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### **Philippines: Creating Safer Water Sources in the Philippines**

Have you ever taken the time out of your day to acknowledge that you have loved ones, food, and a roof over your head? If you have, you know how lucky you are. You are a thankful person. How often do you say thanks for the fact that you have access to clean water? Something as simple as water is causing a world of chaos in many countries. The Philippines, located in Southeast Asia, have been struggling with access to clean water for years. Bordered by the Pacific Ocean, they have two major monsoons annually, which are responsible for the tropical marine climate. As a result of this climate, they experience cyclones, landslides, active volcanoes, earthquakes, and tsunamis. Although they face many problems on a regular basis, the Philippines are a strong nation which has overcome many adversities. A relatively small nation, with approximately 98,000,000 people, is mostly made up of people between the ages of 1 and 64. In comparison to the rest of the world, it is ranked 72<sup>nd</sup> in population and is about the size of Arizona. The families are rich with tradition, usually containing around 4-7 people. The roles in the family are similar in every household. The men usually provide the money and the women do the house work. The children help with whatever they are able to do. When the children become old enough, they accept responsibilities and help provide for their family. The majority of the Filipinos are Catholic, with around 90% Christians. The natives have developed many different forms of entertainment, ranging from performing arts, to cinema, and television. Many refer to the Philippines as the melting pot of Asia. Their cuisine ranges from rice to corn, and even roasted pig. Like America, they have a wide variety of cultures so they utilize many different traditions. On paper, the government is set up like the United States. It is a republic containing an executive, judicial, and legislative branch. Unlike the United States, the government's involvement is very slim. The efforts to improve problems are very small and are hurting the country significantly.

In the Philippines, there are two types of families. The majority of the families lives in rural areas and maintains rice farms. The average family contains six people who live in one small house made of bamboo and palm thatch. Most live on land that is leased so they pay a monthly bill for electricity and drinking water. For a living, they weed the landowners place and in return, are given around one eighth of the crops. During harvest time, everyone in the family works and earns their share of the income. On average, 65% of the family's income comes from the harvest. The sad thing is, the average family brings in around the equivalent of 4,000 US dollars. On top of harvesting, the family usually keeps one pig and a few ducks. They take care of them and fatten them up for extra money. When the pig is fattened, it is taken to the market and sold. Usually, 20% of the family's income comes from the pig. Unfortunately, the vast majority of these families are in serious debt due to low, inconsistent income. Most families are torn between two decisions. If they have many children, they will be able to use them for work. But, if they have many children, they have a greater risk of going into poverty. On the other hand, a family who has very few children has much lower expenses. But, they don't receive the same amount of income. The literacy rate in the Philippines is around 92%. This shows that Filipinos have a thirst for knowledge. Unfortunately, sometimes the schooling stops after learning to read and write. Only around 60% of the children are becoming adequately educated. This is leading people into unfavorable lifestyles causing a very large mess. Almost every rural family faces this problem and on top of those problems, lays one within their water.

With a land mass of 74,131,614 acres, water makes up half of the country's area. By having such an abundance of water, it becomes very vulnerable. The Philippines are a nation on the rise with much

involvement in industry, agriculture, and a growing population making their water and untreated garbage disposal a very large problem. Because they abuse their water it becomes highly contaminated with diseases and infections. Many Filipinos think dumping in the water might be easy at the time, but they aren't looking at the larger scale of things. The average Filipino farmer uses a large amount of water for their livestock and crops. If they consistently use contaminated water, their products become contaminated as well. As a result, it becomes harder to sell their products and they make a significantly less amount of money. On the other end of the spectrum, the buyers are affected just as much. Urban families are used to going to the town market to buy quality goods at a fair price. When farmers use tainted water to clean and irrigate, their products are diminished as well but they still have to take them to the market. After a while, people start to realize that the quality of the products is decreasing so they either find another place to buy goods or just stop buying them period. This causes two major problems. The first is that both the buyer and seller are at a disadvantage. The buyer has to start paying more for a diminished good. And the seller has to start charging less which ends up costing him money. The second is that the majority of the people in the area use the same water source so it is extremely hard for a family to find pure goods. Some families have to start eating different diets which can quickly lead to malnutrition. Most turn to rice as their main dishes. It is very abundant in this Asian nation but it is very vulnerable to becoming contaminated. Just like the water, if rice is not taken care of it gets bad. Although these problems may seem small, they escalate over time and have started to cause serious problems for the natives.

At this time, bacterial diarrhea, hepatitis a, and typhoid fever are the major illnesses caused by water contamination. Also, leptospirosis, a very severe and contagious disease caused by contact with bad water, is affecting many Filipinos. Unfortunately, the number of water related health outbreaks is going up and there isn't much going on to stop it. The environment is slowly becoming more hostile due to all of the water borne diseases. In most countries with a major problem, it usually just targets the rural or the urban population. In the Philippines, this tragedy is affecting both those who farm and those who don't. The main way of getting food in the Philippines is by either growing it yourself or buying it from a local market. With water contamination as a problem, everyone is influenced in their own way. Unfortunately for the Philippines, the problem looks easily fixable from the outside when really, there are many influences causing the problem to expand. The main factor is getting adequate government help. The government provides little assistance but not much because the problem has not gotten any better for the longest time. The reason the government has had very little involvement can be condensed into one word, money. It would take a sufficient amount of money to solve these problems with their water but the heads of the government don't have the desire to.

With about 85,000 manufacturing industries in the Philippines, waste placement has become a major dilemma. Among these industries are electronics assembly, garments, footwear, pharmaceuticals, chemicals, wood products, food processing, petroleum refining, and fishing. These industries pollute water differently. The most common ones are radioactive substances, petroleum, and heat. Radioactive byproducts are very common in nuclear power plants and pharmaceutical industries. These byproducts find ways to escape the plant and contaminate the water. Having multiple refineries, the waters are often subjected to large amounts of petroleum as well. It is said that about one ton of oil is spilled for every million tons that are transported. Over time, this oil has built up and turned into another source of pollution. The last source, heat, has been around forever but has never been able to be stopped. In an area like the Philippines, the temperature is consistently hot. In turn, this increases the temperature of the waters and creates a not-so-ideal place to live for the sea creatures. As a result, they die and create more pollutants in the water systems.

As stated earlier, they are capable of cleaning their water but the problem lies with the people. The problem with fixing the water is simple. The people who have the power to fix the water have never

really had a problem with it in the first place. As a result, they see no need to change their waste disposing habits. This unfortunate obstacle is causing the problem to worsen. Only a mere third of the river systems are classified as a safe source of water. As in any country, the rich get the best, and the others get the rest. This sums up the Philippines water in a nutshell. It is clear that the wealthy get the good water and those who aren't considered important are left with the tainted water. Statistics show that 58% of water sampled from the ground is contaminated and needs treated before using. This makes it extremely hard for rural farmers who have their own source of water to not contaminate their crops. When your crops are tainted, it is very easy to harm the person who is consuming them. Studies have shown that about one in every three illnesses have been caused by water-borne diseases. With the statistics working against them, the farmers are left with a tough decision. Either use the water and risk contamination, or not use it at all and suffer having no water. The government has made some effort to help fix the problem but the result is very small. They have started pollution fines and issued an environmental tax. Although these potential solutions may seem like they would work, they aren't doing much.

If the people of the Philippines would pull together, they could accomplish great things. By becoming more conscious about the water crisis, Filipinos could eliminate the problem completely. If the people who had the power stopped polluting the water it would be beneficial to the whole country. To do such a task, though very difficult, it is possible. The empowered people need to be educated to take part in a seminar or a class about the problems being faced by the average Filipino. This would help create empathy and would make them more aware. If properly informed, they could start small and then make a big difference. Taking care of the unsanitary water would start a chain of good events, starting on the farms. When the farmers have a sufficient amount of clean water, their crops turn out well. If their crops turn out well, that eliminates many food and water borne diseases. Also if the food is good, it means more income for the farmer. It's very simple, the better your crops are, the more money you will make. On the urban populations' end, when the farmer sells more food, the prices go down. This also gets rid of malnutrition. Not only are the families getting their food at a reasonable price, the quality of it would be superior as well. This great chain of events helps everyone achieve a better life. Not only does it help the farmers and those who live in cities, but it also helps those who live in poverty. With unsafe water, many families were forced into poverty because of high food prices they couldn't afford. Another unfortunate way to go into poverty is by contracting an illness from the food and not having the money to buy medicine. By making water contaminating a relevant subject, it helps the economy by reducing the number of those in poverty. As a whole, everyone living in the Philippines would benefit from clean water.

Although the Philippines may seem prosperous, they are classified as a third world country. The country faces many different issues ranging from politics to poverty. Most of their issues are able to be controlled by them. One that is generally uncontrollable is the climate. In the islands, they usually experience two different extremes of climates. In the summer, the monsoon brings heavy rain. This causes the majority of farmers' problems with flooding of the crops. On the other hand, the winter monsoon is dry leaving the farmers with water shortages. Some residents have made efforts to try and help the scarcity of water by innovating houses and other devices used to collect rain water. The main promotion has been using something as simple as a bucket or a barrel to collect the rain water. Unfortunately, these great ideas are not popular whatsoever. As previously stated, the Philippines have some government aid, but it is extremely limited. Those who are working toward resolving the problem have never experienced it firsthand. As a result, they have very little desire to work on, or even touch on the problem. The wellbeing of each family would significantly rise if they could learn to harvest rainwater.

Another major issue faced in the Philippines is rapid population increase. With a growing amount of people they need to become more efficient with their products, specifically food and water. If the

children that are being born aren't properly fed and hydrated, it can lead to serious malnutrition. Most countries have this same basic problem but the Philippines have an easier resolution. The Filipinos have a sufficient amount of water; they just need to learn to take better care of it. In a sense, they are very blessed and lucky to have the resources in the first place as opposed to not having them at all. One thing the nation must start doing is educating their youth better. Only about 60% of children are educated in the Philippines. This number is not unusually low in comparison to the rest of the world but there could still be some changes made. One of the things they could start teaching is the importance of agriculture. Stressing the importance of clean water and doing all you can to make sure it is pure would make an enormous difference. Everyone always says kids are the future of the world, so why not educate them?

As faced by every country, urbanization is becoming more and more relevant. It is projected that about 72% of the population in the Philippines will live in urban areas by the year 2020. Although this number may seem normal, it has taken a very large leap from the previous 56%. This brings up make controversies regarding their water sources. What will they do for clean water? What will they do if they can't find adequate, reasonably priced food? Both of these issues can both be eliminated by getting the Filipinos a clean, reliable source of water. In the United States, urbanization is on the rise. It is not looked at as a problem though, because we have adequate resources. If the Philippines could get proper water and food to their families in the cities, this problem would be eliminated.

Over the years, the Philippines' industry has grown to play a large role in their country. With this industry comes multiple byproducts and waste. Although these industries are seeing positive results, their oceans and rivers are being severely affected. The big companies are failing to realize the damage they're doing to others by not taking care of their waste. Although the industries are neither growing nor declining much, the problem has potential to be huge. The CEO's of the big companies tend to overlook the problems because they have not experienced it firsthand. They also think that the problem is fixing itself, since the industry is hardly growing. The sad thing is, there isn't much the farmers can do about it. The only logical thing to do would be to pull together and protest, but it would be immediately shut down. All of these problems contribute to the large picture of having clean water in the Philippines.

The first step to solving this problem is simple. You must educate the people. This doesn't mean they need to be sent back to school, but the public needs to be informed. The government has made a small attempt to do so, but it has not helped. Every public bathroom you walk into, in the United States, you see signs about preventing diseases from spreading. This knowledge of illnesses does not exist in the Philippines. Although their problem is much different than ours, it can be solved the same way. In the USA, we spread diseases by not washing our hands. In the Philippines, they spread diseases by using the water. They aren't fortunate enough to have something as simple as a reliable source of clean water. In America, we take little things for granted, but something as little as a piece of paper can make a huge difference in a Filipino's life. With every solution comes another problem, and usually it is money. Many might ask where they would get the money for this. The fact is, putting up something as simple as a sign is very cost friendly. The money could come from numerous places, whether it is fines from people who deliberately contaminate the water, or a small tax increase. To some it may seem pointless and a waste of money, but the truth is, something very little can make a huge difference.

The next big step toward solving their problem is innovation. Once the people are educated and aware, they are able to realize the consequences of using bad water. Over the years, there have been many attempts to solve this water crisis and most have failed. Through much research, I've devised different solutions for the different scenarios that are faced. The first solution is to harvest rain water. If the people had a way to catch and collect the water when it rained, they would find themselves with an abundance of water during the winter monsoon. This solution requires lots of work but would greatly pay off. Large funnels could be used to collect the water and let it flow to a larger source. The main

components would involve funnels, tubes, and a place for a larger source of water. This would allow natives to catch the water and save it until they need it. Although this plan would catch water, it would also catch bacteria. A great way to rid the water of this would be to boil the water using solar energy. If you could set up solar panels to absorb heat and transfer it to the water, the water would become clean. Unfortunately, this solution would require lots of money. Not every home could afford to consistently harvest this rain water. On the bright side, this would be a great new industry. If they could build a plant with large solar panels and funnels, the productivity of clean water would be enormous. Not only would this be a great way to distribute adequate drinking water to the people but it would also create jobs and stimulate the economy.

Another route the Philippines could take towards solving the problem is to start using well water. In the Philippines they utilize the wells they have but they aren't properly informed about them. Even though water may appear to be clean it doesn't mean it really is. Around 30% of all well water used for drinking is infested with nitrate. This may not sound to be much of a problem but 30% of the water is significantly over the safety limit provided by the World Health Organization. This is causing problems for many people who use well water as their main source. There isn't much one can do to affect the quality of their well water. What they can do is be cautious. Many use different types of filters whether it is a make shift one or an advanced filter. Filtering the water is a good cautionary step to take but again, boiling the water is the safest thing to do. Since not many homes are blessed with electricity, boiling the water becomes a very large hassle for them. This is another great reason to implant the use of harnessing solar energy. If the government could get actively involved they could help these people to boil their water and make it safer.

The problems of the Philippines are big, but ultimately, nothing is more powerful than the people. The government in the Philippines is hands off for the most part. From our stand point these problems may seem diminutive but in the Philippines, they are causing death. It is impossible for one to solve this crisis alone the people of the Philippines need help. Communities can pitch in by educating themselves and others so they know what they're working for. They also can start petitions to get the government and other agencies more involved. The World Bank could contribute by loaning the Philippines the money needed to start the innovations. The cost of some projects would be very high but with the help of the World Bank they could make it possible. There are multiple agencies that help with different problems with water. CARE is an organization that helps communities build and maintain clean water systems. They mainly provide the training and the labor but it is the townspeople who usual are responsible for providing money and the labor. Not only would this help get villages a great source for water, it will also educate them. One of CARE's priorities is educating their people to prevent illnesses and promote good hygiene. A program specifically started for the protection of rivers and other large water sources is International Rivers. They would help the Philippines to take better care of their main sources of surface water. It is extremely hard for Filipinos to find clean surface water and an organization like International Rivers would be the perfect fit.

In conclusion, the Philippines have a wide variety of problems, but they also have a wide variety of solutions. Having overcome many problems in the past, they shouldn't stop at the water crisis. To their dismay, they have many factors working against them but if everyone pulls together they can clean their water source once and for all. They must learn to clean the surface water for the sake of irrigation and clean the tap water for drinking and cleaning. The number of people in the Philippines in poverty is high but most believe that if the water crisis became irrelevant, then the number would decrease. The chain of events caused by bad water has always played a large role in the Filipino's life. When farmers use contaminated water to irrigate and clean their crops, the quality decreases. When they take these contaminated crops to the markets to sell, they don't receive as much for them because they aren't a good product. In turn, they must sell them at a lower price which ends up costing them money and forcing

many into poverty. In the cities, they have similar problems. They have to buy what they can get their hands on to help feed themselves and their family. If their goods are tainted, it quickly leads to malnutrition and illnesses. The majority of families in the urban areas can't afford the costs of medicine so they have to either risk death, or go bankrupt paying for a cure. Both classes have been thrown into chaos because of something as simple as water. The country is currently struggling with the same problem they have been for years. Sadly, the people of the Philippines are not receiving much help from the government or any other agencies so the water dilemma has hit a stalemate. The Filipinos are at a major disadvantage because there isn't a whole lot they can do. As in most cases, there are multiple sources for the water problem. The problems have come from multiple industries. Spilled petroleum and excess radiation have found their way into the water sources making them inadequate to drink. As a result of this run-off, the water becomes deceiving. The water may look clean, but it is very bad to drink and use. Solving this problem has been tossed around for ages but no affirmative action has been taken. To overcome the issues, three things must happen. The government must pitch in, the people must pull together, and a few non-government agencies need to step in. If the government would pitch in, they could educate the people about the dangers of water and how to play it safe. Along with the government, the non-government agencies could help jumpstart the project and really get the projects going. Work ethic would not be a problem whatsoever. The people could pitch in knowledge of the land and labor needed for construction. The water issue has many different ways to be solved, the Filipinos and the government just needs to decide what road they will take. Like every road, there are a few bumps, but if the Filipinos can get past them, they can reach their final destination.

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