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Bangladesh: The Rise of Malnutrition for Rohingya Refugees

Modern day society has been bubbling up with hate and discrimination for years. Now, Myanmar has hit the breaking point as unimaginable pain of genocide erupts upon “the world's most persecuted minority”(India Today, 2017). The surviving victims have low access to supplies needed to help sustain a healthy life, along with conditions of discrimination and health issues. Rohingya families or individuals flee to Bangladesh, the country known for being the third largest Muslim community in the world. The land of Bengal has opened her doors for incoming refugees who seek safety and food. Rohingya refugees are flooding into Bangladesh but the country is running out of space to hold more refugees and food shortages are starting to become more prominent while food insecurity is already a dangerous problem in Bangladesh.

The Buddhist culture in Myanmar has been growing to their limitations, and a deprived Muslim group is barely surviving underneath. The Rohingya are known as being the world's most persecuted minority and have been calling the Rohingya people “the world’s most persecuted minority” (Al Jazeera, 2018). The persecution started decades earlier than today when buddhist and muslim communities had differing opinions on social structure and political beliefs. The first Rohingya genocide started during World War Two, with a death toll of over 100,000 (M.S. Anwar, 2017). During 1954-60, Rohingya muslims were recognized as citizens until 1962 when General Ne Win overthrew the government, and the ill-treatment started again (M.S. Anwar, 2017).

In Myanmar, married couples are only allowed to have two children, very few families get away with having more. This restriction on their rights to bear multiple children was intended to prevent overpopulation within the group. From 1974 to current day, the government still denies Rohingya muslims the right to vote and are deprived of citizenship since 1982 when the military government passed a citizenship act that deprived citizenship based on “national races” and whether or not an individual provided documentation proof that they lived in Myanmar before January 4, 1948 (M.S. Anwar, 2017). After 1992, Bangladesh no longer gave refugee recognition to the Rohingya minority group until 2006 when the Arakan National council declared Rohingyas as Bangladeshis once again (M.S. Anwar, 2017).

The factors of this rising mass killing is steadily getting worse socially and politically. The Rohingya population has had a dramatic decrease due to Myanmar’s military advances on the Muslim group, it was once believed that 1.1 million Rohingya people lived in the Rakhine state in Myanmar(India Today, 2017) and now that number is currently unknown. Individuals are also deprived of decent nutrition therefore malnutrition and dehydration rates buildup. Recently with mass murders and villages attacked in Myanmar, the Bangladesh government and army has allowed Rohingya refugees to enter into refugee camps in Cox Bazar’s district.

Refugees travel by land which seems to be the most popular route or go by sea, Mohammed Khasim is only one of many survivors who chose to flee the carnage by water. His boat left at 8pm with almost 80 people, the journey was supposed to take a couple hours but the crew got lost in the dark. The group stayed out all night without food, drinkable water and proper supplies. The waters became rough and the makeshift boat fell apart. Khasim lost his two daughters and wife, while his son and himself survived the water which would eventually become a graveyard to his family and others (Prior and Holmes, 2017). Survivors are famously nicknamed “the boat people” after fleeing by boat across rivers for safety, food and shelter(India Today, 2017).

After crossing the Naf river between Bangladesh and Myanmar, the stateless individuals are taken to different refugee camps set up in Cox Bazar's district by Bangladesh's government and army, the United Nations and anti-genocide groups. The Land of Bengal is run by a parliamentary republic who oversees the wellbeing of their country. The government has openly campaigned and brought this issue to the international stage. A state of emergency has been declared in Cox Bazar's district issued by the head of government Sheikh Hasina. Although a typical diet of the Rohingya culture consists of rice, vegetables, milk and occasionally meat. The overseers pass out rice, vegetable and lentil; pregnant women, mothers who are breastfeeding and children under 5 are given porridge (ReliefWeb, 2017). The food quantity passed out among the refugees continues to decrease creating a wide scale panic as the reduction in food becomes a preventable problem (Cetus News, 2017).

The Muslim individuals immigrate into the camp with impoverished infant and child health insecurity, women arrive with lack of childbirth care, and individuals show up with malnutrition and waterborne illness. Medecins sans Frontier or Doctors without Borders has sent teams to Bangladesh since 1985 and is continuing to expand within the refugee camps and the country. Doctors have reported treatments for bullet, and stab wounds, and other injuries related to sexual aggression on women and young girls (Doctors without Borders, 2018). Nearly 60% of all refugees entering the camps tend to be children who are dehydrated, malnourished and suffer from PTSD. Expecting mothers are found to also be malnourished, suffering from anxiety and/or depression (ReliefWeb,2017). Fundraising has been set up to help refugees gather safe and clean medical equipment to treat people in a safer way per month, along with food and clean drinking water.

Refugee camps have started to take more land; available land for agriculture is decreasing. Bangladesh's agricultural percentage stands at 70.63%, the country's cultivation is extensive for a country of 56,980 square miles (Trading Economics, 2018). With Bangladesh's fertile soil created by subtropical climate and monsoon seasons; rice, jute and wheat are the main vegetables grown. Farmers uses manmade and natural water canals to irrigate their crops which are harvested three times a year (on average). Donated food has become a quick solution for the refugee camps at this point.

As the population rises, refugees within Bangladesh's camps have gradually created their own communities. Rohingya leaders direct themselves to be in charge within the camps. Children arrive with little or no education, therefore schools have been established to help the children and their education. They're given materials to write with and on, and books with other educational supplies needed to create a safe and child friendly atmosphere. Families and friends create makeshift tents that hold multiple people underneath. Nevertheless, people are forced to borrow, or steal food from one another in order to feed themselves or families (Marching to Genocide, 2014). Since a majority of families don't have access to protein and nutrients needed to sustain the human body. Without the help of (non-profit) organizations, and donations from the United Nations and United States. Bangladesh wouldn't have been able to uphold the almost 900,000 people as well as the increasing population of 165 million in the country. Bangladesh has been apart of the United Nations since 1974, all while the United States and Bangladesh are strong traders with one another. The U.S are heavy suppliers of soybeans, cotton, wheat and dairy for Bangladesh and their economy..

The United States involvement of gene-splicing has helped farmers harvest without worries of dangerous temperature, climate changes or any dangers within the environment. Genetically modifying crops has been taking place for thousands of years, farmers were wanting new things, a better lifestyle or a way to increase their income. But what makes a GM crop different? Every plant or animal has changed so much since their pre-domesticated state. Selective breeding takes a long time to get the desired trait and sometimes it doesn't work out, but with genetic engineering, gaining the desirable trait is faster and we get to choose what we want instead of having a small chance (Kurzgesagt - In a Nutshell, 2017).

To create this, a Transformation phase needs to happen; remove a desirable trait from a donor organism and implant the DNA into new plant cells (GMO Answers, 2013) . Bangladesh also has gone through with GM crops before when technology started to slowly emerge; eggplant harvests were completely destroyed by pests. Farmers relied heavily on pesticide spray which was very expensive and got farmers sick as well. After the first modified eggplant appeared in 2013, pesticide spray decreased by 80%, farmer's health life revised, and their income expanded (Kurzgesagt - In a Nutshell, 2017).

Genetic modification can help Bangladesh and refugees harvest crops that have been designed to fit Bangladesh's harsh monsoon season and dry winters. Biotech gear has worked over many nutritious crops including eggplant, maize (corn), soybeans and Bangladesh's major crop sources (rice, wheat, and jute). Many first world countries have gone through the process of GM crops like the United States, China, Great Britain, Canada and other developed countries, and it can be useful for refugee camps as well. GM crops have a better nutritional value for people and the cost of gene-splicing crops DNA stays low. Gene-splicing crops can help withstand natural disasters, insect and build up herbicide tolerance (Nuffield Council on Biotechnics, 2018). Bangladesh may be considered a less developed country, but with major support the country can start to reinvent their own biotech gear. Crops can be genetically modified to combine more additional nutrients that are lacking from Rohingya refugee's diet.

GM crops are checked for any possible dangers and the results are assessed by multiple groups before consumption. Eating GM crops also have the same amount of risk as eating non-GM crops (Kurzgesagt - In a Nutshell,2017) and are able to save the environment and decrease damage by using less land usage, and less conservation of energy, soil and water. There is less harmful materials used on the crops and can save endangered crops from extinction (Vittana, 2018). The world is expanding, more rapidly than anyone would have predicted. The world currently eats an estimate of 11 million pounds of food everyday, and will increase by more than 70% by 2050 (Kurzgesagt - In a Nutshell,2017). GM crops will be able to help us step out farther into helping one another in a world we would have never imagined.

For growing GM crops, implementation is decreasing as refugee camps expand. Vertical farming has been known for taking up less land and uses less water. One indoor acre equals to 4-6 outdoor acres, land use availability increases and decreases postharvest decay. Vertical farming is a huge human friendly environment along with promoting less ethics such as disease, poisonous chemicals and accidents with handling farming machinery (Cropsreview, 2018). Vertical farming promotes regrowth of trees, and reduces the usage of burning fossil fuels. Vertical farming is allowing crops to be harvested year round in a controlled atmosphere by what is needed for the plants ultimate survival. A typical outdoor crop takes a long time to grow but with the techniques used in vertical farming, the growth cycle is cut in half. There are currently companies such as AeroFarm who have been able to successfully grow crops like kale, red romaine, watercress, and bok choy. Vertical farming can either use Hydroponic or Aeroponic systems inside the facilities. The water used is a nutrient based solution recycled from dirty water for agricultural use (Cropsreview, 2018).

The hydroponic system works when crop roots are grown in a nutrient/mineral water base; plants mature 25% more rapidly and produce 30% more crops than soil based crops (Fullbloom Hydroponics, 2018). Crops grow larger and more stable because the crop focuses more on growing upward instead of root expansion to gather nutrients (Fullbloom Hydroponics, 2018). The nutrient solution needs to be changed every 2-3 weeks and keep water temperatures between 65 and 75 degrees for quicker growth. Another method used in vertical farming is called Aeroponics. The crop is held up in the air while being sprayed every few seconds every 5 minutes or the time desired; 95% of water is used less than on outdoor irrigation (Stories, 2016) along with water being used 40% less than hydroponics (AeroFarms, 2018). Aeroponics allows for more control over plant roots, thus can

make it more mobile for transportation. Since the roots are exposed to more oxygen, the growth rate increases more rapidly than outdoor agriculture (Gardening Site, 2018). Even though the plants grow without soil, they tend to grow faster and stronger with the right resources provided.

Plants need five things to grow; light, water, carbon dioxide (CO₂), oxygen, and assorted nutrients and minerals. Water and extra nutrients is mixed into one solution while oxygen and carbon dioxide are gathered from the air. But how do we get sunlight in a closed off space? LED lighting has been able to improve the growth rate and quality of plants around the world and in space. Energy is reduced with proper LED lighting; they don't require ballasts like fluorescent lights and aren't a major heat source; so they can be brought closer to the plants (Knowledge Center, 2016-12-17). With solar panels connected to the LED energy sources, the sun can ultimately produce electricity needed to sustain the LED bulbs. The technique of vertical farming has been seen as an effective way to feed overpopulated urban areas, but rural areas are in need of the same help. With vertical farming we can grow a larger quantity in a smaller space so refugee camps can continue to take in arriving Rohingya individuals. The plants go without pesticides, herbicides and synthetic fertilizers which are very harmful on crop growth and their environment (Cropsreview, 2018). Crops need a place to stay and using vertical farming is the future within agriculture; land space is decreasing and room for agriculture is declining along with it.

Although plants serve as nutrients, protein is still needed as well. Protein is a viable source of defeating malnutrition and restoring the human body, and an efficient type of protein comes from grasshoppers. Grasshoppers are made up of 20.6 grams of protein and have a low source of fat at 6.1 grams. The protein of a grasshopper's body is comparable to a roasted chicken breast's protein at 31.02 grams (Sifferlin, 2013) and a grasshopper's body is built of 75% of protein which is high compared to other similar insects (Scott-Dixon, 2018). Grasshoppers have higher levels of nutrients like calcium, iron, and zinc compared to other animals. Grasshoppers contain as much vitamin B12 as salmon and contain 15% more iron than spinach (Miller, 2014). Families will be able to create their own meals with flour made from grasshoppers or even roast the insect species themselves for consumption.

Catching grasshoppers takes up a lot of time and energy but reproducing grasshoppers is an easier and more efficient way for harvesting grasshoppers for utilization. The proposal is to produce grasshoppers in a more dynamic space within a building; grasshoppers will need to grow in a climate controlled facility with proper equipment. Grasshoppers need to be fed a small diet of plants, vegetables, cereals or crops within a warm environment. Consuming grasshoppers is an easier way to eat because people can eat 80% of its body, versus eating 40% of a cow's. There are multiple benefits that come from consuming grasshoppers, different parts of a grasshopper's body can be used to help human health; grasshoppers can be used to treat kidney diseases, and gastrointestinal diseases. They're also able to eat materials the human body can't digest such as wood or mulberry plants (Scott-Dixon, 2018). Grasshoppers are able to be fed 6 times less than cows, 4 times less than sheep and 2 times less than pigs so major crop sources don't have to go towards feeding grasshoppers (Signus Farms, 2017).

The United Nations Food and Agriculture Organization has declared that there are over 1,700 edible insects in the world across the world in 113 countries; many people use insects as a substitute for chicken, beef, bird, fish or seafood. Eating grasshoppers is also less harmful to the environment since forests don't have to be demolished to create grazing land (Tibbetts, 2008). Numerous cultures integrate eating grasshoppers into their diet because they're easy to reproduce, eat and hold less harmful activities on the environment around them and to themselves. Grasshoppers are especially easy to eat after you remove the legs, wings and excreta.

Grasshoppers doesn't have cholesterol, added sugars, saturated fat or any lactose. Grasshoppers are harvested in the wild but we can domesticate them into breeding and growing them inside one solid space. Insect farming needs very little energy and resources to grow grasshoppers. For every 100 grams of water; 71 grams of grasshoppers are able to survive to harvest (Signus Farms, 2017). Cultivating grasshoppers is more desirable because people can eat 80% of its body, versus eating 40% of a cow. Grasshoppers are able to grow in an environment without antibiotics, hormones and/or grain fed material.

With plants holding much nutritional change, using grasshoppers as a viable source of protein promotes less land usage and are able to be fed less, which can help conserve water and food and defeat malnutrition in the Rohingya people. Vertical farming is the future of agriculture as land availability decreases to make room for more people. GM crops are seen as a new organic way of farming, without worry of environmental damages or diseases. Grasshoppers are a viable source of protein and nutrients with multiple benefits of health and space conservation. Using vertical farming or GM crops, are two sides of the same coin. Both strategies fight against space availability, cutback environmental harm and defeat malnutrition all together.

The issue at hand can be decreased drastically with proper involvement of the United Nations, the U.S. and individuals all around the world. More people need to become more involved in this crisis, whether it's the standards of this ethnic cleansing and the food issue that has plagued Bangladesh's refugee camps. Bangladesh has been providing food, medical checks and shelter. Donations for food, clean drinking water, money or any other materials seemed neccessistable. Bangladesh must continue to bring both of these issues to the international community. Doctors without borders must continue to work and help others within this refugee crisis. Anyone can help someone, it all depends on how you do it and what you do. Many organizations around the U.S and the world is the key to helping refugees in Bangladesh and around the world including Doctors Without Borders, USA For UNHCR, GlobalGiving, Save The Children, and Mercy - USA For Aid and Development are few of the many organizations that help the Rohingya refugee crisis in Bangladesh by bringing drinkable water, clean food or a place to sleep.

In the past, humanity has been able to go to outer space, explore new environments and learn the different types of species that inhabit there. Humanity has been able to grow ourselves into a God of our own. But there are still flaws in our ways, malnutrition has been increasing every day with people eating too little and not having the right nutrients and protein for their own sacred bodies. Malnutrition in Bangladesh refugee camps is a critical unknown crisis among the world. The culture of a group of people is falling drastically: many aren't surviving because of the right nutrition that their bodies need to obtain. Children are growing up in a place where food is a privilege to have. The Rohingya genocide is a quiet tragedy that needs to be brought out to the international arena and the issue is in our hands, without a right now solution, the world will lose more people instead of saving by 2050.

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