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Poland, Factor 6: Sustainable Agriculture

Poland: Maintaining Sustainable Land

Since Poland was removed from communistic rule in 1989, the issue of pollution has begun to acquire well deserved attention. Under Stalin's rule, Poland had created an abundance of coal factories (especially in the southern area) to produce energy and provide jobs for the country. This has caused the air to become polluted with sulfur dioxide, BaP (Benzola(a)pyrene) particles (which are found in coal tar and car exhaust), and nitrogen oxide particles. When these pollutants combine with the water particles already in the atmosphere, it creates acid rain. This acid rain, along with other pollutants, are having adverse effects on Poland's environment. The pollution has not only affected the air unfortunately; ninety-five percent of the water in Poland was considered undrinkable in 1990, because it also contained fuel leakage and untreated sewage release. Poland has created some problems for its people, economically, environmentally and adverse health issues using these coal factories. The soil, water, and air are all affected by sulfur dioxide and nitrogen oxide particles emitted from the current primary energy source, the burning of coal. The soil is filled with waste from the factories, the air is contaminated with sulfur dioxide let off by the burning of coal, and the water is tainted by acid rain and other pollutants.

The pollutants in the environment cost families in Poland economically for a variety of health reasons. Burning coal releases fossil fuels into the air, contaminating it with sulfur dioxide and nitrogen oxide; creating an unhealthy environment to breathe in. In 1992, Poland had the world's twelfth highest level of industrial carbon dioxide emissions. *The British Journal of Obstetrics and Gynecology* reported a strong connection between pregnant womens' exposure to fossil fuel emissions and premature births. These pollutants have also led to an increase in the infant mortality rate, more circulatory diseases, and caused asthma to develop in a large portion of the younger population. A large population of children living closest to the coal factories have developed asthma from the pollution in the air. Adequate crop land is difficult to maintain in Poland. Though the health issues aren't always necessarily due to the lack of food produced and consumed; even if that is an issue because the lack of arable land consequently lost after the waste build up from the coal factories. As of 1991, Poland's IMR was over thirty deaths for every one thousand births. These health issues are only made worse by an overcrowded population in the southern portion of Poland. Eleven percent of Poland's population resides in Upper Silesia, leaving approximately eight thousand five hundred people for every one pharmacy. The primary health issues are due to the pollutants in the air. Unfortunately, health problems aren't only caused by the air pollutants; the pollution reaches the water and soil too. Coal factories are a large threat to health and welfare of the people because they exude sulfur dioxide, nitrogen oxide, and BaP particles into the atmosphere; and the waste from these factories accumulate in the soil. This polluted soil can also result in poisoning the food supply, causing birth defects, degraded I.Q, and other diseases. Twelve thousand hectares of land have been declared permanently unfit for tillage because of industrial waste deposition. This is twelve thousand hectares of land that could be used to plant cash crops in to make more of an income for the country.

A majority of Poland's forests are made primarily up of conifers. Conifers are excellent for timber and paper production; which could be used as a source of income as well. Unfortunately, two thirds of these forests have sustained damage due to the acid rain from the burning of the coal. The overexploitation of these forests during the second world war does not help matters either; four million acres of forest land were lost after World War 2. As of the mid nineteen nineties, seventy five percent of the forests had been destroyed by aid rain and air pollutants. Poland has been attempting to restore damage that began in 1939. This acid rain contaminates the water as well. The water is contaminated, making the amount of usable water minimal. Scarcity of water will take its toll on the families currently living in Poland. The population will not have enough potable water to consume and would be forced to spend more money to

purchase bottled water. This clean water and the tools needed to clean the water would cost money to import as well. Currently, two percent of Poland's renewable water is being used for farming, while sixty four percent is used for industrial purposes. These cities generate an average of 5.7 million tons of waste annually, and much of this waste has been released into the waterways, adding to the already polluted area. There are more than three hundred waste water treatment facilities in Poland, yet still the majority of the country's factories and towns still do not have waste purification facilities. If Poland were using its already scarce resources more sparingly, the production of crops and the population's health would increase dramatically. Coal-fired power plants emit mercury into the atmosphere which then settles into the bodies of water, contaminating the fish and water. Mercury is known to cause the development of autism and brain damage in very young children and infants. Water scarcity isn't necessarily the scarcity of water in general, it can also be the amount of water that isn't healthy to consume. Acid rain runs into the water along with untreated sewage release and fuel leakage. Ninety five percent of the water in Poland was considered undrinkable in 1990. As of right now, the water pollution in the Baltic Sea is ten times higher than average ocean water. Some of the most polluted waterways in Poland at the moment include the Wisla, Bolor, Nida, and Wisloka rivers. The amount of pollution in these rivers and the Baltic sea (which is a fairly popular tourist attraction) has led to an immense decrease in the amount of tourists making their way to Poland. This also leads to an economic downfall.

These pollutants also affect the agriculture of Poland economically. The soil is poor in large parts of central and northern Poland, making crop production difficult. The average farm family in Poland currently lives on a farm with less than twelve acres, (which is roughly 58,080 square yards), of land and an average of four children. The average farmers are subsistent farmers (farmers that grow crops to sustain themselves and their families), and are best known for producing potatoes, rye, and sugar beets. Poland often relies on imports to provide domestic supplies of wheat, feed grains, vegetable oil, and protein meals, which are generally insufficient to meet domestic demand. Currently there is a lack of food being consumed, due to the lack of food production. There are twelve thousand hectares, (a little over 46 miles), of what could be arable land that cannot be used because of the industrial waste accumulation near the coal factories. (Especially in Upper Silesia.) This land could be used to plant crops if it were fertile and healthy; not filled with sulfur dioxide pollutants and the factories' excess waste that affect not only the land but the health of both the people and livestock residing in Poland. If Poland can't produce enough of their major cash crops to provide for themselves, the people are forced to import necessities. If the country is importing more than they are exporting, no profit is being gained. Poland is stuck in a constant battle over health and economics; all because of the extreme amounts of pollutants coming from the coal factories. While most of these issues derived from the southern portion of Poland, they now affect the entire country, even the world in some situations. Fossil fuel powered plants are responsible for more than a third of the contributors causing global warming. The Vistula river is a major polluter of the Baltic Sea, and about half of Poland's lakes have been destroyed by acid rain. Many of these rivers run throughout Europe, spreading the pollutants.

All of these issues may seem blaringly obvious to some people outside of Poland, but to the population of Poland, things aren't quite as clear. A nationwide survey taken in 1992 reported that only one percent of Poland believed environmental issues were the largest problem for the country. However, seventy two percent rated economic issues as the largest dilemma. Many of the people residing in Poland realize the current economic situation is grave, but fail to realize why. Currently, Poland is planning to build not one, but two new coal factories, adding to the already large amount of pollution. Ninety percent of Poland's electricity is generated from coal. As of October fifteenth, 2013, Poland was declared to have the second dirtiest air in Europe, just below Bulgaria. Out of the ten most polluted cities in Europe, six of them are located in Poland. Because Poland is so densely populated, there are many coal factories set up throughout the country. These factories were originally placed in the most densely populated parts of Europe, and have continued to thrive there even after Poland's communistic days ended in 1989. During their time under communistic rule, Poland's main priority was providing enough electricity in these heavily populated areas. The trends of pollution have worsened and the situation for farmers is becoming

much more difficult with the higher levels of pollution. They spend large amounts of money in an attempt to fix issues caused by coal factories, and pay to continue to run coal industries, which only proves to worsen the economic situation. This difficult cycle can be broken through the introduction of new techniques for soil conservation and solar energy.

Resolving the issue of pollution will not only benefit the Polish people's health, but will also free more land to be used for planting necessities that are currently being imported from other countries. Reducing the pollution would help sustain the environment for a longer period of time. The environment is not the only factor affected by pollution; animals (primarily fish) suffer from repercussions as well. Cutting down the large percentage of pollution would also improve Poland's economy by reducing the amount of money spent on importing goods that could otherwise be produced in Poland itself. Energy demand is one of the large factors currently causing pollution in Poland. If this issue isn't resolved soon, Poland will only grow more unhealthy and continue to deteriorate. Fixing the issue of Poland's extensive pollution problem is simple. By discontinuing the use of coal factories, the amount of pollution will be reduced immensely. However, without coal factories, Poland will need other source of energy. One option would be the introduction of solar energy. Instead of more coal industries, Poland should be funding the construction of solar energy panels. Solar energy does not exude the same sulfur dioxide pollutants of coal factories. Solar energy is becoming increasingly more popular, and while fairly expensive initially, saves more money with less environmental impact. Rather than let off exhaust fumes and pollutants, solar energy uses panels to produce artificial photosynthesis and thermal energy to provide energy and electricity. The high prices to build solar energy will be reimbursed through savings on power bills, the reduction of health issues, and the altogether environmental improvement. Solving the issues in Poland will take more than simply replacing the coal factories however.

Once the solar panels have been placed accordingly, and coal factories have been shut down, the soil will need to be healed. This soil will be very delicate and extremely damaged because of the severe pollution problem. Since the soil is already weak due to the pollution, it will need to be treated delicately. By rotating the crops either each year or at the most every three years, the soil can be rejuvenated and protected from rodents, and the land will be given a chance to get nutrients back in to the soil to have sustainable crop production. This form of farming is called Crop Rotation. Crop rotation is the practice of growing a variety of different crops in the same soil in sequential seasons. Most farmers alternate between deep rooted and shallow rooted crops each year, allowing the soil to rest and stay fertile. Crop rotation will help restore the soil to its proper state in a healthy manner. A good example of crop rotation in Poland's situation would be alternating between potatoes and sweet corn. The chances of potatoes developing diseases if they are rotated annually decreases by forty percent. Another possible technique that could help would be zero tillage farming. Zero tillage farming is a way of growing crops year to year without disturbing the soil using tillage. This would give the soil a rest from constant tilling and allow it to gather the nutrients it will need to grow the necessary crops. By advertising the ways of zero-tillage farming and organizing groups to educate farmers about crop rotation, Poland will be capable of planting more cash crops to both consume and export.

Over the years, there have been a few attempts to restore Poland. Unfortunately, most of them have failed to accomplish very much. In the beginning, environmental planners had not managed to make many changes in fear of "making too drastic of a change" and "causing a severe economic disruption". Volunteers are difficult to acquire, because most people in Poland require two jobs in order to maintain a comfortable lifestyle, and don't possess the time to help. If other countries help educate Poland's farmers about crop rotation, they will be spared from furthering the damage to their soil, and possibly begin making more of an income. By attempting to persuade a couple of contracting companies in Poland to begin building houses with solar paneling or to install forms of solar energy sources in houses that are already built, they will make more of an income and the population will save money in the long run. Money will be saved through both the electric and doctor bills. Without the constant pollution in the air, many respiratory and blood diseases will decrease in large numbers. Infant mortality rates would

decrease, cases of asthma in children would no longer be as common, and the environment (including the animals and wildlife) would be spared from further damage.

There are many issues with Poland's environmental health, but by replacing the coal factories with solar energy and teaching the techniques of crop rotation to farmers, Poland can thrive once again. Poland has been attempting to fix their pollution issue since they were freed from communistic rule in 1989, but to no avail. They are still over polluted and that is mainly due to the immense amount of coal factories and the fact that ninety percent of the electricity and energy in Poland is powered by burning coal. Coal industries cost more to maintain and are more dangerous to the population's health than solar energy sources. They do not take up as much space either, which would leave more arable land for farmers to produce crops on. Even possibly the crops that are currently needed to be imported. Not needing to import other crops would assist with saving money for Poland so they can further help their agriculture. After replacing the coal factories with solar energy, farmers will need to be educated about crop rotation. This way the soil will be given the opportunity to restore itself. Poland has many environmental issues, but by replacing the coal factories with solar energy paneling on houses and businesses, and by advertising and educating farmers about crop rotation, Poland can be restored and thrive once again. Resolving the issue of pollution will not only benefit people's health, but will also free more land to be used for planting necessities that are currently being imported from other countries. Reducing pollution would sustain the environment for a longer period of time. Cutting down the amount of pollution in the atmosphere would improve Poland's economy immensely by reducing the supply of money being spent on importing goods that could otherwise be produced in Poland itself. Energy demand is one of the large factors currently causing pollution in Poland. If this issue isn't resolved soon, Poland will only grow more unhealthy and continue to deteriorate. Poland has many environmental issues, but by replacing the coal factories with solar energy sources and educating farmers about crop rotation and zero-tillage farming, Poland can thrive once again.

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