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Ireland, Water Scarcity

Ireland: Salty Water Problems

Ireland's water scarcity problem stems from environmental factors and lack of deep fresh water sources. The decrease in rainfall has had negative effectives on the country. The impacts are not catastrophic but irrigation will become more important in the Eastern part of the country in the future.

Ireland has a population of 5.033 million, 63% of the population is urban, while 42% is rural. Per household there are 2.6 people on average. Ireland has large cities like Dublin, Belfast and Cork. The rest of the country is semi-rural or rural. Ireland has a parliamentary democracy, a parliamentary democracy is a form of government in which the legislature forms the government, and the leader becomes the prime minister or the chancellor. Ireland's current leader is Micheal D. Higgins, he was elected in 2011.

Ireland's land cultivation is 64%, the main crops are wheat, oats, and barley, they export beef and dairy products. Ireland is still the number one producer of the potato. In the future this may change as the water changes because there will be more irrigation required. The country does not produce soybean as it is not suitable for commercial production. The weather plays a large part in soybeans not being used for commercial production because of the early onset of winter each year.

The average farm in Ireland is 80 acres (32 hectares) or 60.61 football fields. The climate is maritime, a maritime climate has a mild temperature, they have warm summers and mild winters. Ireland's geography is known as an island northwest of Europe in the North Atlantic ocean. Ireland is nicknamed the Emerald Isle, thanks to its lush, green fields. Even though there are large areas of fields Ireland also has some rugged, rocky areas. The rocky areas of Ireland that are not suitable for agriculture are used to raise livestock such as sheep and goats. While these are not exported they are used locally.

As mentioned above the household average is 2.6 people. Most dwellings are usually three to four bedrooms and semi detached, in the city areas, houses are usually terraced or rowhouse, while free standing or detached houses are more common in towns and villages. The more traditional houses are usually made out of wattle and daub, which is made from mud, manure, and straw with timber beams. In the urban areas there is a program called Community Gardens Ireland they help promote, facilitate and enhance community growing. There are approximately 2500 allotment sites and community gardens provided by local authorities.

A typical family diet consists of potatoes, grains, and dairy products, along with soups, seafood, and meat. Families get their food from markets or nearby farms. Families that own farms tend to be self-sustainable and do not always need to shop from markets. There are four main grocery chains in Ireland that service the urban areas. The four grocery chains are Aldi, Tesco, Lidl and SuperValu. The average wage in Ireland is $44,202 per year (53,083 euros), and $4423 per month (3,683 euros). In a study done in 2018 by the NDP the average meals cooked at home were 82%, this is significantly more than a decade ago. Eating out dropped to an all time low during that time. Despite many claims the statistics for drinking

have reduced on a daily basis as well. For the total population there is an estimate that only 1.6% of men and .2% of women are drinking daily.

There are skill shortages in Ireland; those are business and finance, engineering, IT, healthcare, hospitality, and natural and social science professionals. The current job market offers many options in beverages and brewing, chemicals, computer hardware and software, food products, and medical devices and pharmaceuticals.

Healthcare in Ireland along with education is free. The government pays for all of it and college is also free. Although healthcare may be reduced instead of free. Electricity is available and affordable at roughly $2275.14 (2120 euros) a year.

Cell phones are widely available but landline phones are still used in rural areas because the internet is not always accessible. There are numerous roads even if most of them are dirt. There is public transportation such as Irish Rail and Bus Èireann's network but bicycles are mostly ridden. There are many local markets for people to shop, get food and other items like household goods and clothes. There are local markets in most cities and towns where small farmers and food producers can connect with their customers and sell their wares. All of these things make for a great picture and seemingly good place to live but water is fastly becoming a major issue. Clean water is available as well as all the amenities needed to live a healthy life. But, the water is not always filtered properly and can carry certain waterborne diseases such as E. Coli and Legionnaires disease.

While the tap water in Ireland is filtered and mostly safe to drink the water they use for crop production and animals is unfiltered, which in most cases is fine, however Ireland’s surrounding water is becoming saltier and unsafe to use. When used the crops die and in some cases the animals as well. Over half of the rivers in Ireland are in satisfactory ecological health, being either good or high status. The other half are in moderate or poor ecological status; there has also been a 1% decline in the number of monitored river bodies in satisfactory condition.

The water quality is affecting the urban and rural areas. Most of the farms in the more rural areas use water from the nearby lakes, rivers and even the ocean if they are close enough. Farmers are relying heavily on groundwater, wells and springs to water livestock and grow crops. The water is pumped in via underground piping, canals, and rainwater holding tanks. This water is not always safe for the livestock or the crops as it contains higher levels of salt. In some instances the high salt volume is killing crops and livestock. This is also affecting rural farmers in their homes as they are not able to have whole water filtration systems installed. It has affected some of the basic necessities that they have come to depend on. It has led to more deep water wells being dug but, without filtration the water isn’t able to be drunk as it contains bacteria harmful to humans.

The environment is suffering because of the water quality. Because the quality is decreasing so is the production of crops and livestock that Ireland exports.

The first solution is a hydroponics system. Hydroponics is the process of growing crops in a water based system, no soil is required. A reverse osmosis filtration system can be installed and it is easily accessible to change and maintain. A filtration system isn't necessarily needed, Charleston, South Carolina, is home to the first indoor saltwater hydroponics system. If you don't do a saltwater hydroponics system, you can do reverse osmosis, which is a water purification system that uses semi-permeable membrane with a synthetic lining, to filter out the unwanted molecules, along with large particles like contaminants and sediments such as chlorine, salt, and dirt from water.

The salt water hydroponics system in Charleston is the first of its kind. They are growing salicornia europaea which are edible sea beans that grow in the marshes of South Carolina. The micronutrients in the salt water are getting put into the beans and ultimately in our bodies. Using a salt water system to grow marsh samphire (also called sea beans) to export could help some of the farmers who have been affected by the water. This could potentially open up new avenues of growth for a new major export.

A reverse osmosis hydroponics system would be the best solution as farmers could produce several types of crops that were not already being grown on a large scale. Farmers could grow gourmet lettuces, tomatoes, certain types of beans, squash and melons. The Irish Government could have an incentive program for farmers that wanted to transition from traditional crop agriculture to hydroponics.

The pros of hydroponics are, it maximizes spaces, conserves water, produces higher yields, requires less labor, needs no soil, produces higher quality food, and filter's water. Some of the cons of a hydroponics system are, they are expensive to set up, vulnerable to power outages, they require constant monitoring and maintenance, there can be waterborne diseases, and problems that can affect the plants quicker.

The second solution is a marine aquaponics system. This is an aquaculture system that uses plant cultivation and fish rearing. It has many similarities to standard aquaponics systems except it uses salt water in place of freshwater and in some cases can use diluted salt water. An aquaponics system can also use a reverse osmosis system.

Marine aquaponic systems can have costly set-ups from electricity, to fish tanks and piping. A large scale system can range from 58,000 to 1.22 millions dollars (53934-1115880 euros). While the system is costly, farmers are using one sixth of the water used in traditional crop agriculture while producing eight times the amount of food. A marine aquaponics could help ease the burden of rural Irish farmers who are consistently losing crops because the groundwater is not able to be used to irrigate their crops.

Large scale marine aquaponics systems could potentially provide another export for the Irish. Cod or pollock could be grown in the system and harvested just as all the crops would be harvested. Rice and barley can be cultivated in a marine system. This would reduce the need to plant as many ground crops that can not be properly irrigated because of the water crisis.

These two solutions could meet the needs of the whole population because hydroponics and marine aquaponics are controlled environments that allow for year round crop growing. Individual farmers could maintain optimal growing conditions and temperatures year round for crops. As with any potentially

government funded project there would need to be rules and policies in place such as regular checking and rotation of systems and that all facilities such as green houses were being maintained properly.

The plan of action would be to get the Irish government on board to create a way to incentivize individual farmers with things like low cost loans, a percentage of extra money given back to the farmer at each harvest for the first five years. The Irish government could also work with community programs like Community Gardens Ireland to get one of these systems in place in the more urban areas.

While there is a water crisis in Ireland leading to water scarcity there are solutions that can be used to combat the growing problem. While the solutions are not traditional they can be utilized in a way to help individual farmers fight the growing problem of crop failure. Continued crop failure could be catastrophic to Ireland and potentially cause another food crisis much like the one that happened in the 1990's. By utilizing any of the solutions listed a food crisis could potentially be avoided and there would be a use for the groundwater that is contaminated to grow crops.

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