

Nicole Ferraro  
Susquehannock High School  
New Freedom, PA  
Peru, Factor 13

## **Market Barriers**

The country of Peru is located on the west coast of South America, and has three distinct regions. Peru has an arid coastline with the Pacific, is home to a portion of the Andes Mountains, and contains part of the Amazon rainforest on its border with Bolivia. Peru's labor force is 10.32 million, with only 0.7% of that force in agriculture, and 23.8% in industry, which would include the fisheries. Peruvians involved with fisheries and farming in the Andes face serious problems in market access and economic success. A typical subsistence farmer in Peru lives in the Andes Mountains or the rainforest. With little access to the outside world and almost no opportunity to attend school, it is difficult for these farmers to ever learn new strategies and techniques for agriculture. 44.5% of Peru's population is below the poverty line, and many of those people are the subsistence farmers. The highland farmers rely mainly on soups, potatoes, and rice as staples in their diet, and most grow what they eat themselves. Over seventy percent of the smallest farms in Peru are less than five hectares in size, with most of them located in the mountains. Most of the farmers grow just enough to live off of, and must supplement their income with other jobs. Only between 2.7% and 5.9% of the land in Peru is considered fit for agriculture, and of this, only 30% has an irrigation system in place. In the Andes, only about 20% of the crops produced reach markets. Only 10% of the agriculture in Peru is considered modern. This is located mainly on the coast, and involves the major export products, such as coffee. Roughly 35% of Peru's population lives in the rural areas, with 64% of these dependent on agriculture, and over 30% have no formal education. 4.5 million rural inhabitants live in poverty. Rural Peruvian farmers suffer from several market barriers, including climate, transportation infrastructure, and poor gender relations. Less money from anchovy harvests due to climate issues leads to a lower income and economy in the country, which leaves less money for infrastructure and gender relations improvement for the subsistence farmers.

Peru is greatly affected by the occurrence of El Niño, which in turn greatly affects the fisheries on Peru's coast. El Niño occurs every few years, when the air circulation pattern of the Pacific changes around the equator. Normally, without this change, winds push the warm water away from the coast, allowing upwelling to bring cold water with many nutrients to the surface. These nutrients then provide nourishment for plankton, which serve as food for the variety of fish in the region. El Niño prevents the upwelling of nutrients, so the plankton are not as plentiful and neither are the fish. Anchovy fisheries are an important economic staple in Peru. An intense El Niño can have detrimental affects on the harvest. In 1970, the anchovy harvest was above 12 million tons, but by 1973 had dropped to 1.3 million tons. The industry was considered no longer economically viable. This event coincided with an El Niño in 1972. The effects of the weather patterns coupled with overfishing caused this collapse to occur. The Food and Agriculture Organization of United Nations had warned that the anchovy population could not be sustainable if the yield exceeded 9.5 million tons. The anchovy population struggled to recover for nearly 30 years, with a promising increase in the nineties. This did not last long. The catch decreased again in 1998. The Peruvian government has limited the anchovy fishing industry's work week to only five days, and has also limited the length of the season. Both are positive steps. However, the industry has the capability to harvest more than the 9.5 million tons that has been deemed sustainable. With new technology, the processing of the anchovies has become more efficient and less expensive, causing companies to campaign to increase their harvest and their production and profits. Contributing to declining anchovy populations is the El Niño weather pattern. This occurrence causes a 3 degree Celsius increase in water temperature. As a result the phytoplankton and diatoms nearly disappear, leaving little food and nutrients for the organisms above them in the food chain. Anchovies migrate to deeper offshore waters, making them inaccessible to the Peruvian boats and the animals that feed on the anchovies. When

the El Niño current change and overfishing occur together, the industry suffers greatly, as do the Peruvian fishermen who make their living off the anchovies. Overfishing during an El Niño makes it difficult for the population to recover when the currents return to normal. Because fishermen are not able to harvest the anchovies they would normally bring to market, El Niño creates economic issues for the fishermen and the country's income. In this situation, it is not a question of infrastructure, but rather of policies to ensure that the anchovy industry in Peru does not disappear entirely.

In other parts of Peru, market access is a problem of infrastructure and money, rather than an environmental issue. The current situation in Peru makes it very difficult for farmers to transport their goods to market. The people of the Andes Mountains have no other way to make a living besides agriculture. They are isolated from more industrialized areas. Many do not speak Spanish. The people of the Andes are descended from the Incans and speak Quechua, and thus face a language barrier when they are able to bring goods to market. From personal experience, the roads to the mud brick homes in which these people live are barely fit for travel. None are paved. Occasionally one might see the people who work this land, dressed in their colorful homemade clothing, performing every task by hand. Technology has not reached these isolated regions. Even if children are able to travel the far distance to receive an education, eventually someone has to come back to work the farm. The manner in which farmers attempt to transport their goods to market is no longer adequate for their survival. The urban demands for products are penetrating the isolated Andes and the farmers must learn to adapt. Globalization and market expansion is leaving behind these antiquated farming methods, giving the advantage to commercialized farmers with better resource access. Potatoes are an important crop in the Andes, with over 3,000 varieties estimated to be cultivated by the Andean farmers. These farmers possess an extensive knowledge of these potatoes and the most effective ways in which to cultivate them. Potatoes grow best at higher altitudes where the less commercialized farms exist. They have typically been used for consumption by farmers and in local trade, as it is difficult to transport goods from that region to the cities and markets. Organizations are working on creating a niche for the native potatoes in the current markets in order to increase the level of living for the Andean farmers.

Not only do farmers in the Andes face market barriers, but those involved in agriculture in the Amazon are even more isolated. A person traveling to an Amazonian farm faces extreme difficulty. There is an airport in Puerto Maldonado, near the rainforest, but the airport is not equipped to handle more than one plane at a time. There are roads leading to the waterways through the rainforest, but they are more accurately described as dirt paths. The rivers function as the main mode of transportation for anyone wishing to travel around the rainforest, with small canoe like boats acting as the cars. Obviously, it is no easier for market goods to make this journey than for people. A rainforest farm is very diverse, consisting of banana trees, yucca plants, and pineapple plants, among others. The labor that goes into harvesting all of these crops is unimaginable. There is no electricity in the rainforest, or running water. The farmers manually harvest all of their crops. They collect and prepare their goods and then leave what they plan to sell by the river bank. A boat comes by every so often to collect the goods and take them to market. For the amount of labor that goes into preparing these crops, the profits are not nearly enough. The farmers also have little control over their goods once that boat comes to take them to market. The farmers take a risk in trusting others to take their only source of income to market, but they have no other option. Bringing technology to these people may cause as many problems as it solves in both the Andes and the Amazon. For instance, providing electricity in the Amazon could be achieved by damming part of the river. For these people, the river is a part of their life. The river is the only way to travel. The people use the water for many of their daily needs. While using hydroelectric power may help to create more effective farming techniques, the impact from the loss of flowing water on these people would be huge. It could also interfere with the habitat of some native creatures, such as the caiman or the capybara in the Amazon. The farmers in both of these isolated regions have great difficulty in transporting their goods to market, and earning a living off the products they are able to sell.

Women in Peru have less opportunity than men for market access, which affects many farms where women play primary roles. Women are in charge of family activities as well as increasingly sharing the responsibility for farm management with men. This burden contributes to the poverty of women in this region. The Rural Roads program in Peru was implemented in order to improve roads and reduce travel time to markets, but have not had a great impact on the ability of women to access the markets, as well as other services. Health services are too expensive for the subsistence farmers in the area, where men have control over the limited cash available. These improved roads have also increased the ability of rural families to give their children an education. In the highlands, however, only men have a real opportunity to continue their education. These rehabilitated roads have led to an increase in the participation of women in the markets. Their ability to reach the markets, despite the roads, is limited by their perishable products, the amount of goods they bring, the scarcity of services, and the fact that women must bring their children along. These factors mean that the time women have to go to market and sell their goods is very limited. The Rural Roads Project was a worthy goal, but history has proven that roads alone do not alleviate rural poverty. The project lacked any policy for including, and improving the lives of women. Areas where women are educated and have more control over their own lives are the more developed and economically stable countries. While the improved roads do increase women's access to information and more technology, they have little or no time in order to become more educated. The treatment of women in the Andean region provides a market barrier because the women are not able to bring all of their goods to market in a timely manner and make a good profit.

Peruvians suffer from issues with climate, road structure, and gender relations in transporting their goods to market. There are several ways in which the situation in Peru can be improved. El Niño affects not only the anchovy harvest, but can also have a devastating impact on poor women and children who, in times of good weather, already have little access to healthcare or resources. When El Niño destroys crops they experience even greater food insecurity. Unequal distribution of food in households between men and women exist in Peru even when the weather patterns are normal. The change in ocean currents can cause widespread malnutrition and increased risk of diseases, such as malaria and cholera, because the change in climate causes heavy rainfall, which leads to soil, forest, and crop degradation, as well as flooding. These areas are ill-equipped to deal with the consequences of such events. The increased migration of men out of the highlands into coastal regions and valleys in search of employment has left many women in charge of the households. Such households have an even greater challenge during El Niño times, because women are not recognized as equal to men and with the larger burden of house work and agricultural labor, women-run households often suffer the most. National economic policy in Peru is focused mainly on exports, which is where most of the country makes money. The agricultural regions often are forgotten when forming national policy. The corruption present in Peru's government also presents issues. According to the 2010 Index of Economic Freedom, they receive a score of 36 out of 100 on a freedom from corruption scale. Should the U.S., who is the Peru's largest receiver of exports, decide to stop engaging in trade with such a corrupt country, Peru's economy could be devastated. Smallholder farmers need to learn how to adapt to today's markets so that if such an event were to occur, they have business knowledge to survive. The combination of El Niño devastation and national policy has helped lead to the poverty and market access difficulty in rural Peru. Improving gender relations in Peru and giving women more power and recognition may help to lessen their burden during the El Niño phenomenon.

In addition to poor road infrastructure, rural farmers lack the knowledge to improve their lives. While improved transportation would help, farmers also need to have access to niche markets and credit, as well as new skills and strategies in order to be successful. For smallholder farmers, the concept of globalization creates a greater market risk, as well as greater opportunity. Larger market demands are challenging for rural farmers though who possess little technical or financial resources. As the world grows increasingly focuses on business and capitalism, rural farmers must acquire the skills to survive in the new markets. The new global markets are not suited to a sustainable farmer's needs, which is why

rural farmers must tap into the niche markets, such as growing organic bananas or gourmet coffees, in order to survive. The anchovy industry demonstrates how niche markets could also greatly harm the smallholder farmers. When a group of people are dependent on one specific good to make a profit an event such as El Niño can have a devastating effect on the people. Those who were entirely dependent on the anchovy harvest suffered greatly during El Niño times. If Andean farmers are to focus on only one specific type of banana, for instance, that may help them become more efficient when planting, and to have a better hold on the market. Unfortunately, they run the risk of having that one staple crop destroyed, and losing their income. Niche markets could also have an affect on biodiversity. Andean farmers are very adept at growing a wide variety of potatoes. One way the idea of niche markets could be reconciled with the risk of only growing one plant is to create a specific market for the native potatoes. The Andean people possess generations' worth of knowledge on cultivating these different types of potatoes, and while traditionally they are used in local trade and consumption, creating a market for these potatoes on the global scale could help to improve the market access for these farmers.

Improvement in gender relations in Peru would have a definite positive impact on the smallholder farmers. Women tend to highly value road safety, and thus rehabilitated roads would increase their willingness to travel, especially since they often need to bring along children. Organizations for women increase their participation in community issues and can result in a better understanding of the burdens placed on these women and how they can be lessened. Women also suffer from major time constraints because they are in charge of household work, as well as providing support to their husbands. Should the government provide affordable transport services for goods and safer roads and if they take the needs of women into account, this could greatly improve the lives of women, which usually leads to a more developed society.

The drug trade in narcotics is a big part of the Peruvian economy, as they are the second largest cocaine producer in the region. Poor Peruvian farmers with limited market access are more likely to engage in the drug trade. While it is not a federal offense to produce coca leaves in Peru, the government is under pressure from the United States to control the drug industry. The empowerment of women could lead to a decrease in the drug trade in Peru, as women would be less likely to endanger their family in such an industry. With Peru's involvement in the narcotics industry lessened, they could cement their position as an important exporter to the United States. Growing coca has been a part of Peru's agriculture for a long time. Many farmers depend on this income to support their families. If market access is increased and markets were created for the crops grown in the Andean region the dependence on the drug industry could be decreased.

There is no one solution to the problems in Peru. Each action taken has consequences that could create more problems. The importance of the smallholder farmers in the country needs to be recognized and helping those farmers increase their ability to sell their crops and make a profit will help to increase the overall economic stability of the country. The government corruption and the country's involvement in the cocaine industry are both issues that will take a long time to overcome. By creating safer roads that women will be willing to travel, a market for the crops unique to the Andes, and policies that prevent overfishing and preserve biodiversity, smallholder farmers would have a better chance at economic success. Any solution that would create a lasting impact will take a great amount of time to implement and work. Long term change must occur in order to ensure that the smallholder farms continue to operate and are able to adapt to the changing global market. They are an important part of the economy of many nations. World Food Prize founder Norman Borlaug once said that, "I am but one member of a vast team made up of many organizations, officials, thousands of scientists, and millions of farmers - mostly small and humble - who for many years have been fighting a quiet, oftentimes losing war on the food production front." Helping smallholder farmers to achieve economic success in a technology driven, instant gratification world will not be easy. It will require the cooperation of many governments and people to ensure that these farmers are able to compete in global market

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