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Croatia, Factor 2: Water Scarcity

### **Croatia and Water Scarcity**

While searching for a food security issue to make the focus of my 2014 World Food Prize paper, I was surprised to find there are many issues in countries that I believed were stable. Being a naive teenage girl from the United States of America, I often forget the evils that are present beyond my “small world.” All across the globe, humans go to bed starving every night, uncertain about the source of their next meal. People often struggle to find semi-clean water, while I turn down filtered water for an energy drink. My family goes to the grocery store and spends \$200 on groceries that will last a week, while somewhere in the world, people are lucky to have enough spare change for a piece of fruit or vegetable from the local market. I drive past dozens of corn and soybean fields on my way to school each day, not even regarding how lucky I am to live somewhere that can produce our own agriculture. We have such elite scientists and technology, that in Iowa, our corn and soybeans are literally created to withstand any factor they may have to face. We worry so much about materialistic things we lack in our lives, like the newest iPhone, a new pair of True Religion Jeans, or a Michael Kors purse, we don’t take the time to realize how fortunate we are. My family, and the previous two generations, have never faced the issue of struggling to put food on the table for our families. Compared to the rest of the world, that is quite amazing, and a true blessing! In some areas of the United States of America, there are food security issues, but they are incomparable to the problems other countries face daily.

I have chosen to research and develop a solution for a food problem in Croatia. Croatia is not a third world country and they have few food security issues. However, they do have some issues that could be detrimental to their agricultural supply. Croatia is located in Southern Europe in a dry and arid climate where they experience devastating droughts approximately every three years. The decade of 1981-1991 was considered the longest drought period. Severe droughts also occurred in 1992, 1995, and 1998. 2000 and 2003 experienced such horrific droughts that they were proclaimed natural disasters (Advameg). Each time a drought occurs, much of the agriculture that was planted for the season is destroyed. This hurts the farmer, the consumers, and the economy of Croatia. Agriculture is considered Croatia’s most important industry, and each time a drought occurs, it leaves its mark by thousands hungry and the economy in the midsts of recession. It is crucial we establish a way to minimize water scarcity. Croatia would benefit from an irrigation system to help them with the issue of drought.

The average-sized family in Croatia consists of 3.1 people, many of which are single-parent headed. Multigenerational households are also very common due to the harsh economic conditions. 97% of Croatians are covered by health care, but 12% of these people say hospitals and ambulance care are too distant to reach them if needed anyway. shocking only 47.1% of the population has obtained a secondary education. 11.9% of those people went on to complete post-secondary education. Currently in Croatia, 10.9% of the population is unemployed. Among those who are employed, the average household income is 300 kuna (Croatian currency) per month (Advameg). 300 kuna is converted into U.S. dollars at only \$53.58. Could you imagine providing for your family with only \$53.58 a month? Croats diets are

composed of many vegetables, because it is common to have your own garden. Fruits, meats, pastas, breads, and fish are also among popular food items in Croatia. Food access is fairly easy for most Croatians (European Commission). Local markets can be found in nearly any urban city, and due to Croatia's coastal location, fishing for your food supply is also easy, and even better, it's free. If you live in a rural area, it will require extra traveling to reach food. Croatia is only self-sufficient in producing a few products: potatoes, meat, eggs, corn, wine, sugar, and wheat due to climate issues. Large grounds of farmland are very rare, and most farms are widespread. Widespread farms are a benefit for food distribution and making sure food can make it more places throughout the country (Advameg).

As introduced in the first paragraph, Croatia's major food security issue is water scarcity. This primarily affects Croatia's people when they experience devastating droughts. When a drought occurs it usually affects much of the only 21,829 sq mile country. Just to put into perspective the size of Croatia, Iowa is 56,272 sq miles (Advameg). That is almost triple the size of Croatia. We know from living in Iowa, when a snowstorm or record high temperatures are present, they usually affect the majority of the state. When a drought occurs in Croatia, unfortunately, the whole country experiences the drought's "sting." This inhibits farmers from salvaging even a select amount of their agriculture that was planted unless it is approaching harvest time. Living in the United States of America, we often take advantage of our freedom of filtered water use. Of course, we will be responsible for paying the bill to have the water supplied to us, but we are almost always assured if we pay our bill, we can have filtered water of any quantities we desire. Croatia has enough water to be supplied for drinking, but due to some hazards in the water supply, they must go through an extensive process to make sure it is adequate to consume (Centre). With that being said, they do not like to treat more water than is truly necessary for the citizens. It would be hard for farmers to get a large enough supply of water to save their crops from drought, and it would be extremely costly. This gives farmers no option but to let their crops dry out, leaving consumers hungry, and leaving their own families to suffer.

Due to the issue of water scarcity in the hot and arid climate, Croatia's food supply drops drastically in the times of drought. Not only is there the issue of crops not receiving ample water, but wildfires are also a concern. From 1992-2004, approximately 16,200 hectares of land was destroyed by fire, almost half of which was planted with agriculture. Due to the drought of 2003, so much agriculture was destroyed that they were forced to spend \$330,000 to have foods they can usually harvest, imported to them (Centre). This took from the economy, and families suffered even more in hard economic times. Food prices were raised because they had been imported, and of course farm families felt the effects even greater in their losses. Although a serious drought hasn't occurred since the drought of 2003, Croatian families realize drought is always a potential obstacle they may have to face. Farmers prepare for the possibility of drought by the amount of crops they plant and their access to water. Citizens of Croatia have prepared by finding alternative ways to find food for their families. After losing 788 people to the extreme temperatures and malnutrition in 2003, the citizens have gone to extensive measures to make sure they would not be part of such a large number of casualties in the future (United Nations). Poor families, both urban and rural, are at a very high disadvantage when temperatures are extreme and water is scarce. With a lack of income, they are not able to obtain sufficient amounts of water, or find cheap enough food to be well-nourished. They are also forced to travel farther distances to reach food, which is very hard with low funds in extreme weather.

Croatia has experienced drought and extreme temperatures first-hand in the last decade. Although they are not as superstitious of droughts now as they were in the years immediately following 2003, Croatians know with the arid climate there is always a possibility they will occur. This leaves them better prepared, and many have plans implemented for when they occur again. Therefore the trend is improving for some, but only staying constant for others. There were 5,000 people affected between 2000-2003, and I would like to make sure these people have better resources that could now help them through the natural disaster. If the issue of water scarcity was to be improved or abolished, we would see improvement in Croatia's economy, agriculture production, and the diets of their citizens. Farmers would not lose as many crops or as much money, which would allow them to plant increased amounts in the following years, the heat would be beatable, and food prices would be lower due to the high production of food, helping out poverty-stricken families in affording adequate nutrition. While current generations have experienced the effects from water scarcity, I am hopeful they will create new measures to ensure they will not be affected in the future. These preventive steps will help combat effects of harsh weather and help maintain proper living conditions. I hope they also educate future generations of the hazards of drought and the importance of being prepared for whatever may happen. While money and resources will always be an issue, this is a huge step in eliminating the amount of people who face problems due to the heat and water scarcity, and even people who lose their lives from these kinds of struggles. It will also, slowly but surely, help turn around economic problems for the young country (United Nations).

One way to prevent drought as a future problem in Croatia is to develop an irrigation system that can be placed below prospering agriculture. With this irrigation system, I would like to develop a process that would allow us to use water from the Adriatic Sea and remove the salt. If salt water were to be put on plants, it would actually pull the water out of them causing the plants to become dehydrated (Demand Media). Salt water also inhibits plant growth and their photosynthetic capabilities. The process of removing salt from seawater is known as desalination. Desalination's high costs have turned many interested people away (Nature America). However, after an initial investment, costs can be kept minimal. Implementing this by 2015 will require much hard work within the next year. In the long run, it would be hugely beneficial in steering the economy into the best position it has ever seen. Another advantage of using the desalination system is that desalinated water yields higher crop productivity, and requires 25% less irrigation and fertilization than water that isn't treated with desalination (Science Daily). I call upon the government to help farmers with funding for this system, local engineers and scientists to offer their skills in developing the processes, and well-off farmers to take initiative in experimenting with the irrigational system, and offering help to less fortunate farmers. They would need a facility to house the supply of desalinated water. This facility could hire many people to treat the water and install irrigation systems, lowering the very high unemployment rate that currently possesses their country. Adding more job opportunities to Croatia will be huge for their economic situation and helping families. It will be a great opportunity for college students in the United States with science backgrounds looking to study abroad. With everyone's determination and willingness, this project will be a huge success that might even intrigue farmers across the globe to follow in Croatia's footsteps.

I chose Croatia as the country to develop a food solution for because it really hits close to home for me. I am of Croatian descent on my maternal side. We still practice Croat traditions at Christmas time by making Povitica Bread and devouring Sarma on cold nights. I would go to the library when I was in elementary school and check out a book titled "*Croatia*" nearly once a month, and I would read it in full

every time. I am intrigued to learn about my ancestors. I constantly say to my grandpa, “Hey, Papa! Can you teach me any new words in Croatian?”, and yes, I have learned an array of them. I think we should all know where we came from and practice traditions of our homeland. I will visit Croatia someday, but I know not all places of the country are in a visitable state. I hope my irrigational systems and engineering a plan to remove salt from the water of the Adriatic Sea helps my fellow Croat’s live their lives with ease, and it gives tourists like me assurance about visiting the somewhat-struggling place. I believe the economy of Croatia will highly benefit from my idea. Along with helping their own citizens, they will also be able to export more if their agriculture productivity is high. More exporting will mean more money coming back to their economy, resulting in a thriving country. I hope Croatia would be interested in my idea to submerge the food security issue of water scarcity. I am excited to see if they are interested in taking my idea to the next level. I would be overjoyed to travel to Croatia myself and help them work out any kinks for this process. If people of all trades worked together to make this happen, I believe it could be a huge success.

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