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Turkey, Factor 2: Water Scarcity

Water Scarcity in Turkey

Background

With the world's population rising quickly, farmers and scientists have worked hard to find new ways to be able to use efficiently and sustainably the fresh water that is available on this earth. In many countries, however, farmers continue to use old styles and techniques to farm that are thousands of years old. The world is reaching a breaking point in which combinations of a quickly rising population, desertification, climate change, and horribly long-lasting droughts are forcing the world and its farmers to adapt. The problem of water scarcity is continually getting worse, and, as *Time* magazine wrote in its December 2014 issue, "Already, 1.2 billion people, or nearly a sixth of the world's population, live in areas afflicted by water scarcity, and that figure could grow to 1.8 billion by 2025" (58). Because the need for water is great and all people are thirsty, the world needs to begin to do something about the increasing need for fresh water supplies. Turkey is one of the many countries around the world that is currently facing water insecurity and needs to begin to start finding alternative ways to save water.

Turkey is home to an estimated 77.7 million people and is approximately 301,382 square miles in size which is slightly larger than the state of Texas (Infoplease). The country is home to diverse topography with includes many mountain ranges, forests, coastline, and its inland tundra, that is partial desert and partial fertile land (Infoplease). During the months of April to August, Turkey experiences very little precipitation and its temperature averages around 75 degrees Fahrenheit. Turkey is a peninsula surrounded by three major seas: the Mediterranean Sea, Aegean Sea, and the Black Sea (Infoplease). It receives an average of 25 inches of precipitation annually primarily in its mountainous regions and coastline bordering the Black Sea (Serhat).

Average Family

Since 2012, children who are born or live in Turkey are required to attend school from the age of five through age of sixteen (Education System in Turkey). The public schools are all fully funded by the central government, and account for approximately ten percent of the central government's annual expenses (Education System in Turkey). Most families have either two or three children with a mother and father (Infoplease). The average life span of people living in Turkey is around 75 years (Info please). In the book *Hungry Planet*, Peter Menzel reports that a typical Turkish family spends $145.88 (US dollars) on food each week, with a diet consisting mainly of grains, fruit, vegetables, and nuts (253). Very little of the food that they eat is meat, fish, or eggs. Over the past few years health care in Turkey has become dramatically better, particularly with the Family Medicine Program that began at the end of 2010 and assigned every patient to a certain doctor near them (Health and Development). Health care in Turkey continues to improve due to the Turkish government's implementation of the European Health Policy into the health care system within Turkey for the past two years (Health and Development). Since the economic crisis, it has become much more difficult to get a job. Unemployment rose and has now come down to being just over 10% (Infoplease). In the rural areas, however, there are many available jobs on farms and working in the agricultural industry ("Turkey-Agriculture"). Since the mid-2000s the number of people living under the poverty line has decreased (Turkey-Industry). Turkey is self-sufficient in terms of food, and the ability to access it is quite good ("Turkey-Agriculture").

Current Situation

Currently due to the Syrian civil war hundreds of thousands of Syrian refugees are flooding across the border into Turkey without many belongings. Turkey has begun to set up refugee camps for the refugees

(Hummer). An estimated 1.6 million Syrian refugees are currently displaced in the southwest parts of Turkey (Hummer). The Turkish government is struggling despite aid from the UN to continue to be able to provide and support all of the refugees with shelter, food, and water (Hummer). The refugees are just another source contributing to the dwindling access to water within Turkey.

During the winter season each year Turkey experiences high levels of precipitation, which accounts for the majority of the precipitation that Turkey gets annually (Infoplease). Starting in December of 2006 and lasting until November of 2008, Turkey experienced a major drought that lowered the levels of its water reservoirs and dams by over 50 percent (Kurnaz). In late 2012 Turkey experienced a mild drought and in the fall of 2013 the drought worsened and spread out across much of the southern and central areas of Turkey (Kurnaz). As Levent Kurnaz stated in his article, "Drought in Turkey", "The cumulative precipitation for all of Turkey between October 1, 2013 and January 17, 2014 was 37% less than the long-term average and 47.4% less than the average for 2013" (Kurnaz).

Economy in current situation section

In Turkey agriculture is one of the largest industries, and it has recently emerged as one of the world's largest exporters of food. Over the past few decades much of Turkey's economic growth is a result of its agricultural production ("Turkey-Agriculture"). Presently, the agriculture industry makes up twenty percent of the employment opportunities in Turkey (Agricultural output). While agricultural exports only accounted for 9% of Turkey's export earnings approximately, 50% of the manufactured exports also originate in the agricultural sector ("Turkey-Agriculture"). The average size of a farm is six hectares, which is big enough to have a surplus of the crops being grown (Info Please). Turkey produces and exports the greatest amount of agricultural products in the Middle East and North African regions ("Turkey-Agriculture"). Also it is one of the world's top ten producers of fruit, wheat, and cotton, as well as a top five producer of vegetables and tea ("Turkey-Agriculture"). Yet, due to the drought occurring from 2006-2008 as well as the current drought, the agricultural industry has seen losses. In the first official crop estimates for 2014 it was expected that the amount of grain produced by Turkey that year would decrease by 10.1% and that production of fruit would fall by 4.5% from the previous year (Agricultural output).

Problem

For a long time Turkey has faces relatively little trouble managing its water resources due to an abundance of annual rainfall (Kurnaz). In fact, Turkey utilizes approximately 70% of its fresh water for the irrigation and cultivation of its crops (Kurnaz). In the current drought, however, many of Turkey's reservoirs and dams have been drained in order to water the crops (Kurnaz). The majority of the dams and reservoirs in Turkey have dropped below 50% capacity in 2014 and consistently seen decreases (Kurnaz). Since there is normally an abundance of water and no need to irrigate and regulate usage among farmers, the current drought environment is one in which water is being wasted and not used correctly (Kurnaz). For thousands of years farmers in Turkey have been able to grow crops without the need for irrigation; however, Turkey's drought, rising population, and increase in crop production will combine to prevent farmers from continuing to use the same methods that they have been using (Kurnaz). Turkish farmers now need to irrigate and use their supply of water more effectively.

Irrigation in Turkey

Turkey has started to use more irrigation, but it is still very wasteful with water. Up until now these poor irrigation techniques have not caused serious difficulties (Kurnaz). Currently, the use sprinklers and drip irrigation is very low in Turkey since farmers have had little incentive to adopt those types of irrigation techniques ("Turkey-Agriculture"). One of the most common techniques of irrigation used by Turkish farmers are canals to guide the water in the direction that they want it to go (Kurnaz). Unfortunately though, very few of these canals are covered, which leads to high levels of evaporation of the water before it can even be used (Kurnaz). The situation is the same in the reservoirs and the dams that hold

fresh water where the evaporation leads to great losses over time. (Kurnaz). As Levent Kurnaz writes in "Drought in Turkey", "A significant amount of this irrigation is done simply by letting water flow onto the fields" (Kurnaz). This technique is very wasteful and if changed would save large quantities of water for Turkey.

Solution

The best and most clear course of action that Turkey could take would be to implement better forms of irrigation and decrease the amount of fresh water that is wasted annually due to evaporation. In recent decades, many large advancements have been made in the technology to irrigate crops without using large amounts of water.

Probably the best way for Turkey to irrigate is through the drip irrigation technique. Drip irrigation was first developed in Israel about 40 years ago and has since been implemented widely across the country (Kolom). In the last 40 years Israel is one of only two countries to increase the size of its agriculture and forests area coverage (Kolom). This is largely credited to the high usage of drip irrigation there. Israel is a country that, like many of its neighbors int the region including Turkey, has begun to see a greater demand for water. Consequently, it began to try to find ways to use its water more effectively. The use of drip irrigation has completely transformed many areas of the world that originally were not as fertile into places that could produce crops. The biggest problem though with drip irrigation is its high cost of installation. In Turkey it costs an average of $200 (US dollars) per hectare to install (Joint FAO). This displays how difficult it would be for the average farmer to be able to switch to drip irrigation from his or her original methods of cheaper irrigation. It may become necessary for the government of Turkey to step in and help farmers with the expense since the agricultural industry uses so much (about 70%) of Turkey's available fresh water ("Turkey-Agriculture"). So if the government truly finds itself in a situation of a dire need for water, then helping farmers be able to change to drip irrigation would be an effective solution. This policy may need to be implemented sooner rather than due to the fact that Turkey is experiencing a severe drought and rising population. If drip irrigation was used on a wide scale in Turkey it would save an estimated 60 million dollars of savings annually (Joint FAO).

While using drip irrigation techniques would be primarily the responsibility of the Turkish farmers, the best way that the government can get involved would be to work on the use of canals and ways to stop evaporation from dams and reservoirs filled with fresh water. Currently in Turkey one of the most common ways to irrigate fields is by just opening canals and letting the water flow into fields (Kurnaz). Before the water is actually used in these canals the water is stored in reservoirs and dams. During this period the water just sits and gets easily evaporated. If the government were to cover these, water losses would be limited with less evaporation leading to more water availability. This is a course of action that the government could take now if they want to help conserve water.

While drip irrigation techniques and government projects and funds would help save water, the main goal for Turkey is to use its limited fresh water resources most efficiently in order to avoid a water shortage. The biggest savings in water usage are to be found through better irrigation techniques. Farmers need to install and use drip irrigation to use less water to grow their plants. The government can also sponsor projects to enclose fresh water dams and reservoirs to limit evaporation. Although there are many challenges to be faced by Turkish farmers and the government of Turkey in the implementation of these techniques, by working together the government and its people can identify best practices and take effective action. If the county pretends that the water shortage will go away on its own, Turkey may be left looking for water where it can no longer be found and subsequently be unable to provide fresh water for its agricultural needs. The need for water is already great and rising; therefore, Turkey needs to adapt by implementing water conservation techniques, particularly in its agricultural sector.

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