

 **ASSIGNMENT**

 **(LIFELONG LEARNING)**

**WASTEWATER ENGINEERING**

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INTRODUCTION

 Innovations on environmentally solutions have been currently active taking place globally in any countries. Most countries prefer to have green solutions for their environmental issue. Many new technologies have been developed or currently being developed by companies, researchers, or universities. Nowadays, many country face different environmental issue. There is country that facing water crisis problem and some of it having critical excess of waste material and critical air pollution.

 The example alarming environmental problem that we can see is Philippine. This country has extremely excess garbage in their country where cause illness and disease towards the villagers. There are tons and tons of garbage that is being disposed in just one home. What more for the whole country? The country also faced an extremely flood problem due to the clogging of the waste in the canal for the water flow. Thousands of homes are being swept away by flood which resulted from trash that has been thrown just anywhere. Garbage kills a lot of people if it is mismanaged. Illness and diseases from garbage will not only kill the lives of the people but they will also lose money from it. Diseases such as dengue fever, malaria, cholera have increased throughout the year. Money they can use for other purposes, instead of buying medicine or paying for hospital bills. Waste management is really necessary to be able to resolve and even just to minimize the garbage and other problems of the country.

In conclusion, can each of these countries solve their own problems that involve Mother Nature issue? How will they solve their problem? What kind of innovation or green ideas that they will bring to the world on saving their beloved country from being destroyed due to their own wrongdoing? How are they going to survive?

Philippine Waste Energy

Problem

Philippine is one of the countries that are totally corrupted due to the extremely **excess garbage waste**. The Philippines is looming with garbage problems despite the passage of the Ecological Solid Waste Management Act or the Republic Act (RA) 9003. In 2007, the first quarter data from the National Solid Waste Management Commission shows that there are 677 open dumpsites, 343 controlled dumps, and 21 landfills in the country. An additional 307 dump sites are subject for closure or rehabilitation plans but without definite schedules for reinforcement. About 215 additional landfills are being proposed to be set up nationwide.
 

**Figure 4:**

[Alarming Waste Problem in Philippines](http://imagineechoprojectswaste.blogspot.com/2008/04/alarming-waste-problem-in-philippines.html)

These polluting disposal facilities are major sources of greenhouse gas emissions to the atmosphere which adds to global warming. Landfills and open dumps, according to studies, account for 34 percent of human-related methane emissions to the atmosphere, a global warming gas that has 23 times more heat-trapping power than carbon dioxide. Other than global warming, the release of methane gases likely cause hazard in human health. Most of the villagers in Philippine spent their money to treat the disease like Malaria other than use it as family living costs. So this is the reason that Philippine have low living style. These landfills and open dumps are illegal under RA 9003. After years, many people trying to find a way to overcome this hazard problem without disturbing Mother Nature.

Type of Innovation

There are 3 ways of overcoming this problem from the innovation; Incinerators, decomposition system and bio-gas engine system.First, **incinerators** are one of the procedures for waste management. But this kind of procedure emits more greenhouse effect to the environment. It has significantly higher levels of greenhouse gas emissions than a coal-fired power plant when all of the carbon coming out of an incinerator stacks is measured. Such emissions are banned by the country’s Clean Air Act. So the Philippines ban this kind of waste management process to ensure there is no air pollution problem. Waste management is not just a government responsibility. It should also be done by every individual. Using materials that are environment-friendly, we can help in minimizing and even solving the garbage problems of the Philippines.

 

**Figure 5:**

A series of pipes tap the methane gas that is produced when rubbish decomposes. Collecting the methane and turning it into electricity saves it from rising up into the atmosphere where it acts as a greenhouse gas.

**Decomposing** rubbish produces methane, which is one of the greenhouse gases that scientists blame for global warming and turning it into electricity saves it from rising up into the atmosphere while reducing the need to burn fossil fuels. As we know, methane gas that released from any decomposition can harm the air quality and cause high rate of global warming. It is fact that where the cause of highly corrosion of ozone layer is because of the increase in methane gas composition in atmosphere. So, how did they manage to control the emission of the methane gas towards atmosphere and ensure that the methane gas will run inside the pipes tap? Most of the way that has been used is they are likely sucked the methane gas using pipes tap and collect the gas in one tank that can be use to generate electricity.

The methane is captured with pipes that are dug into the landfill that is similar to wells that extract gas from under the ground or ocean into the fuel input of the **bio-gas engine**. The specially designed bio-gas engine is based on internal combustion technology and converts the chemical energy of methane into mechanical energy. Then, the drive shaft of the engine is connected to the shaft of an alternating current generator that outputs electrical power. The electrical power is used to generate energy that produce electricity in every village at Philippine. This process of generating electricity is conducted by one company at Philippines which is **Pangea Green Energy Philippines**

This technology provides for the safe disposal of waste without excessive harmful emissions to the atmosphere and at the same time it offers maximum benefits from the recovery of the valuable contents of the wastes from our cities. So, this way is suitable to overcome the waste issue in Philippine as the energy released can be converted into electrical energy and beneficial towards the people. From this way, villagers can enjoy using electricity from the production of methane gas from the waste.

 

**Figure 6:**

Teresita Mabignay and her neighbors from Payatas village in Manila, the Philippines, do their ironing with free electricity generated from the methane gas that is emitted from the dumpsite near their homes

“It really helps because it cuts down on our electricity bills. Sometimes we use the savings to buy food,” said Mabignay, 50, whose husband earns the equivalent of about US$200 (RM620) a month working as a security guard at the dumpsite. The company behind the project, **Pangea Green Energy Philippines**, can afford to be generous with its electricity as it is earning hundreds of thousands of dollars to capture and convert the gas.

Other than that, one of the other ways to control the excess garbage is by change the human behavior. Government start to restrict the law that every villagers need to follow. **Recycling** is still the best way since many years. It helps to conserve and preserve environment nature. Government had provides the recycling bin at every place to increase the realization in the recycling matter. More, because of the lower lifestyle among Philippine villagers, some of this way can help them to earn money by recycling their waste other than contribute in the environment cleanliness.

Conclusion

In conclusion, we can see that how the innovation today help in overcome the fatal problem in society. The way they find the solution shows how important an innovation towards the day life. When we achieve a millennium era, there is some country that still left behind that need new discoveries to help them in overcome their problem at which we can see in Philippines. The critical waste problem in that country force people to think creatively in how to find solution to overcome that problem. At first, we can see the step where they try to use incinerators, but then they think of other way which is safe by decomposing the waste. However, the emission of the methane gas is one of the other problems they need to overcome. So, the discovery of converting the methane gas into electricity is one of the ways to help reduce the release of methane gas into atmosphere. This way being done by the use of bio-gas engine that use to convert the gas.

# Last but not least, in my opinion to reduce amount of methane gas as they might be leaking during the suction of gas into the suction pipe, they can use Hydraulic Fracturing Operations is a well stimulation operation in which fluids are pumped through a well to low-permeability formations at sufficiently high pressure to create new fractures in rock or to open existing natural fractures, so that greater volumes of oil or methane gas can be produced. A study has been conducted to reduce environmental and human health consequences of releasing hydraulic fracturing fluids. So, from this problem, we can say that overcome the problem is better than change the nature itself.

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