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Afghanistan: All Roads Lead to Small Farms

Hunger has been rising in Afghanistan for several years; following the Taliban's takeover, the situation has worsened (Lutz and Kurtzer, "Afghanistan: Economic"). Maryam (whose name was changed) is a 26 year old mother of five from the Faryab Province ("ALMOST 10 MILLION"). In this province, many families eat just one meal each day, and hospitals see so many children with acute malnutrition that they are overflowing ("ALMOST 10 MILLION"). She shares, "I am worried about my children. I can only borrow cash and buy them food, but mostly I don't have sufficient food for them. Sometimes we have food and sometimes we don't ("ALMOST 10 MILLION"). One contributor is that agriculture in the country is not sustainable within current conditions.

The average household size in Afghanistan is eleven people ("Average Household"). To support households, the average monthly income is equivalent to $526.05 USD, hardly enough to feed a family of eleven ("Gardening / Farming"). This is largely attributable to lack of proper education in the country ("Poverty Reduction").

Due to new Taliban policies, girls are not permitted to receive education after attending primary school (Sharma). Teachers are typically hired after meeting minimum academic requirements ("Education"). Many children do not go to school due to a lack of transportation and a shortage of schools in most areas ("Education"). Most children would have to walk a long distance to get to a school. This long distance decreases the likelihood that they will attend ("Education"). Lack of proper education causes children to grow up without knowledge needed to get jobs that would offset challenges to farming, which was the occupation of 70% of citizens as of April 2020 ("What are some"). Many citizens lost jobs when the Taliban regained control over the country, causing an economic collapse (McCarthy and Reinhart).

The conflict with the Taliban was a large factor in the country's descent into an economic crisis. According to the International Rescue Committee, many international donors suspended their non-humanitarian funding ("Afghanistan: An entire"). This froze billions of dollars in assets, causing an economic collapse in the country ("Afghanistan: An entire"). The Taliban's refusal to allow women to work for non-governmental organizations caused many such businesses to have to suspend their operations in the country, as they cannot deliver the services needed without female personnel ("Afghanistan: An entire"). This is devastating to many Afghans, as a large number of those organizations provided essential services and food for many families.

It is these conditions that have led to Afghanistan becoming poverty-ridden today. Over 90% of Afghans were food insecure as of August 2022 ("Afghanistan: Economic").

Women and children were hit especially hard by the economic collapse and the Taliban's takeover of Afghanistan. In March 2022, 95% of Afghans were not getting enough food ("Afghanistan: Food"). This deprivation was nearly 100% in female-headed households ("Afghanistan: Food"). In September 2022, the Oxford University Press reported that the humanitarian crisis that followed the Taliban's takeover had left over 3.3 million children unable to get food, which causes dozens of adolescent deaths every week (Rahmat et al.). This is largely due to job loss following Taliban takeover (McCarthy and Reinhart). The Human Rights watch interviewed several people within the Ghazni province who had had their bank accounts frozen ("Afghanistan: Taliban"). Without cash, there is no way for citizens to provide for their families, leaving children hungry ("Afghanistan: Taliban").

The average farm size in Afghanistan is four acres, which is slightly more than three football fields ("7 Examples"). Over the past few years, many of these farms have been heavily affected by severe drought. This, coupled with both economic and political conflict, is causing the population to face severe food insecurity. A large portion of the population was already food insecure before the Taliban took over, as the drought caused food prices to soar (Dent). As a result of Taliban takeover and economic collapse, food prices are even higher, which makes the situation even more difficult (Loy). These conditions are why, to many of the Afghan population, access to enough food seems an unreachable goal.

Solutions do exist to overcome drought within the country and to help feed those who are on the brink of starvation, a number that is currently at a staggering six million ("Afghanistan Emergency").

At the UN Food Systems Summit in 2021, Marie Haga, the Associate Vice President of External Relations and Governance; UN's International Fund for Agricultural Development, stated that small farms are the key to solving food insecurity (Haga). They help build trust and attachments within the communities they are in, and are more likely to take care of their environment than large farms (Haga). An obstacle to this solution is the drought that has plagued Afghanistan for the past two years. The country is facing its third consecutive year as of August 2023, according to the United Nations Office for the Coordination of Human Affairs (*United Nations*).

The Karez Irrigation Systems, which have been used in the country for over 3,000 years, tap into the groundwater in hillsides with long, often hand-dug, tunnels that span several hundred miles, and often have vertical shafts for maintenance (Williams, Mayar). These systems are used by most of the southern provinces of the country, as this system allows water to travel long distances in dry climates, decreasing the amount of water loss as a result of evaporation. As of August 2021, these systems were the only source of water for most rural villages, particularly in the southern and southwestern areas of the country (Ghai).

Over the past 40 years, some of the thousands of Karez Irrigation Systems across the Afghan provinces have become inactive (Ghai). In 2018, only 11% of the 5,887 recorded Karezs were active (611), due to drought, conflict, and abandonment in favor of modern structures (Himat and Dogan 1). The 2018-2019 drought was one of the worst Afghanistan had seen at the time, leaving an estimated 14.3 million Afghans food insecure. Fortunately, many of the irrigation systems seemed to have been rehabilitated and several were added, bringing the overall number of active Karez systems to 9,370 by August of 2021 (Ghai). However, the October 2022-May 2023 dry season, the third consecutive one the country has experienced, was projected to leave 15 million people food insecure ("Afghanistan: Drought"). Because of this, as well as the conflict of the Taliban takeover, the rehabilitated irrigation systems are now likely inactive once again.

Fortunately, potential solutions do exist. According to an article written by Meril Cullinan, the Senior Communications Officer at Action Against Hunger, there are ways to help families affected by food insecurity through small farms, which could even be the size of house gardens. Afghans could learn climate-smart farming techniques such as hydroponics and vertical farming to grow resilient crops despite limited rainwater (Cullinan).

In addition to teaching climate-smart farming techniques to food insecure families, Action Against Hunger is helping herders navigate drought by creating the Pastoral Early Warning System, which gives real-time alerts to help herders navigate better grazing land (Cullinan). They have also begun establishing farmer cooperatives led by locals to encourage trust within the communities (Cullinan). Solar Power is also being utilized to help farmers get through droughts and days where the sun's heat is particularly challenging. Energy from the sun is being used to fuel many machines such as water pumps and portable

irrigation systems (Cullinan). Additionally, the organization is helping farmers utilize all of their natural resources, including the land, soil, water, and the seeds (Cullinan). They also provide cash in emergency situations, helping people ensure that their crops last throughout the lean season, and working with women to provide sources of income. This is very helpful for women who are displaced by climate shocks such as floods (Cullinan).

Action Against Hunger also teaches farmers ways to improve soil quality that's been damaged by drought and other climate shocks (Cullinan). These teachings, such as composting to help fertilize fields, were also taught to farmers in Pakistan, in addition to hydroponics and vertical farming (Cullinan).

According to the National Park Service, “Hydroponic systems use less water — as much as 10 times less water — than traditional field crop watering methods because water in a hydroponic system is captured and reused, rather than allowed to run off and drain to the environment,” ("Hydroponics: A Better"). Hydroponics can also increase crop yield, and if utilized indoors, can be grown all year long in most places ("Hydroponics: A Better"). If implemented, this technology would save Afghans a tremendous amount of water, as agriculture accounted for 90% of the country’s water usage in 2021 (Water, Peace, and Security Team).

There are several types of hydroponic systems that could be implemented. One is the “wick” system, where plant roots grow down through a growing medium to, which permit roots to get oxygen while an absorbent “wick” draws nutrient-filled water up from a water reservoir to the root system zone ("Hydroponics: A Better"). Another is the “Air-Gap” technique, which requires the plant’s roots to hang partially suspended in nutrient-filled water while the upper part is left exposed to oxygen ("Hydroponics: A Better"). The “Raft” technique positions the plants on a floating surface with their roots hanging in nutrient-filled water, completely submerged. To supply oxygen to the roots, a pump similar to one you may see in a home aquarium would also be placed in the water ("Hydroponics: A Better"). With the Aeroponics technique, plant roots are placed in an enclosed space and nutrient-filled water either frequently flows through the space, or is sprayed on them with a mister/spray bottle ("Hydroponics: A Better").

The most commonly used hydroponic system is the “Drip” technique, in which nutrient-filled water is pumped from the reservoir up through tubing to plants that are placed in growing mediums ("Hydroponic Drip","DRIP SYSTEM"). The water and nutrients are distributed through evenly-spaced drippers ("DRIP SYSTEM"). The water then filters through the growing medium and is absorbed via the roots ("DRIP SYSTEM"). To combat root flooding, excess water is collected in a run-off and typically collects in a reservoir to be recycled.

In Pakistan, the Action Against Hunger organization has already established schools to help teach these techniques (Cullinan). Due to severe drought over a long period of time, soil quality has likely been depleted (Cullinan). To combat this, farmers in Pakistan have planted crops such as sugar beets, which help reduce the saline levels in the soil.

Another climate-smart farming technique is vertical farming. This is a technique that sounds new-age and modern, but actually was first recorded in the Babylonian Hanging Gardens 2,500 years ago ("What Is Vertical"). Through hydroponics, vertical farming has been proven to use 98% less water and 99% less land ("What Is Vertical"). Vertical Farming has proven to be successful in locations similar to Afghanistan for several years. In 2006, farmer Sohail Ahmed had to shut down his farm due to a worldwide recession ("PAKISTAN'S FIRST"). However, after learning about futuristic farming methods, he opened Pakistan’s first vertical farm ("PAKISTAN'S FIRST"). By 2019, Ahmed’s farm was booming, supplying greens to local vendors. His son, Fahran, studied engineering at a University in America, and manages a large portion of the farm. “We have 70 times more production per square meter as compared to field farming,”

he said, and added that the elimination of pesticides and preservatives meant the produce that came out of his vertical farm was ‘extremely healthy’,” ("PAKISTAN'S FIRST").

In 2020, the Food and Agriculture Organization of the United Nations (FAO) made plans to implement hydroponic water systems in Jordan, which would increase the country’s water security and improve the efficiency of its agriculture ("FAO launches"). According to an FAO Representative Ad-Interim out of Jordan, “Studies showed that every 1 kg of tomato needs 63 liters of water in conventional agriculture, while it only needs 26 liters in hydroponics. This is critical in a country where water is a major challenge for sustainable development,” ("FAO launches"). Improving water security is particularly important in Jordan, one of the most water-scarce countries in the world due to population growth and the increase of refugees coming into the country to escape conflict. If this project and the water-based projects the FAO started were successes, Jordan’s economic and political standing would be improved. ("Water Resources"). The same methods and logic can be applied to Afghanistan’s sustainable agriculture.

The FAO has implemented similar water-focused programs in countries facing similar issues, such as Tunisia, Palestine, Egypt, and Morocco ("Water efficiency").

The FAO has been working to provide solutions through a project that aimed to help over 200,000 Afghan citizens ("Afghanistan: FAO intensifies"). They sought to provide training to many small farmers, particularly women ("Afghanistan: FAO intensifies"). Unfortunately, the Taliban’s limitations on women’s rights is a threat to women being permitted to participate in such training.

In 2009, the World Bank helped rehabilitate two irrigation systems in the Bayman Province ("Farmers Continue"). In 2021, over ten years later, thousands were still benefiting from the rehabilitated systems ("Farmers Continue"). If the FAO used funding from their current training solution and used it to train citizens to rehabilitate just two of the abandoned Karezs in each province, as the World Bank did in 2009, the impact would be similarly impactful.

With the help of other charities, such as the International Rescue Committee and Action Against Hunger, efforts could be made to provide training in hydroponics (as the FAO did in Jordan) as well as in vertical farming. Perhaps those taught could teach others to utilize these techniques to grow small farms. If these small farms were, in fact, just large vertical gardens on their own property, women may be allowed to tend to them while their husbands are at work, as this is typically seen as a household chore.

However, ensuring that Afghan families receive this training, even if it can only be to men or boys within the household, would be entirely dependent on the Taliban’s willingness to accept the offered help to save citizens from malnutrition.

Given that the Taliban did accept the help, this practice would help Afghan families in three ways. The first, of course, would be that they would have food to feed their families. Secondly, they would have more water for themselves, since hydroponics would decrease water usage. The third benefit would come from selling crops, which would benefit both the family and others in the community economically. If others in a community were taught to grow their own small farms, trading of different herbs, fruits and vegetables between houses would be possible, establishing new systems in the wake of their economic disaster.

In August of 2022, the Human Rights Watch reported that more than 90% of Afghanistan had become food insecure since August of 2021, when the Taliban regained control over the country ("Afghanistan: Economic"). The Taliban’s policies have put women out of work, making it harder for families to get enough food ("Food and economic"). Hope is possible through teaching women climate-smart farming

techniques and continuing to build irrigation systems to help combat droughts that have plagued the country.

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