Sustainability in Turkey's Agriculture Industry

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Introduction and Background

The country of Turkey is a large peninsula that connects the continents of Europe and Asia. Surrounded on three sides by the Black Sea, the Mediterranean Sea, and the Aegean Sea, Turkey covers an area of 783,562 km^2, also being larger than the state of Texas (National Geographic, N/A). Turkey is a republican parliamentary democracy, and the only country with a Muslim majority population of 99.8% (Balkan Heritage Field School, 2023). Turkey is famous for a diverse set of both oriental and European elements, such as its Turkish Tea, carpets, hammam and bazaars, and sweet treats like Turkish delights and baklava (Explorer, 2023). By using these facts to create an image of what the nation looks like, an individual can better grasp the significance behind the push for agricultural sustainability in Turkey.

Reason for Research

The nation's unique and alluring background provided a foundation of curiosity, serving as the main reason for being the spotlight of this research. I have always been interested in agriculture industries and have an agricultural background, leading me to be inquisitive about sustainable agriculture around the world. The United States, even if we take it for granted, is so deeply developed technologically in our agricultural industry that when looking beyond our borders, it's almost unbelievable the difference to be seen. In terms of the global race of agriculture and its supports, Turkey is known to fall on the low end of the spectrum, needing assistance in all aspects of keeping the nation's agriculture industry consistent.

Dependence on Agriculture

In Turkey, family is the main social structure that the nation revolves around. A traditional Turkish household often consists of two parents, any unmarried children, and

sometimes, married sons with their families (AFS-USA, 2023). This common formation applies pressure to the demand on agricultural products, as each family depends on the industry aggressively to thrive, or even, survive. However, the solution of this goes beyond the need for an increased supply available, and there are a plethora of roadblocks that lay in front of the farmers, machinery, and equipment of the industry. Initially, Turkey's economy is falling to pieces, causing factories and farms to be financially ruined and stunting growth within two main supplies of jobs and food. Simultaneously, HIV and Aids are also an impactful problem in Turkey, as 15.4% of the population between ages of 15- 24 are being affected by the viruses, inevitably causing poor nutrition throughout the country (Kaya, N., 2021). Alongside these downfalls, Turkey has a troubled political relationship with the EU, primarily within the boundaries of trade, which has reduced significantly and affected many industries the nation depends on (Human Rights Watch, 2022). As a result, the rate of exported and imported necessities has decreased over time, only allowing for the need for change to intensify further. To add on, the annual rate of inflation is increasing within the nation, exemplifying yet another example of economic instability. From June 2021 to June 2022, inflation reached to 78.6%, while food prices doubled and transport costs increased by 123% (Economist Intelligence, 2022). Turkey also is the G20 member with the highest baseline water stress level, since 73% of Turkey's total water supply is used for agricultural irrigation, rather than being recycled or reused (Food Sustainability Index, 2023). This statistic proves that the system the nation has in place is not successful outside of the agricultural sector, which is only harming the forward-moving gestures as a whole. This leads to an area needing attention, one of which could have limited answers.

Inefficiency Prevents Success

The lack of recycled water in Turkey is solely the issue that unravels within the knots the nation has tied. The main problem to be addressed when everything is broken down is the shortage of water in Konya, Turkey, simply yet complexly caused by insufficient irrigation practices. 94% of water in Konya is used for agriculture purposes as it is and the country is experiencing record low water levels (Irrigation in the Mediterranean, 2019). This data leaves one to ponder over such inefficiency, no matter how the crisis is viewed. Nonetheless, one thing is clear; the shortage of water due to inadequate agriculture systems affects Turkey's food supply in many ways. Farmers are forced to grow non-water dependent crops which causes the supply and demand 'pully-system' to increase prices. Crop yields are decreasing as well, as livestock productivity is causing inferior nutrition throughout the country. Moving beyond the midpoint of the issues, low water levels in Turkey affect families and the whole country in many ways as well, as they limit access to safe water for drinking and practicing basic hygiene. When water levels are low, sewage systems can fail and the threat of contracting diseases, such as cholera, increases.

The Potential Solution

A question that is easily derived from the negativity of the given numbers could be; What is the reason behind the delay for a solution? Turkey grows a variety of crops such as wheat, sugar beet, tomatoes, barley, potatoes, grapes, maize, watermelons, and apples (The World Factbook, 2023). All of these crops need large amounts of water to grow, resulting in Turkey being forced to use irrigation from its lakes and rivers to grow these crops. Because this 'bandaid' has only dug the hole deeper, Turkey must circle back to a

more manageable response. An individual on the outskirts looking in on the problem has the potential to oversee a common denominator, and hopefully, spin it to cover all the factors that are caused by the singular argument. My initial solution to the water shortage in Konya, Turkey, caused by meager irrigation systems, would be to install high-scale hydroponic systems in both large and small farms. Hydroponics use 10-16% less water than irritation systems, immediately and positively affecting the water shortage (Venter, 2017). From the counter perspective, a logical and reasonable concern is the current water shortage only getting worse by applying more pressure on water systems, such as the implementation of hydroponics. However, with help from The International Water Association, Turkey will receive grants and donations to cover the cost of the hydroponic systems for large scale farming, covering the economic downfall and an increased water shortage that could arise. The overall analysis of the solution is that the average cost per machine would be around 1 million dollars in cost. Although that seems like yet another roadblock, that too has its own explication to the complicated equation. With money raised through the organization, large and small hydroponic systems, built by the U.S. company Hydrobuilder, will be sent to Turkey. As more money is raised, hydroponic systems will gradually be incorporated into small farms respectively. The units will be delivered by air, land, and sea through United States shipping companies. United States engineers and volunteers will help build and construct the units in order to assist with the labor costs of implementing the solution. Large filter systems will also be installed to control the level of Ph in Turkey's fresh water, which ensures the crops are receiving proper nutrients. Once the units are in place, Turkey will receive help from the U.S. in order to start a "Fight for Hydroponics" organization, with the goal of raising money for

the maintenance and upkeep costs of the hydroponic units. Courses will also be offered to all farmers switching to hydroponics to instruct them on how to maintain and fix their systems to keep them running for years to come. A years worth of products will also be distributed in order to maintain and service the systems. This list of solutions is only the beginning of what the country could explore and experience with the help of high-level nations that experience sustainability of their own.

Conclusion

Personally, the aim for this research is explicitly to broaden the possibilities for the nation. It is evident that no matter what, some level of severity in terms of the water shortages will remain, and the struggle the industry has faced for so long will not evaporate entirely. Regardless, any effort that looks beyond the horizon for the nation is an effort to develop the nation and everything it has to offer, which should always be the main goal.

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