**Introduction**

Through your front door, past your foyer and into the kitchen, you usually find a sink with running water. Alongside this sink, you usually find a fridge filled with water and nutritious food like fruits and vegetables. Many people are fortunate enough to not have to worry about dehydration and access to clean water and healthy food. Iranians do not have this luxury. Iran is a dry, mountainous country in southwestern Asia that consists of mostly desert plateau (Afary). This being said, the country is extremely dry and access to clean water or any water at all is sparse. Iran’s water supply is mainly sourced from groundwater, but it is hastily depleting with an annual deficit of over 30 billion cubic meters (Kowsar). With the population surge over the past century and the population expected to surpass 100 million by 2041, the ongoing water scarcity issue in Iran is an extremely alarming problem (Kowsar). Iran is an agriculture country that needs farms to thrive, but without access to water the farms are unsustainable which leads to food security issues. The once thriving country is in its darkest days with millions struggling to stay afloat and hydrated. The demand for water resources is not supported by the country’s geography or governmental policies and the need for a solution is now. Innovative solutions are needed to bring aid to the fight against water scarcity in Iran to improve living conditions for the growing population and to keep the agricultural industry afloat.

 **Government in Iran**

Before going into the causes and solutions for water scarcity in Iran, it is important to understand the government system. Iran is an Islamic theocracy that has executive, legislative, and judicial branches which are all overseen by several bodies dominated by the clergy with the highest-ranking clergy being the “rahbar” or the leader who acts as the head of state (PBS). This governmental system came into place in 1979 when a new constitution was formed and established that law must be abided by Ja’fari Shia Islam and follow the Sharia (Afary and Mostofi). The executive branch holds the most power in the government. The supreme leader and president make up this branch and they are responsible for governing over the other branches (Afary and Mostofi). The Legislative branch is made up of the Islamic Consultative Assembly, also known as the “Majles” and the Council of Guardians. The Majles is made up of 290 directly elected members and the Council of Guardians is a 12-member body of Jurists. The Majles drafts legislation and policies while the Council of Guardians interprets the constitution and ensures that anything passed abides by Islamic Law (PBS). The last branch is the Judicial and it is made up of a Supreme Court and lower courts (Afary and Mostofi). The role of this branch is to settle disputes and make decisions based on Islamic Law (Afary and Mostofi). The government plays a significant role in creating water scarcity, water insecurity, and food insecurity in Iran through their policies.

**Iran’s Geography**

Located in Central Asia, Iran is bordered on the Northern side by the Caspian Sea and on the Southern side by the Persian Gulf and Gulf of Oman (“Geography”). Iran has two main mountain ranges: stretching from east to west is the Alborz and from northwest to southeast is the Zagros. Along with these, the Elburz runs along the Caspian Sea and the Central Makran Range runs next to the Zagros along the coast of the Gulf of Oman (“Geography”). Every area in between these mountains is desert terrain. Urban and agricultural settlements are located on the mountain plateaus (“Geography”). These plateaus are mostly cut off from water sources besides groundwater. As good as their geography is for feeding off foreign invasions, Iran is a country that has bad geography for a civilization to thrive in. The geography of Iran is a large cause for water scarcity in the country due to most urban and rural sectors being located away from any large water source, apart from groundwater.

**Iran's Demographic**

Iran's government changed in 1979 due to the Iranian revolution and with that came a promise from the government ensuring change for all Iranians. The goal was to grant western freedoms to Iranians and redistribute the wealth among citizens through democracy. This worked for a few years, with the country experiencing economic booms with their oil industry (their main source of income) and with social changes that aided the impoverished. In the late 80s, the fall of the Shah and the Iran-Iraq War caused the economy to fall and oil prices to collapse and alongside the new redistribution policies, this all caused the average family in Iran to suffer from inflation, unemployment, and ultimately poverty (Rahmani). Once Ahmadinejad was elected as president in 2005, welfare programs started, but once funds ran low, only the most impoverished were helped which today is about one third of the population (Rahmani). Currently the average monthly income in Iran is about 25-35 million Iranian rials which is about $600-$800 U.S. dollars, but this income varies on location, education, economic conditions, and many other factors (“Average Salary in Iran - Complete Guide 2024 - TimeCamp”). To put this wage into perspective, the average cost for a family of four to live for a month without rent is about $1,244 U.S. dollars, but this varies from sector to sector (“Cost of Living in Iran”). The income compared to the cost to live is exactly why poverty is consuming Iran. The percentage of people completely below the poverty line is over 30% and keeps increasing (“Iran Poverty Rate Reached over 30% since 2018”). The unemployment rate and inflation is regularly in the range of 20% annually, which is extremely difficult for the county to function well (Afary). This leaves a large chunk of Iran’s population impoverished and struggling to get basic needs like food, shelter, and water.

**Iran’s Family Life**

Iran is a country rich in culture, tradition, and religion. Family life is mostly ruled by Islamic law and tradition. Family is honored over all else along with respect for elders (Rossetti). While gender roles have changed overtime, traditionally the father is the head of the household, the mother is expected to care for the home and children, and they both are expected to make sacrifices for their children and provide good education for them (Rossetti). Religion is life for people in Iran with almost 98% of Iranians being Shi’ah Muslim (Rossetti). Family systems, education systems, and all of life is governed by religion.

The main agricultural crops are wheat, barley, corn, rice, and different fruits and fishing is also common for domestic use and export (“Iran - Agriculture, Forestry, and Fishing”). Due to the climate and terrain of Iran, livestock is also a large industry for many people. Goats, cattle, and poultry are the main food animals, but camels are also bred and raised for transport (“Iran - Agriculture, Forestry, and Fishing”). Iran is a beautiful country with educated people, but with a lot of the country being impoverished, there are some not so beautiful aspects to family life. It's common in the poorer sectors to see people selling their newborn children, bodily organs, kids begging for money and people staying back to help their family instead of getting proper education and advancing in life (Rahmani). Family life is very mixed in Iran due to governmental policies and economic issues, but one thing almost all Iranians struggle with is access to water.

**How Iran’s Demographic and Family Life is Impacted by Water Scarcity**

Even before the government change in 1979, water insecurity was an issue for Iran. Over the decades, it has grown into an even larger one. Over 90% of Iran’s population and economic production is located in areas of high water stress. The use of the water they do have access to  goes to agriculture with about 93% being allocated to this sector. The remaining 7% goes into domestic use, but water quality outside of urban areas is significantly decreasing. This is causing mass migration to cities, creating even more issues (Lazard). This is highlighting that the main part of Iran’s population is in urban areas that lack water sources to support the massive number of people. The agriculture industry has suffered as well with this lack of water. Many families that previously survived off of farming have now flocked to urban areas, leaving their farms behind. With the population increase and the urbanization increase, the agriculture industry cannot keep up and Iran grows more food insecure. Protests have broken out “over the price of eggs and basic goods…in more than 140 cities across Iran,” (Madani). The migration of families and the switch of a once agricultural country to an industrial one has vastly impacted life in Iran through raised prices along with unemployment. All of these daily struggles are caused by the lack of water available to Iranians.

**The Challenge and Impact of Water Scarcity in Iran**

Water scarcity is an extreme problem in all parts of Iran. Provinces like Sistan and Baluchistan, Kerman, Fars, Isfahan, Southern Khorasan, Hamedan, Yazd, Khorasan-e Razavi, and Semnan face widespread water poverty due to disappearing lakes, groundwater depletion, and contamination (Kowsar). Urban areas and rural areas throughout these provinces are impacted with this issue. With 8% of Iran’s annual water consumption being higher than their renewable water resources (Azadi and Mesgaran), the crisis is continuing to grow out of hand and millions are without access to water. Groundwater is not renewing itself and other water sources are unattainable to most of Iran. With unemployment rates at an all time high and citizens fleeing for large cities, the agricultural industry is struggling and now both rural and urban areas are having issues with obtaining water. This is leaving a lot of Iran with food security issues alongside their water security issues. A study by the National Library of Medicine showed that 49.2% of Iranians in the study suffered from food insecurity (Daneshi-Maskooni et al.). Access to good food and water is imperative for the survival of people and Iran needs help.

**How the Iranian Government Plays a Part In Water Scarcity**

After the Iran-Iraq war, officials focused on unnatural dam construction and increased groundwater extraction, despite environmental concerns (Dagres). Now the groundwater is depleting rapidly and the majority of dams are in bad condition, not to mention they disrupt natural waterways. Despite this being an alarming issue, the legislative and executive branches are keen on adhering to their “water mafia” policy in relation to the Islamic Revolutionary Guard Corps. After the war, the IRGC, which is non-government-affiliated, focused efforts on the Karkheh and Gotvand dams in the Khuzestan Province (“The IRGC and Iran’s “Water Mafia ""). Partnering with Mahab Ghodss, the IRGC lobbied members of the Majles to push the building of more dams. These two bodies make up the water mafia. Its agenda is focused on winning projects and keeping most of the profit while building cheap dams. The Gotvand dam is an example of this due to its location being in an area where salt beds lay and the salt would rush the Karun River- a major water source for Iranians (“The IRGC and Iran’s “Water Mafia ""). The government listened to the two powers and let the dam be built and it ruined a major water source.  It is clear that the water issues in Iran run deep into the government and without change, the country will continue facing water scarcity for a long time.

**Solutions to Water Scarcity in Iran**

With millions of people in Iran suffering the consequences of the lack of water, the time for innovative solutions is now. Creating new waterways is a good start. It has been proven that natural based solutions, unlike dam constructions and water transfers, are efficient and cost effective to reserving water (Kowsar). The Iranian government has focused solely on developing man made waterways without allowing the environment to catch up. Laying back on these systems would increase water to the provinces. Part of this solution also lies with preventing the government from creating more dams. The Chamshir Dam was just completed through the waters of the Zohreh River and when the water flows, the river will be polluted with salt just like what happened with the Gotvand dam (Farda). This will limit access to this river across the whole country and all because the IRGC has power over the legislative branch. This is a solution that would be hard to implement due to how deep rooted the IRGC is in the Iranian government, but with time, waterways can be reestablished and rural and urban areas will be able to have better access to this water again. By focusing on the growing urban areas and the areas dominated by agriculture, the water can be better put to use for Iranians needs. Desalination efforts are also a good solution to the water scarcity issue. This is a solution which has been enacted in the past, but is growing in modern times. Iran's National Water and Wastewater Engineering Company is operating and constructing 95 water desalination plants across the country and along different coasts (“75 Water Desalination Plants Operating across Iran”). These plants are able to pump tons of salt water through each day and it is sent off to both the agriculture and urban centers. This helps Iranians to not rely on the depleting groundwater as much and use the surrounding oceans to their fullest potential. Although the number of these plants is small, this is a huge step forward in fighting water scarcity. The government could also devote more of the national budget to funding these plants. The only major downside to these plants is the environmental impact. The byproduct from removing the salt is called brine and it can degrade coastal and marine ecosystems (“Towards Sustainable Desalination”). As long as the plants are being mindful of the environment and safely disposing of brine then they are a great solution to water scarcity.

**Solutions to Food Insecurity in Iran**

Water scarcity is a major factor affecting food insecurity in Iran. With the lack of water in agricultural centers, plants and livestock cannot thrive and it limits food options in Iran. A solution for this is providing community outreach to farms. Government funded projects in Iran or from other countries to teach farms how to use less water when growing crops. Teaching better farming techniques could utilize less water to grow more food. Implementing high tech irrigation systems, drip irrigation systems, and recycling water could also aid in preserving water (Bressa). Although these solutions are expensive, looking into smaller scale implementations of them would be a start. A different approach to helping improve food security could be to introduce a different protein source to the mainstream market in Iran. This source could be bugs. They are normalized in some provinces, but not in many. It takes over 2000 gallons of water to produce one pound of beef and it takes less than 12 gallons of water to produce one pound of insects (“Edible Insects”). This would drastically preserve water that is allocated to livestock and would be able to feed a massive percent of Iran, not to mention they are nutritious. Locusts and damselflies are native to the area and are able to be mass produced. The only large issue would be to break the societal norms against eating insects, but with how society is progressing this could be an option in the near future.

**Conclusion**

Water and food insecurity is an ever growing struggle within Iran with about 30% of the population facing this plaguing issue. Having access to healthy and safe water at all times is a natural right that should be given to every human. These issues are mainly impacted by the geography and government in Iran. Enacting better governmental policies, establishing desalination plants, improving water management on farms, and introducing bugs as a larger food source are all solutions that would aid in solving these issues. Every person deserves access to fresh water and healthy foods. Implementing these solutions are a large step in the battle against water scarcity in Iran.

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