems. The weather is unstable, which equates to the loss of production. (Nortajuddin, 2020) Once the precipitation patterns begin crops slowly start to fail. The environment is affected because the intense weather brings heat waves, droughts, and floods. (Mizzima News, 2019) Myanmar is shaped like a diamond which adds to the issues because the borders make them more susceptible to bad weather. Moreover, droughts, cyclones, and flooding cause the environment not to be clean, which is essential to keeping its people safe. Global warming is slowly but surely weakening Myanmar's environmental resilience. (Win and Batchelor, 2019)

Water needs to be distributed more evenly across Myanmar. A water diversion system should be implemented to help control the amount of water each area receives. A water diversion system is an effective way to control water amounts as it will capture any excess water and transport it to

any areas that are lacking water. More explicitly, the water diversion system is a structure that takes away surface water and transports it to any given area. While the water is being transported to any given area it will be filtered so it can be used as drinking water if needed. The water diversion system would solve Myanmar's vulnerability because it would give Myanmar an effective kind of protection against all the harsh and hazardous weather received. (NIWA, 2016)

The water diversion system will be located throughout Myanmar year-round, but will not get in the way of everyday life. The water diversion system would accomplish three things. It would block water from attacking villages and homes during bad monsoon weather; it would carry all the excessive water it just stopped to other parts of Myanmar that do not receive enough water; and it will filter the water during the process of transportation. Water filtration is vital so people can safely drink water. (Lateef, 2009) A water diversion system is usually used for construction purposes. It can divert water permanently or temporarily using certain barriers like canals, pipes, or dams.. (NIWA, 2016) Water diversion systems are usually put in place to construct irrigation canals or pumping stations. Water diversion systems do not occupy a huge amount of space and are usually focused on agricultural developments, job creations, or power generation. Water diversion systems are used for many purposes and are proven to be extremely effective. (Encyclopedia, 2021) In New Mexico, it costs about \$66 to \$128 million a year to meet local water needs and to federally divert 14,000 acre-feet. It would be estimated to cost Myanmar around the same to build and sustain any water diversion system. (Siwik)

A major cultural norm that needs to be considered is the supplies that will be used. No antiques could be bought as that would be deemed disrespectful to Myanmar's unique heritage. Wildlife products should not be used either as most of Myanmar's wildlife is becoming endangered. (Myanmar Holidays, 2012-2020) This project can be sustainable because it should just need regular check-ups especially before and after hazardous weather, or any weather. As long as it is properly taken care of and checked regularly the water diversion systems should last for at least a century if not longer. (County of Los Angeles Department of Public Works Los Angeles County Flood Country District, 2016)

In an ideal world, the government of Myanmar would lead this project. However, Myanmar simply does not have the money or resources to do so, and their government is not reliable enough to ensure funds are probably being allocated. Ever since 1996 UNOPS has managed all projects and things similar to this that are going to need volunteer work and funds. UNOPS, United Nations Office For Project Services, manages a bunch of organizations and relief funds through Myanmar, but it also manages the biggest development funds Myanmar receives and needs. However UNOPS does not do this alone, it calls on other UN organizations to help them in times of need. These other UN organizations include both national and international partners that work for associate governments or non-government entities/agencies and donors that are both bilateral and multilateral. (UNOPS, 2021) (UNOPS, 2010) According to UNOPS, this project could be funded by "The Livelihoods and Food Security Fund (LIFT), The Access to Health Fund, and The Joint Peace Fund." These funds are obtained for Myanmar and 80 other countries without taxpayer funding but through fundraising and advocacy. (Mohinga, 2019) The community members and the government are also vital in implementing the plan as men in the community will install the water diversion systems, and the women will provide workers with food. (Childree, 2017) The government needs to implement a timeline and supply the workers with materials given from the organizations. The government will also need to protect all the workers.

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