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Syria: Growing Toward a More Nutritious Life

March 15, 2021 marks the ten year anniversary of the Syrian civil war, which was sparked by a series of skirmishes between civilian lead groups and the government military. Demonstrations protesting injustices made toward outspoken civilians by the ruling Assad government was a key event of the Arab Spring and the fight for more equal government power and citizen involvement in the Middle East¹. Due to the longevity of this war, a multitude of those unaffected have forgotten the crippling refugee crisis that plagues Syria and its surrounding countries. There have been 5.6 million refugees and 6.1 million displaced persons that have been affected by the upheaval that has ravaged their home country and left 11 million in need of humanitarian assistance². Those primarily acting on these people's needs are the surrounding countries of Lebanon, Israel, and Turkey⁴, which have felt the economic and social burdens of caring for so many for so long. Currently, over 2.7 million internationally displaced persons (IDPs) are living in north-west Syria, with the Aleppo and Idlib governorates boasting the most due to their primary access to external aid and international protection³.

In these camps and settlements, the average household consists of five individuals, most of which have become accustomed to their new homes which were never meant to be permanent. Most children have the ability to have a modified version of the Syrian education program in makeshift schools made out of combined tents and in homes, while others are able to outsource to countries such as Lebanon and Turkey for education⁶. These children normally live with their parents until marriage, but if widowed or orphaned, then they will go to live with their closest living relative⁵. In this culture, women struggle to economically maintain themselves due to prejudices and religious beliefs common in Syria⁷. The large death count among those that stay in war zones, mainly those that are sick or cannot leave, have resulted in many chiseled families left to fend for themselves in refugee asylums. Even if they were to attempt a return trip, an estimated 70 percent of health care workers have left the country, leaving Syrian medical centers empty of educated staff and an increased death rate for the infected and wounded. With the inability to return home, Syrian's have started to develop new communities in which to live and make economic profit to sustain themselves and their families. It has been recorded that 75% of IDP households live in finished houses or apartments, 11% in tents and 7% in unfinished dwellings³.

Housing and necessities are generally provided by non-government organizations (NGOs) in these areas because IDPs are unable to create sustainable income. Currently, half of the working age is unemployed⁸ and 64% of workers claim they lost one or more sources of income, while more than half of that reported 75-100% of income lost⁷. This inability to procure income leads to a diminished quality of life with the prevention of acquiring common goods. Not only is unemployment on the rise, but covid-19 restrictions have also halted access to food, both in markets and those imported internationally. This is detrimental to these communities who heavily rely on markets as their primary sources of food as around 30% don't have regular access due to these restrictions⁷.

Even with market access, Syrians still face tarnished produce and a struggling economy. This lack of sustainable agriculture has drastically handicapped the country in its economic recovery process by preventing sellable goods from being made and properly transported. Due to mismanaged farmland in

rural areas, the number of farmers moving to urban areas has increased substantially, adding to the unemployment rate of already heavily populated areas¹. Problems farmers face with large scale wheat and barley production in Syria include: “insufficient rainfall, limited water for irrigation, low availability of good quality seed, field mice infestation in Homs that weakened germination rates, crop-weed competition and the limited access to top-dressing nitrate fertilizer.⁹” Despite these agricultural struggles in mass production, food availability is not the primary issue, but food access⁹. Most families, due to their inability to obtain proper income, are rendered incapable of obtaining overpriced food. The national average food basket in Syria now exceeds the highest-paid official government monthly and is available on the black market for ten times its subsidy price^{10,9}. Syrians cannot resume normal life if all their time and effort is put into finding food for themselves and their families. Additionally, the Syrian currency has also plummeted by more than two-thirds its original value due to inflation of billions invested in Lebanon that was never repaid^{10,9}.

The survival of any nation is built upon its ability to have a flowing economy, which comes from produce that is exported and circulated by the people. Before the Arab Spring, Syria was attempting to reduce agricultural imports and turn them into exports to achieve food-self sufficiency¹⁵. However, nearly 8 million Syrian’s currently live without reliable access to food with an estimated 500,000 children that are chronically malnourished². They cannot afford food as an estimated 87% of households have already depleted what little savings they brought with them or made, forcing families to buy on credit or create negative coping mechanisms, such as not eating nutritious food or skipping meals all together⁷. As a result, 37% of IDP households have recently reported an inadequate diet⁷, which not only affects their physical bodies, but increases stress on family breadwinners.

As society builders, civilizations started due to their ability to create an economy, to produce agriculture, and to boost trade. The same can be applied to the camps and communities of Syrian refugees and internationally displaced persons (IDPs). Theoretically, in the case of communities (thought of in this sense as small countries), if we can provide resources for agriculture to be cultivated, then a new society will grow. There have already been cases of miniature economies being built in larger refugee camps by IDPs who have brought their trade with them, such as bakers and weavers who continue to use their skills to create an income¹¹. One reason that many Syrians have not, or cannot, create their own income inside these camps is because they did not work a job beforehand that was transferable to a settlement type society, such as those that worked with technology, large manufacturing organizations, large scale agriculture, tourism, and government positions. Alternatively, some towns and cities were hastily evacuated, with little time to grab long term items to take with them.

Syria has enough fertile land to support itself, but malicious agricultural practices have resulted in unsustainable crop production, while the war has incurred little change by producers due to the difficulty of merely staying in one area to grow crops. Alternatively, there are four main types of gardening practices that would significantly help to increase yield and quality, while simultaneously reducing water intake and land use. Gardening methods such as the hydroponics wicking system, the Kratky method, cold frame gardening, and old fashioned container gardening each can be used by refugees who need both nutrition and a source of income.

Caretakers for these systems would primarily be targeted to those that cannot provide for themselves or struggle more than the surrounding population. The attention needed for small scaled versions of these gardening methods is minimal, so it would be similar to caretaking of a family garden instead of large scale, highly laborious field work¹⁶. This is why disadvantaged workers would be best suited, such as the

impaired, the young, the unemployed, nomads (if they chose to participate), and underpaid individuals compared to the rest of the community. These methods, and the supplies needed to maintain them, would focus on the most disadvantaged in a disadvantaged community. As stated before, many individuals have managed to create their own incomes and become self-sufficient, therefore, this project's main targets are those that have not been able to recover¹¹. Any excess production can then in turn be used to create income through selling or trade. This project at its bases can be a staple food supply for struggling families, but retains the ability to grow into a business that can interact with the community while also providing key nutrients to malnourished refugees. Each system can be adapted to fit different needs, such as being as large, complex, and healthy as the caretaker desires.

Consequently, Syria has a wide range of weather and climate, from hot, dry summers to mild rainy winters, with occasional snow¹². The area that would be most accessible and ideal for a trial run of this program would be the governorate region of Aleppo, which has an average temperature of 40 F to 80 F¹³. This area can be accessed by the only two cross borders and has a multitude of refugees and IDPs that live in communities to receive data from. That is why such diverse systems are needed to successfully make an impact on Syrian families.

For example, the wicking system does not need electricity, (which is beneficial to smaller communities that have little to no electricity), and consists of five main parts. First needed is the container, which would be split into two parts, the top housing the plant and the bottom which acts as a reservoir for the water solution that feeds the plant above it. A useable container could range from a bucket to a storage container, anything that could contain (and retain) water that is available to the cultivators at the site will be effective so long as it is clean of outside materials. The growing medium, which retains nutrients to the roots, is ideally rockwool, but coco coir chips, perlite, and vermiculite also work well. There is a possibility that another substance could be used that is more natural to Syria that would work well to maintain moisture and nutrients, but none have been recorded. A growing medium for wicking needs to be regularly cleaned to ensure there is no nutrient buildup. There needs to be a wick (hence the name of the method) that transfers the nutrients from the reservoir to the plant. This can be anything absorbent, from paper towels to old t-shirts. Just like the container, whatever is most accessible to the cultivators will work. All that is needed outside of that is the plant, which first needs to be germinated and then placed in the medium solution. The seeds can be germinated in a variety of ways using water absorbent products (like what was used for the wicking) and sunlight. These basics can be easily taught to those that wish to participate and take little maintenance other than washing the media and maintaining the nutrient solution.

The next method of hydroponics is even simpler than the one previously stated. If the media and nutrient method prove to be too costly for organizations or individuals, then the Kratky method is what is needed. This method requires the same container, with a holding chamber for the plant with a reservoir below it. The plants use up the water and nutrients as they grow, maintaining oxygenation levels while growing the plant. This does not need a media and does not waste as much nutrients as the Wicking method and does not need changed water (only added when it gets depleted).

Both of the above methods are considered hydroponics methods, which means they were designed to preserve water. However, during the hot summer months in Syria, evaporation could pose an issue, but could easily be fixed by moving the plant or creating a natural shading shelter. The rare cases of snow in the winter months could also pose a similar problem. This is where cold frame gardening can be added or combined to ensure a sustainable system year round. Cold frame gardening is like a miniature, unheated greenhouse. It requires a wooden or polycarbonate frame, insulation, and a transparent top. The frame can

be used with discarded wood (ex. Doors from ruined buildings). The cover can be made from objects such as transparent table tops and windows. This cover is meant to let light in but retain heat and it will be vital to ensure that the plants don't overheat or else they will wilt and die. Insulation can be used from old shirts, hay, or straw. The insulated nature of this method will help keep cold out during the winter months and help provide protection in the event of a sand storm or other severe weather. This system doesn't require any electricity and plants can be laid inside in pots or buried. Hinges should be added if available, but regardless the top needs to remain movable to allow both ventilation, water, and harvesting access.

The final suggested method is a common container plant. This can be easily moved, only needing soil, light, regular water and drainage. If there is a family or group that moves around (for odd jobs or for shepherding), this is a good way to transport a garden. Wagons, livestock, and vehicles can be used to help transport pots depending on the size of the operation and what is available.

Resources for these "home gardens" that cannot be found or bought should be provided by NGOs. These supplies and aid should be given in trial runs before a large-scale operation is started to ensure that it is successful. The concept of this project is meant for long term use, despite seeming short term in the beginning, it can grow into something more permanent if the caretaker wishes to continue after stabilizing their income and food source. Large scale long term implementations could grow into systems that require electricity, a staff of caretakers, and machinery. There could also be larger cold boxes built or even greenhouses (although they then would have a greater chance of damage from storms⁹).

The plants that would have the most benefit of being grown would ideally be wheat. Wheat can be made into a plethora of different foods and used to be a staple crop in Syria¹⁵. Similarly, Syrian dishes are largely based on what grows best in that climate, so the produce would be familiar crops and not foreign filler food. The wicking system would be most beneficial to grow herbs and lettuces; the Kratky system would grow best lettuces, herbs, peppers and tomatoes (with larger container); a cold box would work well with ground and underground plants; and the container can grow close to anything as long as the plants' needs are maintained.

Aid to Syria has already taken place, but primarily in a short term 'band aid' solution style. Shipments of grains and other non-perishable items to refugees help with feeding the hungry during displacement, but it doesn't solve the lack of jobs for the unemployed or where amassed food for a community will come from. Recently, the Assad Government has reduced the four cross-border aid locations down to two, furthering the lack of aid that can be imported to the country¹³. The UNSCR 2504 agreement has allowed for these two locations to remain open, but access to aid has been greatly reduced for IDPs. The governorate of Aleppo, where many IDPs still remain, has taken a "skeptical attitude toward international humanitarian relief operations in rebel areas (such as Aleppo), seeing such efforts as entrenching enemy forces and sustaining the rebellion."¹⁴

Despite the regulations put on aid, some organizations continue to have regular interaction with IDPs and refugees. The Cross Border Operation focuses on northwest Syria (the focused governorate of Aleppo), and reaches on average 178,000 individuals per month³. This organization also distributes kits for kitchens, tents, mattresses, stoves, and winter items while partnering with many NGOs to get supplies to Syrians in need across the border³. In these import sessions, this project would provide seeds, fertilizer, containers, water, and a means to give the basics of these gardening systems (either by packeted information or by speaker). The Food Security Sector works on the "provision of appropriate inputs for

agriculture, backyard food production, productive asset building, veterinary support, and income generating activities focused on food processing and production (such as flour mills).” This will help teach communities about personal agriculture cultivation and help with set ups⁸. This organization would be more permanent in that they would be major players in teaching sustainable agriculture in large, less controlled settings, such as farms. Volunteers for this would hold a sustainable agriculture class within a set vicinity where a number of farmers live, teaching them how to maintain and grow their businesses. A translator may be necessary depending on the language comprehension of both the speaker and the audience. After major areas have been educated (and possibly gifted with equipment), then volunteers would hit more rural areas. The civil war has upturned many lives, but it has also left most arable land alone for the ten years that the war has raged. Hopefully with this break in aggressive agriculture, the land will be more easily recovered and will have a better future due to the education of its caretakers. Along with laborious support, the UN would serve as a massive monetary input for these NGOs with its influence and global communications. They asked for \$3.3 billion to respond to Syria’s humanitarian needs in 2020, so I would propose an allotment of funds (yet to be determined) from that sum in accordance with long term needs vs immediate action². I would suggest a transition of support for short term action into long term instead. This will help Syrians more with the fact that it is no longer a short term displacement, but that where they are now is their new reality.

Syria is one of the oldest nations in the world, which will continue to exist and prosper. However, it still needs help regaining what it lost to war and societal collapse. For Syrians to do their part, stabilized countries need to play their role in creating a world focused on new realities, not one based on the hope of returning to normal. Applying our past can lead to a stabilized future, one better than before. Syrians know how to be self-sufficient, they only need the resources to do so. Upon this ideal, Syria can heal from its past and grow to a better future.

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