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Martinique: Cleaning the Waters for the Future

Martinique is a beautiful territory in the Caribbean Sea. It is a department of France like many of the islands surrounding it. With its tropical climate near the equator, Martinique is a popular travel destination. Known as the Island of the Flowers, hundreds of thousands of tourists flock to the island each year to enjoy its many scenic settings. From beaches to volcanoes to waterfalls, Martinique is considered a perfect getaway, despite the fact that some of the water there is very deadly. Much of the water supply in Martinique has been contaminated over the last century with the overuse of a toxic fertilizer called Chlordecone. Although it has not been used in decades, the effects of this fertilizer are still prevalent on the island and have lasting effects that harm the environment and the people there. This problem has been identified but not acted on in a diligent enough manner. More needs to be done to protect the water supply in Martinique. Water sanitation is a vast problem that affects the daily lives of all those who do not have access to safe and healthy drinking water. Through new cleaning efforts, the department of Martinique can quickly and efficiently have safer water and environment.

In 1493, Martinique was discovered by Europe when Christopher Columbus spotted the island. Already inhabited by Carib Indians the Spanish ignored the island until 1635 when Pierre Bélain established a French settlement called Fort-Saint-Pierre. The colony began to prosper as new crops began to be introduced to the island. By 1660 sugarcane, cacao, and cotton were all being grown. The possession of the island switched back and forth between the West Indies company and the crown until in 1674 when it officially became part of the French Monarchy. After this, the island began using slave labor for growing crops on plantations. When coffee was introduced, the economy grew immensely. For the next 100 years England and France would fight over who owned the island, it wasn't until 1814 when it was once again officially given to France. Many slave uprisings finally brought an abolition to slavery in 1848 and in 1870 the island was given representation in the French Parliament. Martinique continued to push for more power in government and became an official department in 1946 and a region in 1974. However, after this there was unrest on the island about full autonomy. The push for autonomy increased as the decades went by and it now currently has its own assembly, however, it is still under French rule.

Martinique's capital is Fort-de-France which is located on the west side of the Island. Martinique is a part of a volcanic island arc along with the other lesser Antilles islands which include Guadeloupe, Barbados, St. Lucia, and more. The volcanic islands are caused by the two tectonic plates colliding and pushing one under. Martinique's main volcano is Mt. Peele which had a huge eruption in 1902 that tragically killed 15% of the island population. Martinique has a very warm and wet climate. Average temperatures are always around 80 degrees Fahrenheit with north trade winds blowing most of the year. The department faces the risk of hurricanes most of the year which can be devastating to crops and infrastructure. The island's economy is based mostly on agriculture and tourism and heavily relies on France for resources to stay functioning. The current population is about 376,000 people with 25% of that living in the capital of Fort-de-France. About 90% of the population lives in urban areas in one of the few major cities. Despite most of the population living in cities, about 35% of the land is used for agriculture. Tropical crops like bananas, pineapples, and more are grown in much of the northern region of the island. Most farms are small with the average being about 5 hectares in size, which is about 12 acres of land. The major exports are the bananas and sugarcane grown on the farms as well as rum from major distilleries around the island.

Family types in Martinique can vary greatly. They can consist of one, two, or three generations with both nuclear and non-nuclear households. Homes in Martinique are also a wide range based on the time period they were constructed. Martinique families have a mix of French and Creole cuisine that makes the diet diverse on the island. According to LangMedia, "French cooking is known for many variations of herbs and seasonings, along with an array of rich sauces, pastry and meat. Creole cooking is known for a predominance of white rice, red beans, and many varieties of seafood seasoned with tomatoes, hot peppers, and many exotic regional spices" (LangMedia). Families prepare their meals with ingredients that are easily accessible and usually fall under one of these categories. Many people in Martinique work in the service industry and about 1 in 4 people are unemployed. The average yearly income for a worker in Martinique is 39,000 Euros. Education is free and required for all children from the ages of 6 to 16.

Martinique is doing quite well for itself besides a very pressing issue with the access to clean water. The climate in Martinique is separated into wet and dry seasons. During the dry season, it is much more difficult to access clean drinking water because water levels are low. Similarly with an economy relying on agriculture and the production of sugarcane and bananas, it is essential that there is enough water to grow these crops. However, there is not. Between 1972 and 1993 a strong insecticide called Chlordecone was used to kill banana root borers which are about one centimeter in size and can destroy all types of banana crops. These crops are essential to the economy, so the Boers needed to be removed. Chlordecone, a synthetic compound (that doesn't occur naturally), was created and patented in 1952. It was used 1-3 times a year by farmers. They would apply the insecticide to the root of the plant, and it would protect the plants from the Boers. In total around 300 tons, or about 600,000 pounds, of chlordecone were applied over the span of its 20-year use.

At the time it was not known the lasting effects this insecticide would have on water sanitation and the environment. Since Martinique is a volcanic island, much of the soil is made of volcanic ash and pyroclastic deposits (a type of volcanic rock) from lava flows. This soil type has a high concentration of carbon which allows pesticides, like chlordecone to be absorbed. This creates lasting effects many years later. This is very harmful to humans and wildlife. When this compound stays in the soil it can runoff and contaminate water sources all over the island. The effects and widespread use of this chemical are embedded throughout the island.

Human health is a major concern with this chemical because it is considered a "carcinogenic compound with reproductive and developmental toxicity and is characterized as an endocrine-disruptive chemical" (Bio contact). This means that it is a very harmful chemical to have in your body. Studies have found that chlordecone can cause major problems with pregnancies. Babies can be born prematurely, have problems with cognitive and motor skills, and can be underweight when mothers are exposed to the chemical. One study even found that with "Toxicological studies on animal models and epidemiological studies have

shown adverse effects on the nervous system, reproduction, the hormonal system and the functioning of certain organs (liver, kidney, heart, etc.)" (Anses). With so many risks associated with being exposed to the pollutant, many people are forced to find new water and land sources. This limits the amount of available clean water and soil. Farmers who cannot relocate are faced with concerning health risks. Chlordecone expose increases their chances of getting cancer, they may face nervous system damage, skin damage and even liver damage. All because this pesticide was used on the land. It has contaminated everything from rivers and farms to aquatic marine environments. The individual people living and working in Martinique need to be protected from these risks. Not only affecting humans but plants and animals as well. Chlordecone can even be found in some plant and animal products that were near old, contaminated banana plantations. The widespread effects are all over the island. Local foods are among the things most affected, this means that local families are in danger as well. As many as 90% of individuals in the general population have been affected. Those that are most affected are those living in areas that were once banana plantations and are contaminated, individuals who consume a lot of fresh water and seafood products from their own fishing, those who eat a lot of animal products, and those who consume a lot of vegetables from their own family gardens. This problem is so widespread and impactful on people and the environment that something needs to be done immediately. This problem cannot last any longer and action must be taken soon to help the people and land affected.

Firstly, not enough is known about the toxicology of Chlordecone. This is an enormous problem because it can be present in the environment for up to 700 years. The first thing that needs to happen is a largescale research project funded by the French government. This project will determine all of the lasting effects this can have on those already affected and how best to delay those effects. This project will also dive deeper into the paths that the chemical took throughout the island to determine the spots that are most widely affected. A team of environmental scientists, chemists, and toxicologists needs to be employed to get as much information about this chemical and how it is affecting the islands. Currently, the toxicology of Chlordecone is somewhat unknown and with that it is unknown the full range of its problems. It is currently known that the effects of long-term exposure are lasting and can accelerate other problems like cancer and developmental disorders. Research targeting this specific area of causes and effects of the insecticide can further open up what needs to be done to help those already affected. The strengths of this solution are that the French government will look after its departments, those who are already affected will be helped, and most importantly, more information and scientific knowledge will be discovered to eradicate this problem and could be used for similar problems around the world. Some weaknesses to this plan are that it could take a lot of time and money. However, it is an important enough topic that has been prevalent for a long time and is matter of life or death.

Secondly, there needs to be a widespread clean-up of the soil and water sources of this pollutant. It is prevalent in many aspects of the island, and the effects can last for hundreds of years. The solution to this is a widespread cleanup and insulation of more water treatment facilities on the island. Much of the environment has been negatively affected by the chemical and soil and water treatment plans need to be implemented to stop the problem from continuing. The French government will help fund the cleanup of Chlordecone using resources that they discover are most useful in the research inquiry on the problem. The strengths of this are that it will finally help Martinique to fully recover from the effects of the fertilizer and it will help those who struggle to have access to clean water. The environment and wildlife will also be protected from harm. However, the weakness of this is that it will cost large amounts of time

and money. Another weakness could be that there is little support from the people of France. This could be a barrier to getting the solutions that are needed. This can potentially be overcome if the findings from research about the toxicology are published about the harm and problems caused by Chlordecone. Since many people in France vacation in Martinique they wouldn't want the water to be unsafe. If this perspective was broadcast many would support the use of resources for cleaning the water. Also, there needs to be a concrete plan so that it does not fall apart and get forgotten about. This is why there will need to be widespread support from the people of Martinique and France so that their department will be cleaned. Individual citizens need to show their support for the cleanup of the environment so that officials stick to their word and carry out the plans. Ordinary people need to hold the government accountable for the unsafe waters and take the necessary action to fix it. Likewise local and international organizations can help spread awareness of the problem and get citizens involved in the progress of cleaning the waters and soils of Martinique.

Both solutions need to be implemented together for the best results. To truly solve the problem of the Chlordecone pollution the French government must be committed, and the people of Martinique must ensure that the government gets involved and acts. If the solutions are fully implemented, then the water sanitation problem can be solved and those living and visiting the island will be much safer. Chlordecone will be a problem of the past and the island can prosper.

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