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Tunisia, Waste and Spoilage

### **Tunisia: Combating the Multiplying Loss**

Generally, food waste is seen as a difficulty only faced by wealthy, developed countries, but the truth is, it is a worldwide pandemic and no country is immune. According to the Food and Agriculture Organization of the United Nations, developing countries lose 310 billion US dollars in food waste. The money lost in food waste could be utilized for more important issues like combating the opposing side of food waste, hunger. Tunisia in particular, faces a huge threat from food waste due to poor post harvest containment and lack of proper infrastructure. Due to this combination of complications the people are feeling the effects; thankfully, the government is trying to implement legislation to help reduce the amount of waste. However, there are more actions that could and should be taken by both the government and citizens to diminish the multiplying food waste.

Geographically, Tunisia is the northernmost country on the African continent. Some of the natural borders include the Mediterranean Sea, Sahara Desert and Atlas Mountains. Climatically, Tunisia stays rather dry and warm. During the summer months temperatures can reach a scolding one hundred and four degrees and the winter temperatures do not pass fifty-three degrees. Twenty percent of the land has been cultivated for agricultural use. On this land leading yields produced are; olives, wheat and some fruits. They also use this land to grow and raise sheep, chicken and cattle. Off of the land, various forms of seafood are caught.

Other than agriculture, this land is home to just about eleven million people. These people are governed by a Republic style government. A Republican government is defined as a “form of government in which a state is ruled by representatives of the citizen body. Modern republics are founded on the idea that sovereignty rests with the people...” Just like America, Tunisia has specifications for their president. The most prominent one in Tunisia is, the President must be Muslim. The average family size in Tunisia is about four people. Ninety-nine percent of households are held up with the pillars of the Islam religion. Within the households, nearly all of the population has access to health care and many of them rely on a private health care system. In Tunisia, public education is accessible to everyone, from ages six to sixteen, and this has resulted in a literacy rate of seventy-five percent and one-sixth of the population having a college education. After school, it is time for the citizens to become active roles in the workforce. Twenty-two percent of the jobs in Tunisia revolve around Agriculture and twenty-three percent are in the manufacturing area. The average net wage taken home usually circles around thirty-three thousand dollars (Dinars to USD).

As a whole, the country of Tunisia is facing a huge food waste matter. To put it into numbers, the country waste about 197 million US dollars in food annually and a majority of it is happening before it makes it into homes due to not having proper provisions. In other words, the challenge is maintaining and preserving goods. Dr. Adel Kader, a Plant Physiologist at the University of California at Davis made a fascinating point that “the lack of access to cold chain systems and reliable energy sources required to power them is therefore the major cause of food loss in Tunisia” (Kader, 2005). Due to the lack of infrastructure this causes a major loss in subsistence coming in the country and even product being transported throughout the country. This “cold chain system” unavailability starts before food is sent to grocery stores; it begins when exported food has made its way on Tunisian soil.

For a country that is highly dependent on foreign imports, they do not have a handle on the process of acquiring it. In 2017, Tunisia was a net importer of agricultural products. Popular items imported are

wheat, soybeans, corn, and vegetable oil. However, the existing infrastructure is generally deficient and does not fulfill the produce shipment requirements, especially in rural areas in most countries of the region (Yahia 652). Shipping requirements include loading and unloading spaces into quality facilities for storage and refrigeration. Loading and unloading space is necessary because freights need a proper place to drop off/pick up goods. Quality storage facilities are a must due to the specific needs of particular produce (i.e. potatoes should be stored in dark spaces, overcrowding can lead to rotting, etc.). A refrigerated container for moving and sitting food is obligatory in order to increase shelf life and is important to keep bugs from infecting and nesting. Without these spaces, food cannot make more than two weeks without spoiling, some even rotting before then. This is not the only place where food is being wasted.

Tunisia also faces a food waste issue within households. In order to convey genuine evidence, a survey was taken and published the results in 2016. Sixty-three percent of the people surveyed said that their main problem was leaving food in the refrigerator too long is what led them to throw out their food. Fifty-one percent reported that not meal planning is the reason their food spoiled. The rest of the results were a mix of: poor cooking skills, leftovers, improper packaging and overall not liking the taste. From these results it can be conveyed that the food waste coming from homes is influenced by having too much and not utilizing it or not knowing what to do with it. Not every Tunisian household is fortunate it enough to have food to waste. Some do not have food to eat.

Food waste and its impact do not pass by without affecting the people. For starters, hunger is a concern. Though food is accessible by physical means there are economic means that hold people back from buying it. This is especially a problem in rural Tunisia and households headed by women. This is because these families simply cannot afford to buy nutritious food. Hunger leads to many dietary problems. According to the Food and Agriculture Organization “anemia, or iron deficiency, was estimated at 31.2 percent for women of reproductive age (15-49) in 2016. Rates of this disorder in this demographic have been steadily increasing since 2010.” They go on to say that “approximately 27.3 percent of the country’s adult population (over 18) was considered obese in 2016. This number is over 10 percent higher than in 2000.” It can be seen that anemia and obesity are both major issues faced in Tunisia that could be linked to hunger and malnutrition.

Secondly, landfill waste is becoming harder to handle. According to *Echoing Sustainability in MENA (Middle East and North Africa)* “The country, having an estimated population of around 11 million people, produces more than 2.5 million tons of garbage each year. Tunisia is experiencing an average increase in waste volume by 3% with per capita waste generation in urban areas being 0.8 kg per day.” (Abdulrahman). In simpler terms, Tunisia’s dumping grounds are growing rapidly and they will eventually run out of space. This rapid growth has been linked to respiratory complications from the gases being released and other health risks due to unsanitary conditions. These two effects should drive every Tunisian to make change and in a fast manner.

The Tunisian government has passed regulations for food safety. Some of these regulations include; phytosanitary requirements for unprocessed plant products, sanitary controls for animals and animal products, and consumer and retail protection. Though these laws have been set in place, many things are overlooked, particularly regulations that govern labeling, conditioning, handling, transport, and storage of agricultural and food products (Hass 2). In other words, the government has applied hygienic processes to ensure the quality of food for consumers; however, this alone cannot cure the waste epidemic. As a proposal, amendments could be added to the legislation that imitates the United States’ Food Recovery Act. These amendments would go further than sanitation and would also administer acts surrounding “raising awareness about wasted food and food recovery efforts to reduce the quantity of wasted food, reducing food waste at schools and farms, and installing facilities that include composting or anaerobic digesters that use food or crop waste to produce energy.” In other words, from farm to plate, food will be

used and portioned appropriately. In order to fit specific needs, the Tunisian government would have to revise the piece of legislation to said needs. For example, they may want to focus on post harvest food recovery. This includes, enforcing restrictions on stores having quality facilities for storage to maintain and uphold standard produce for consumption. They could also set an import limit so they are not bringing in too much. Another focus would be to raise awareness. Because there is a large percentage of waste coming within household hold walls, the best medicine is to spread awareness like putting posters in supermarkets and schools. Simplistic tactics like these might make a world's difference.

Another solution would be to raise taxes. This is definitely not preferred by citizens, however, it is necessary to get proper materials, pay for labor and, if thought about it logically, it would only be benefitting the population as a whole. This would only have to be set temporarily because once the building was up and running; the responsibility would rely with the companies using it. For example, to build a new storage facility, it could cost between three to four million dollars. In order to receive the funding, the government could raise income taxes by half a percent and would receive the money within a time span of two to three years. As the capital comes in, the government could start finding laborers and buying materials to start the project. As the project comes to an end, the government would sell off the newly built facilities to grocery store/supermarket companies. From there, it would be the companies responsibility to maintain and upkeep the facilities. Therefore, the money would end up coming back to the government because the building would be bought from them and taxes could be implemented on the companies. This not only helps with food waste but it would also lower the unemployment rate and would bring in business which creates a round circle of cash flow.

The two solutions that lay above might be *the* solutions to Tunisia's food waste problem, but they will never work if the government does not adopt them. Therefore, the biggest and hardest part of these solutions is finding a way to convince the elected officials in office to adopt them even if it makes them unpopular. Speaking to elected officials can be an intimidating task, but it does not have to be. The biggest thing to remember is that it is their job to help the people. First and foremost, it is mandatory to have a plan. In the plan it would be important to include statistics on what is going on now, a solution and potential outcomes. A great example of a plan is the information above. Secondly, prior to meeting do research on the opposing side. In other words, find the answers to questions that might be asked to deteriorate the argument. Lastly, to ensure that the information shared sticks with the elected official, bring a handout so after the meeting they can reflect on it and they will have a constant reminder. With this information, leave contact information because if they are interested, they could want to talk further about it. As a tip to the speaker trying to convince an elected official, do not feel defeated if they say no or question the plan because if they do the job is not done, there are things that could be done in the community.

As a recommendation, composting would be an easy and efficient way to reduce the amount of waste going into landfills. Composting is the process of recycling organic materials to create decomposed matter. Organic materials include grass clippings, fruit and vegetable peels, leaves, and even newspaper. In order to make the decomposed matter the organic materials will have to sit together and be mixed frequently (every two to four weeks) in order for it to aerate and to let it build heat. The time that it takes to for the compost to break down is dependent on the size; the larger the pile, the longer it will take for the materials to break down. This could be very effective if communities partnered with local farmers and gave them the compost to help fertilize their soil to increase their crop production.. The compost could not fix everything, but if it became a community initiative, it could knock two birds with one stone by helping fertilize the soil naturally and decreasing landfill waste.

As seen from the statistic earlier, over half of the households said that their food was thrown out because they did not plan out their meals. Therefore, another recommendation that could be taken to the citizens is meal planning classes. These classes could take place in universities, community centers and churches.

Universities are great places to hold these classes because these students are usually living away from home and will eventually be living on their own full time. For that reason, meal planning would be a necessary skill for students to use. The reasoning behind holding classes at community centers and churches is that these are places that a large amount of people gather so, it would be easier to obtain an audience. Now that there are potential places for these lessons, there has to be actual lessons. Within the lessons the “students” would not just be taught on meal planning itself, but also; proper storage of food and the importance of portioning. All of these lessons are essential pieces of people understand everything it takes to make and store food. The last piece of the meal planning is finding someone to teach the lessons. Prospective teachers could be anyone who either lives by meal planning or someone who has studied food or nutrition. These teachers would be great alone but if possible, even better together because each has something special they could add. Someone who lives by meal planning could give their tips while a food expert or nutritionist could make recipes, serving sizes and what foods contain different vitamins and minerals. Hopefully when all of these parts come together, household food waste will drop dramatically.

With these new solutions and recommendations, it is only evident to see change starting to happen. One main change is to see more money being saved by both the government and households. Households could use this money to help supplement their own needs, but the government could use their kept capita to start focusing on another food affair, hunger. Hunger is a colossal problem, but just like food waste, small steps could make the biggest changes. For instance, the funds now available could go toward Community effort: second hand bins at farmers markets, grocery stores and community centers. These should not be used for profit but for people who cannot afford to buy produce. The bins could contain ugly fruits and vegetable that no one is willing to buy or items that are about to hit their expiration date but are still edible. On a bigger scale, extra money could also go towards temporary government supplements to help families with buying necessities. Also on a larger scale, the idea of meal planning classes could be used and turned into funded cooking classes in elementary and middle schools so; students can learn at a young age how to properly prepare nutritious food. Hopefully, they take in these skills and use them throughout their life. They might even have the opportunity to teach their family and friends their new found knowledge.

In conclusion, Tunisia is a North African country that is diverse in many ways. It tends to stay fairly dry and the winters usually never go below fifty degrees. Their home life surrounds the Muslim religion and the basis of education. The majority of jobs performed surround agriculture and manufacturing. Ironically, both fields are a factor to the country’s insecurity of food waste. Proper crop management is tough due to the rough climate of the country; however, post crop harvesting is also a factor. A lack of proper infrastructure and management can lead to food rotting, infestation and overall it leaves the food that cannot be consumed by humans. Also due to hunger, many people go hungry everyday and face diseases because of poor waste management. As a solution, legislation much like the US “Food Recovery Act” should be put in place to set precedents on food management. Another solution would be to raise taxes temporarily to buy needed equipment for new infrastructure. For the people at home, two recommendations would be to compost and meal plan. Compost can help reduce landfill waste and renourish the ground, but there is more that can be done so eliminate some of the food being thrown out and this is by meal planning. Meal planning does require some extra moving parts, but with time and effort, its results will have long lasting effects. For example, not only would “students” gain knowledge on how much to buy, but they would also be given recipes and lessons on why it is important to portion out meals. Food waste is a tricky disease that does not have a vaccination, but with proper care, determination and time, the symptoms will start to fade.

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