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Minimizing Environmental Degradation while Using Sustainable Food Practices in the Philippines

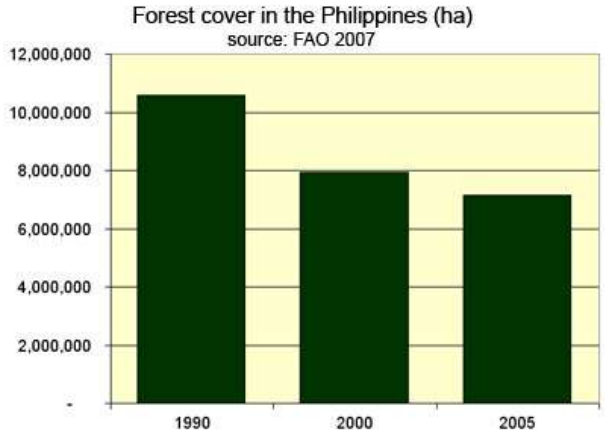
The Philippines is a large archipelago in Southeast Asia. This tropical chain of islands holds a large biodiversity and slightly more than 90 million people (Philippines). The struggle for the coexistence of these two has been a long lasting issue. With a growing population rate of about 1.8 % the Philippines is becoming overcrowded for a country whose land area is just 298,170 sq. km. (Philippines). The Philippines has a population density approximately nine times that of the United States. This has put an added pressure on food production and the amount of area to produce this food. As a result agricultural practices are being used that use a lot of water, energy, and chemicals that pollute and contaminate the land, water, and atmosphere. While these practices have produced enough food, they are only temporary as they continually destroy the environment. These practices over the years have depleted the Philippines natural environment. It is evident in the soil, water, and by the loss of forests. The use of synthetic fertilizers and pesticides have poisoned the soil and nearby streams. This is because the soil has been so over fertilized with unnatural chemicals that it has lost much of its productivity, and the runoff enters the streams. Once the soil loses its ability to provide, more land must be cleared to get to healthier soil. This has had terrible effects on the forests. As of 2008, only 23% of the Philippines was forested, and the deforestation trend continues (Philippines). The side effects of industrial agricultural practices are not only detrimental to the environment and biodiversity, but the foods produced in this way are not as healthy, compared to foods produced by sustainable agricultural practices. All the chemicals being used on the crops are also being ingested by the consumers. These chemicals and nitrates have been linked to cancer, so there are also possible health risks. The environment of the Philippines is vital to its success because the loss of natural resources has been associated with increasing poverty levels. By minimizing environmental degradation associated with industrial agricultural practices this preserves the environment and natural resources, and in return should help drop poverty levels and increase food production. To make progress in food production, the Filipinos need to be able to work with the environment so that it is no longer being harmed.

The Philippines is one of the most populous countries in the world, so family sizes are fairly large. A typical farming family size is around 5 to 6 people. The families consist of a husband, wife and 3 to 4 children. This is a fairly large family to provide for, so a lot of the farming is just subsistence for the family. The Filipino diet is about the same as many Asian countries. The main staple food is rice. This is because rice is fairly cheap and it grows well in the area. Their diets also consist of fruits and vegetables. These are also locally grown. Some examples of the fruits and vegetables they eat are mangos, bananas, coconuts, and leafy vegetables. These are often used in many dishes. They also eat meat. Pork is pretty prevalent and is the most commonly consumed raised livestock. Being an island country, seafood and fish are also a very large part of their diet. Over the years the Philippines have improved their educational system, but there is still room to be desired. The primary school is like basic elementary through middle school in the United States. Then secondary school is more like high school. Most children do attend primary school. The attendance drops though from primary to secondary. Only about 50 % of the children enroll into secondary school after primary school (Education). After an improved educational system it isn't surprising that the literacy rate is now about 96% (Education). The health care program in the Philippines has been improved to reach out to everyone. One issue in the health care area is the loss of many health care workers. Since the 1970's many doctors and nurses have been leaving the Philippines for the United States, where they could get better wages and working conditions.

Family farm sizes are small; only about half a hectare to three hectares, which is about the equivalent of one to seven and a half acres ("Statement"). This explains why the families are not able to produce a lot. Some typical crops grown are rice, corn, bananas, sugar, or coconuts. Many farmers in the uplands use an agricultural practice called shifting cultivation. This practice involves cutting down a few acres of land and then farming it until the soil is drained of its nutrients. Then the infertile soil sits there in a long fallow period, so it will eventually gain back the nutrients naturally. To make up time in the fallow period they use synthetic fertilizers which deteriorate the soil overtime. This kind of agricultural practice leads to numerous major barriers to improving the agricultural productivity. Using the land until it is infertile and then abandoning it leads to poor soil quality and bad soil erosion. There is a lot of erosion and soil degradation because the soil is exposed in open fields. The soil erosion is causing other major problems to the environment. It is entering the streams and polluting them with added sediment. This type of practice is an inefficient use of the land. Shifting cultivation is an outdated way of farming and has very negative effects on the environment. Poor roads to market are another barrier. With underdeveloped roads, it makes it more difficult to access local markets, therefore making it access to food more difficult. Their current agricultural practices play a large role in not allowing Filipino families to produce enough food. With their main agricultural practice being shifting cultivation, this is slowly destroying once usable land. If the soil is not appropriate for farming, then it is very difficult to produce a sustainable food source. If a family isn't able to produce much food, then they are also at a loss of income. This is why it is vital to the people of the Philippines to take good care of their natural resources because if they do not, farmers will be threatened by poverty because they are not able to grow sufficient crops. The farmers' ability to produce goods without having a negative effect on the environment is pretty dismal. Not much is currently being done to help slow down the environmental degradation. The farmers want to stop being so destructive, but they do not have the money to fund alternative farming practices that are less harmful to the environment. The situation is only growing worse as the need to produce more food rises to meet the needs of a growing population. It continues to get worse as more and more land is being destroyed and the soil is becoming infertile and washing away.

The trends are not improving. The government has tried to set up laws against deforestation and preserve what is currently left of the natural environment, but they have been unsuccessful due to poor enforcement. For example, even though there was a logging ban set in place between 1990 and 1999, 750,000 acres of just virgin forests were lost (Bangwaya). People are easily getting around these regulations. Only in the past few years has the rate of deforestation slowed. This bar graph below illustrates the significant loss between 1990 and 1999, and the continued loss until 2005 (Hance).

These trends are measured by forest cover maps and statistical data in percentages. These measurements tell the same story about the current issue. The environment is still being degraded and the soil is



becoming infertile. With the land becoming infertile, it is more difficult on the farmers to grow their crops. They have limited space and once the land becomes infertile it usually has to be replaced by fertile land from forests.

By improving agricultural practices that minimize environmental degradation, the farmers could be able to produce more food, which would result in a higher income. They could do this by learning better and more sustainable agricultural practices which don't degrade the environment. They could also use organic fertilizers which help the crops and soil, without harming the productivity of the soil. A huge benefit towards improving this factor would be that it helps preserve the remaining environment. The Philippines has a very unique biodiversity and much of it is in the forests. For example, slightly more 60% of both plant and mammal species are endemic to the Philippines, which means they are only found in the Philippines (Philippines). By improving the environment, plants and animals living there are kept in their natural habitat. If this is addressed correctly it really could help economically and financially in the Philippines. The only thing that stands in the way is deforestation. With the ability to produce more, the area would have a larger and cheaper food source in their homes and at their local markets. Economic development would improve with an increase of buying and selling of goods. Also with a larger food production, the poverty stricken should have access to a cheaper source of quality food. Since there is high poverty in the farming sector those people would benefit more now because they, too, are able to produce more food for themselves and sell abundance at local markets. Improving this would help put money into the pockets of the smallholder farmers because with the increase of crops, an increase in income should result as well.

There are many other issues that will affect the Philippines in improving their farming and capacity to produce more food. These issues include population growth, climate change, pollution and natural disasters. Perhaps the biggest issue is population growth. The Philippines have had tremendous population growth in the past 50 years. Major climate change could also affect this factor. If there is a major climate change, that could put pressure on the crops. If the crops couldn't survive, then there would be a huge loss of food and money on the farmers, and those who depend on the farmers. They could have to find crops that would be able to survive in the post climate change. This could be both very costly and a process that would take awhile before the first harvest. High levels of pollution would hurt the environment, and could result in impacting the farmers because of their dependency of the natural resources. Finally, natural disasters have a large impact on the Philippines. For example, in 2009 Typhoon Ketsana, also known as Ondoy, hit Manila, the capital, and poured down 16 inches of rain in a 12 hour span. ("Philippine Flood"). This caused terrible flooding and mudslides. Unfortunately, most of these issues are uncontrollable by humans, like natural disasters or significant climate change, so there is not much rural farm families can do about these. Rural farming families could control the amount of pollution that is created though, and help minimize the amounts of pollution that effect the environment.

I would recommend a variety of things because there seems to be more than one issue, although they all seem to have a central idea. First, I believe Filipino farmers should switch their agricultural practices to try crop rotation. This agricultural practice has many benefits. By rotating the crops every few years, it naturally helps keep insects and pests out of the crops because there would be different crops. This means that farmers have to spend less on pesticides, which in return saves them money. The use of fewer pesticides is less harmful to the soil. Crop rotation allows the farmers to use the same farmland and have crops on it every year. By planting crops in the ground each year, this prevents the erosion of soil. Another agricultural practice they might try to put in place is zero tillage. This practice is simply planting the next year's crop into the ground without tilling the ground before hand. Many benefits are attainable by doing this too. Not tilling the ground saves the farmers the effort, time and expense to till. By not tilling it also helps the environment by preventing a higher amount of soil erosion. Going with zero

tillage, the farmers would save money and prevent the destruction of the environment through soil erosion. A mutual benefit is the end result, where the farmers are able to save money to spend on other needed materials or expenses and the environment is not being degraded. Another practice the farmers might want to do is plant with genetic diversity. This helps in the long run with the prevention of diseases. If all farmers are planting the exact same crop or same crop with same genetic build up and a disease comes into contact, the entire food source could be jeopardized. By planting a wide genetic diversity of plants some crops may fail, but others may survive. This way there should always be stable production of food if something happens.

One general solution that could help solve a broad set of problems is implementing strategically placed conservation buffers. Conservation buffers are an array of different types of natural barriers which help prevent runoff into water sources, reduce soil erosion, create habitats for animals, and help keep the air clean. These buffers would be very beneficial in a farming point of view and an environmental point of view. For the smallholder farmers, building conservation buffers would be a wise move. Soil erosion has been a problem in the Philippines for many years. Conservation buffers would help this problem by creating a kind of wind block for the soil that blows away and act as a barrier to limit the runoff of soil. They would also absorb the extra surplus of water during heavy rains and remove up to 75% of the sediment in the runoff (Conservation Buffers). If the farmers are able to keep that fertile top layer of soil they will be able to produce more and better crops. A mutually helpful thing that conservation buffers do for the farmers and environment is prevent large amount of runoff into water sources. This provides a cleaner water source for the people in the Philippines. It also helps keep pesticides and fertilizers out of the water sources that end up poisoning the water. The conservation buffers would be able to remove up to 50% of the pesticides and surplus fertilizer nutrients (Conservation Buffers). When these chemicals get washed down into the oceans they affect the fish both in the rivers and the oceans. This has a negative effect on the already depleted fishing industry, due to pollution and overfishing of the Philippines. Preventing as much runoff as possible is very important. Conservation buffers also create habitats for the animals native to the area. The Philippines has a huge biodiversity, and there are many things that are only found here. For example, the Philippines eagle, tamaraw, pond turtle, Philippine flat-headed frog, and 70% of orchids are endemic to the Philippines (Philippines). Protecting this biodiversity is very important, and much of it has already been destroyed due to logging and clearing land for farming. By creating conservation buffers, they can act as small habitat areas for both plants and animals. Slowly by adding conservation buffers it would increase the forest coverage. Finally, conservation buffers can help with air pollution. Conservation buffers are built up of plants and trees, and like any plant or tree they help filter out the air, therefore providing cleaner air. In conclusion, by implementing new agricultural practices and conservation buffers small rural farmers should be able to take a large stride in providing a sustainable food source.

There are a few roles which would be helpful for different groups and organizations to assist the Philippines attain these kinds of changes. The smallholder farmers are not going to have enough funding to completely switch their agricultural practices. Also, to build a successful conservation buffer it takes careful planning and funding for the plants and the actual labor to build it. Donations for the funding would be a good start; though there is more to do than just handing over a sum of money. There needs to be some guidance and leadership to help these farmers actually follow through. The farmers need to see firsthand all the positives of implementing these new practices, and the successes, so by word of mouth these practices will be seen as a very beneficial thing to do. If the farmers do not see the many benefits for them and the environment then they will be less likely to convert over from their current practices. In general, these farmers need help getting started and understanding the importance and role for the first couple of years. After a few planting seasons the farmers should have the new systems under control and see the many benefits that result by following through with them. The agricultural practices will provide a

sustainable food source without degrading the environment. Also they will minimize soil erosion and land infertility. The environment will also become less polluted by runoff because of well planned conservation buffers that help clean out the fertilizer, pesticides, and sediment.

Minimizing environmental degradation associated with industrial agricultural practices can help resolve many problems that the Philippines have been faced with for years. It will exhibit a positive relationship between the farmers and the environment. Changing to new and better agricultural practices will improve the farmers' production and help prevent the degradation of the environment. Also, by implementing strategic conservation buffers both the farmers and the environment benefit. With careful measures, sustainability and agricultural practices are possible for the Philippines, which can look forward to a bright future.

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