

## **Defeating Food Instability in Yemen in the Aftermath of International Conflict**

Aquaponic farms, greenhouses and kitchen gardens can all boost food production in certain countries. But how do you combat persistent food insecurity in a country plagued with rampant gender inequality, sparse fresh water and little arable land, and international conflict resulting in mass destruction? Yemen is a nation marked by extreme poverty with limited resources as compared to their wealthy Middle Eastern neighbors. Addressing food insecurity under these conditions requires a multi-faceted solution.

Yemen sits on the corner of the Arabian peninsula, with approximately 527,970 square kilometers and a population of about 29.16 million. The land is largely desert and unsuitable for farming. In fact, only 3% of the land in Yemen is considered arable, and despite being surrounded by the ocean on two sides, fresh water access is sparse. This isn't all too uncommon among countries situated in or near the Middle East, an example being the United Arab Emirates, with less than 1% of arable land. Over 70% of the Yemeni population resides in rural areas. Bordered by the Red Sea, Yemen is well situated for trade. (Encyclopedia Britannica).

Roughly 50% of the Yemeni population has difficulty accessing fresh water, according to an ARCGIS article. Droughts and large expanses of barren land where rainfall is completely absent leave many areas without any access to water other than a dwindling groundwater supply. Currently, there is no established rainwater collection system, even though these are cheap, easy and inefficient, and can last for a long time once put in place. The groundwater supply is not unlimited, and nobody knows when it will run out.

Conflict between Yemen and Saudi Arabia has taken an extreme toll on the Yemeni citizens. During this conflict, Saudi Arabia bombed and destroyed farms, boats, ports, schools, businesses, essential factories, food and water supplies, and other items necessary for a secure and healthy life. Out of almost 30 million people, 24 million are in need of some sort of humanitarian assistance, including more than 12 million children, and 85,000 children have died due to starvation in the past year due to resource destruction. (Encyclopedia Britannica).

Because of the destruction to fields, soil, and equipment, farmers were unable to operate machines for lack of fuel and currently more than 40% of households in Yemen are unemployed. Any solution must find a way to repair existing damages, increase food and water supplies and boost distribution to the people. Job creation and economic stability should be top priorities in Yemeni society, as it's the fastest way to stabilize the economy.

The World Health Organization states that three out of every four families in Yemen are impoverished, and each family has an average of 4 children, the majority of which are extremely malnourished. Many families of 6 or more currently rely on monthly rations given out by the

WHO, which while helpful is an ineffective permanent solution. These rations will not last forever, and while they are helpful in feeding some, the WHO doesn't have the supplies to feed every citizen in Yemen. Believing that this is a permanent solution would do harm across the globe. Creating jobs for the unemployed is one way to go about solving food instability in a more permanent manner.

During the Yemeni war, women were hit the hardest. Yemen has ranked last on the Global Gender Gap report for the last decade. Girls are less likely to be enrolled in or remain in school because of societal expectations, and women are also at the forefront of the hunger crisis. Traditional Yemeni society states that women and girls can only eat once boys and men have had their fill, even if the females are pregnant or lactating. Many children get their primary nutrition for the day from school lunch, but girls are often pulled out of school and married before reaching the age of 12.

Only 55% of women in Yemen are literate, compared to 85% of men, according to the Center for Strategic Studies. Emphasis on women's schooling could lower the fertility rate for women, which is currently at almost 4 children per woman. Finding another role for women in society through education would put the focus more on working and less on having children. This could reduce the population growth rate, which would mean more resources and fewer children dying of starvation. It would also be beneficial for women to learn about agricultural practices, because all citizens should know how their food is grown. Being educated about farming could make it easier for women to find jobs, since less than 7% of Yemeni women are currently employed.

It may seem that a solution to the nationwide food insecurity crisis could be as simple as gathering more international funding for job training and rebuilding. However, the issue with this solution is that Saudi Arabia could destroy everything Yemen citizens put in place with bombs, drones, troops, just like they have in the past. While it is extremely tempting to address the immediate needs, humanitarian efforts will be more effective by taking a multi-pronged approach.

A potential solution would be for Yemen to create and strengthen alliances with stronger nations to discourage Saudi Arabia from attacking once again. Allied nations could create programs to teach the citizens how to rebuild, as well as provide aid and supplies. This reduces the risk of Saudi Arabia attempting to destroy them again, since they're aware the more powerful country could refuse to trade with them or even start a war. An ideal country to partner with would be the United States, though it would be difficult. The US has continuously backed the Saudi attacks on Yemen and supported them for its own benefit, so their agreement to help Yemen may be hard-won. However, having the US as a partner could also be an extreme

advantage for Yemen, because Saudi Arabia couldn't reasonably launch an attack if it's biggest global supporter decided to help rather than harm the Yemen citizens.

One of the leading occupations in Yemen before the war was fishing, but the majority of boats were small single person vessels meant only for subsistence fishing. While this fed individual families, it didn't do much to help feed society as a whole. Over the past decade, fishing has increased again due to government programs aimed at rebuilding fishing vessels. Building larger vessels would be extremely beneficial, as well as enhancing fishing infrastructure. Many jobs could be restored and distributing locally caught seafood into the community could help hungry families.

Only 3% of land in Yemen can sustain agricultural practices, which may make farming seem like a lost cause. However, other countries have dealt with similarly harsh climates and unfarmable land and have proposed solutions. There are many different methods of desert agriculture. The United Arab Emirates, for example, has only 1% of arable land in their country, and they have embraced vertical farming. This approach uses greenhouses, hydroponics, and vertical structures to maximize yield per square foot. Vertical farming is quite common, and while there is a significant initial investment, it would pay for itself over and over in the long run. Support from non-governmental organisations could help implement vertical farming practices in Yemen, and these farming structures last a long time once implemented.

Once farms, factories, and businesses began to thrive, Yemen could also put programs in place to address food waste. For example, an apple farmer may be tempted to throw away fruit that is too small or bruised. However, these could be made into other products for consumption or market. In areas of severe food instability, even small actions can have a large impact. It's important to keep in mind that fruits, vegetables, and meats can all be dried or frozen and kept for long periods of time. An efficient widespread freezing or drying system within Yemen would be very helpful in making the most of every bite of food.

Programs could be put in place in Yemini schools teaching children how food is grown. Schools could have gardens, or visit local community gardens. Kids could learn how to grow food and learn the importance of nutrition. If kids volunteered at school or community gardens, the food could be donated to families in need or even used in school lunch. The World Food Program currently provides school lunch for over 600,000 children, which for some kids is the only meal they get in a day. Potentially adding fresh fruits and vegetables from a garden could put more nutrition into school lunches, or if the school currently had a sustainable and healthy school lunch program students could take crops home to feed their family.

A final idea is to begin to compile a large stock of non-perishables. Some of the stockpile could be available at food banks or be stored for absolute emergencies such as another period of

war or famine. The sad reality of living in Yemen is that even with protection and deals with other strong countries, Saudi Arabia has and could again bomb schools and sacred buildings and has taken thousands of Yemeni lives for seemingly no purpose. Financing for underground bomb shelters for people, supplies, and food could be beneficial in case of another catastrophic event.

Many different factors created the current food instability in Yemen, and it will take multiple solutions to solve the problem. These are just some ideas for what could assist Yemen in rebuilding their economy so that a greater amount of their population goes to bed with full stomachs each night. Even just one of these approaches could be incredibly beneficial, but by expanding outside aid, rebuilding and acquiring supplies, implementing sustainable methods of farming and feeding as well as educating everyone, Yemen could soon be a transformed, food secure country.

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