

An Open Source Anticipatory Intelligence Report on Peru

Prepared for the National Geospatial-Intelligence Agency



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In the world of geointelligence, information and access are the keys that are revolutionizing the industry and, in doing so, are changing the way GIS is used everywhere. The technological boom of the 21st century keeps pushing new scientific borders, forcing a constant race to have capacity meet demand while being overwhelmed with information and data. In the struggle to manage the ever expanding sea of information, locations of interest generate and consume huge amounts of resources from the intelligence community. Egypt, China, Russia, the dynamic of the European Union and the mixing pot that is currently South America make for a massive amount of interest zones and carry with their current troubles the interest of the rest of the world. But while big issues attract big attention, the rest of the world doesn't stop spinning in places where there is less interest. In this context the NGA further expanded its peripheral vision capabilities with the burgeoning field of open source information. Director Ted Cope and the GIS program coordinator for Washington College, Stewart Bruce, developed an open source anticipatory research program for students with the peripheral agenda of the NGA in mind, looking into Peru.

The open source anticipatory research program was designed on the premise of providing a base analysis for peripheral countries through student drive investigation. With the intention of student tasked open source investigation. Student researchers delved into any and all available open source information regarding Peru and developed an analysis of the country based on three focus areas: energy, water, and demographics. Each area was distributed among the Washington College faculty leaders and each faculty member oversaw and assisted three student researchers. The faculty members for the program were GIS program coordinator Stewart Bruce, Anthropology Program Director Dr. Aaron Lampman and Director of International Studies Dr. Andrew Oros, respectively. The list provided by Dr. Beth Driver served as the starting point to

selecting the country and later developing the three focus areas. The initial questions the groups set out to develop were raw templates for the pilot project to develop upon. Washington College's previous relationship with Peru and the specific nature of its geography made it the most likely candidate for research.

Peru was chosen because Washington College has current ties with the country as the Chesapeake Semester Program travels there each year and one of the faculty members assisting on the project, Dr. Lampman, had traveled within the country on multiple occasions. Peru was also a prime candidate due to its status as a peripheral country.

According to the list provided by Dr. Driver, the end report for the project was to recognize the current problems for the country, the possibilities for future development and to look into the events that were ongoing. In the interest of doing so, each of the three focus areas had three student researchers who each developed a subject of interest. In this way, the demographics team looked into fertility, drug trafficking and human trafficking. The water team looked into the political/regional instability caused by scarcity, mining and its effects on the water, and the privatization of water. The energy team looked into current and future issues with the electrical grid, the distribution and generation capacities and deficiencies, and the indigenous concerns regarding foreign interests.

Demographics

“Peru has made great strides in development, with strong growth, low inflation, macroeconomic stability, high international reserve accumulation, external debt reduction, achievement of investment grade status, fiscal surpluses, poverty reduction and progress in social sectors.”¹ According to the World Bank, Peru has a literacy rate of 90% as of 2007 and urban development has increased from 74% in 1995 to 81% in 2008.² However access to resources such as water and health care is unevenly distributed amongst those living in rural and urban areas. Urban areas receive a majority of the resources, providing rural areas with few opportunities for economic and social betterment.³ While the percentage of those living below the poverty line has steadily decreased from 54.3% in 2002 to 31.3% in 2010, more than half the country’s people living at or below the poverty line reside in rural areas.⁴ Most indigenous peoples live in extreme rural areas and 73% of indigenous Quechua and Aymara communities, more than 5 million people, live below the poverty line.⁵ Therefore, a majority of those living in rural areas are poor and must resort to any means of supporting them and their families, including migration to urban areas for work or entering drug and human trafficking.

The greatest inequalities between urban and rural areas were found in the areas of fertility, human trafficking, and drug trafficking. These three demographic issues create the greatest possible threat(s) to the future growth of Peru’s economy, government, and social equalities. Unequal distribution of goods, services, and crime rates within the two areas could continue to be a problem should these three topics remain unresolved.

¹ The World Bank: “WB: US\$50 Million to Improve Health, Nutrition and Education in Peru,” 2011, <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/LACEXT/PERUEXTN/0,,contentMDK:22252133~pagePK:1497618~piPK:217854~theSitePK:343623,00.html>.

² The World Bank: “Data: Peru,” 2012, <http://data.worldbank.org/country/peru>.

³ IFAD: “Rural Poverty in Peru,” 2009, <http://www.ruralpovertyportal.org/web/guest/country/home/tags/peru>.

⁴ World Bank, 2012

⁵ World Bank, 2009

Fertility

As the average life expectancy increases and fertility rates decrease across the globe, an aging population has begun to present financial difficulties. We have already begun to see the effects an aging population has on developed nations such as the United States, where government issued programs for senior citizens have begun to disappear over the last two decades due to a shortage in the number of working-aged citizens available to provide funds for government programs such as Social Security. However, in developing nations like Peru, a decrease in fertility rates combined with an increase in life expectancy creates potential problems for Peru's economy when the working force is depleted due to a decrease in able bodies and an increase in senior citizens unable to work.

Currently, Peru faces a dilemma regarding its population. As of 2011, the average life expectancy in Peru was 72.47, versus the United States, where the average life expectancy was 78.37.⁶ The data shows that more citizens are living

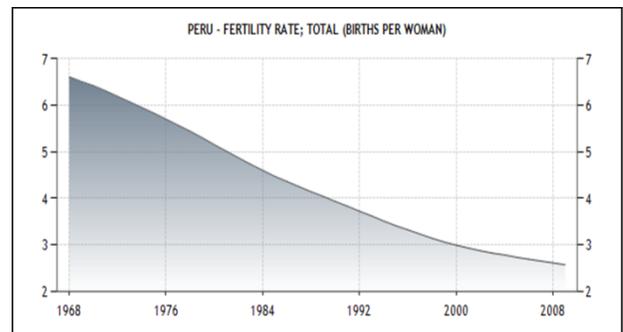


Chart 1

longer while women are having fewer children, as seen in Peru where women have an average of 2.32 children over the course of their lives, which is similar to the number of children per women in the United States.⁷ When the data is combined, it has been found that the fertility rates in both Peru and developed nations like the United States are not high enough to significantly replace the population. Since the life expectancy has increased and, therefore, citizens are living longer, more able-bodied citizens are needed to provide for the senior citizens, who no longer contribute

⁶ CIA World Factbook: "South America: Peru," last modified 19 December 2011, <https://www.cia.gov/library/publications/the-world-factbook/geos/pe.html>.

⁷ Ibid.

to the economy (see charts 2 and 3).⁸ Instead, senior citizens take from the economy and because fertility rates in Peru have gone down to roughly 2 children per woman, as seen in Chart 1, the next generation of white-collar workers will not generate the profit needed to sustain Peru’s economy since income growth may become harder to attain.⁹

While the United States is a developed nation that has the net wealth capable of withstanding a temporary labor shortage caused by a greying population, Peru does not. Like other Latin American countries, Peru was a rural country that relied heavily on agriculture until its government, with the aid of organizations such as The World Bank, began to industrialize and modernize. It began to focus on improving the quality of social services such as health, nutrition, and education available to its citizens with the aid of loans. The

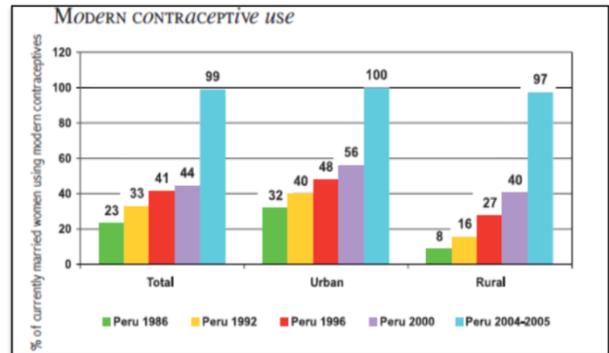
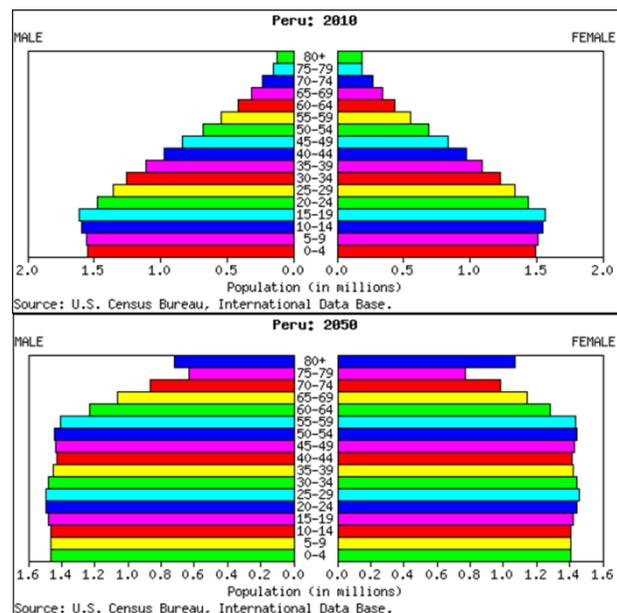


Table 1



Charts 2 and 3

World Bank gave a loan of US\$50 million on December 10, 2010 to Peru’s government in order to contribute to the government’s efforts to continue to improve the quality and accessibility of

⁸ NationMaster: “Age Distribution,” 2012, http://www.nationmaster.com/country/pe-peru/Age-_distribution

⁹ The World Bank, *Population Aging: Is Latin America Ready* (World Bank: January 4, 2011), <http://issuu.com/world.bank.publications/docs/9780821384879?mode=window&pageNumber=1>

social services.¹⁰ With these loans free contraception has been made available to Peruvian women (this can be seen in table 1) where a total of 99% of women in both urban and rural areas are using contraception, contributing to the decrease in fertility rates and, consequently, the decrease in future labor forces.¹¹ However, what the graph fails to account for are the women living in extreme rural areas, where a majority of the women do not have access to contraception. Consequently, the data appears unreliable. As *Population Aging: Is Latin America Ready?* has stated, “a high portion of economically dependent persons in the population (children and older persons) usually constrains economic growth, because a significant portion of resources is allocated to attend to their needs.”¹² Peru’s government must provide health care for its growing number of senior citizens, meaning that the loans the World Bank has given Peru will be used to provide for its senior citizens rather than the education of its youth. Thus, Peru may cut funds from needed areas, such as education, in order to provide for its growing numbers of senior citizens, or risk leaving a majority of its aging population in conditions of poverty.

The data comparing rural and urban areas appears to present a contradiction. Although 46% of births take place in rural areas, people living in rural areas lack access to health care so the research conducted by WHO (table 1) is unreliable.¹³ According to table 1, 99% of women living in rural areas are using contraception. Yet, rural areas lack access to health care. This is showcased by the fact that Peru has one of the highest economic gaps between the rich and poor in all Latin American countries. In fact, 34.8% of the population is below the poverty line, which is placed at a daily income of \$1.25 (US), and a majority of those who live below the poverty

¹⁰World Bank, 2011

¹¹ World Bank, 2012

¹² Ibid

¹³ WHO, “Peru: Country Profile,” 2004, http://www.who.int/making_pregnancy_safer/countries/per.pdf.

line live in rural areas, where women and children are among the poorest.¹⁴ Therefore, how is it possible that 99% of women in rural areas use contraception?

According to another chart in the same research conducted by WHO, the economic gap is transparent. Analyzing chart 4 shows that far more married women living in urban areas use contraception.¹⁵

For example, 59% of married women in an urban area known as the Region natural: Lima Metropolitan used contraception in 2000 versus the 34% of married women in a rural area called Martiagui who used contraception.¹⁶ When compared with

the labor children perform in rural areas, the

use of contraception seems counterproductive since contraception reduces fertility rates in rural areas where children are needed to help with agricultural work.¹⁷ When coupled with the fact that more families are migrating to urban areas where work is available and access to services is far greater, agricultural production suffers, affecting the economy.

Since Peru has begun its process of modernization, it has seen an increase in its life expectancy, a strengthening of its economy, and advances in social services available to its people. However, these improvements have led to problems that could potentially derail Peru's development. By 2050 it is estimated that the number of senior citizens (those over 60) will have

MODERN CONTRACEPTIVE use BY SUBREGION (2)

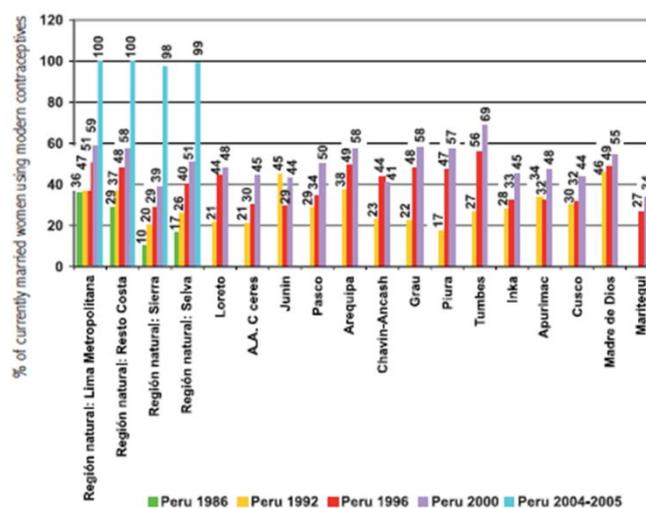


Chart 4

¹⁴ CIA World Factbook, 2011.

¹⁵ WHO, 2004

¹⁶ Ibid.

¹⁷ IFAD, 2009.

more than tripled, creating an aging population incapable of maintaining Peru's current economic growth.¹⁸ Although a decrease in fertility rates will cause a labor shortage in the near future, people living in rural areas will move to urban areas to fill better paying jobs, creating more of an economic gap between rural and urban areas as agricultural areas will be affected by the increasing numbers of those migrating to urban areas.

In current times Peru's rural population has seen a decrease in family size that has changed its agricultural based economy. With families, especially men and children, migrating to rural areas for work, women represent as much as 80 percent of the family's labor force.¹⁹ Yet, 70 percent of women in rural areas are extremely poor and, because families can make more revenue engaging in other work such as human trafficking and drug trafficking, crime rates continue to remain high. Crime rates could potentially increase if rural areas are extremely affected financially by an aging population, forcing individuals living in rural areas to continue to rely on other revenue generating activities like human and drug trafficking (see human trafficking and drug trafficking sections for more information relating to crime rates).

Drug Trafficking

Latin America and Cocaine production and distribution have been synonymous for the past several decades. Governments have been working to try to eradicate the problems associated with drugs such as increased violence and corruption. These problems can be seen clearly in the ongoing Mexican Drug War and Colombia's fight against drugs. Peru could easily fall into violence if the levels of drug production and corruption continue.

¹⁸ NationMaster, 2012.

¹⁹ IFAD, 2009.

The Coca leaf, the base of cocaine, has been grown in Latin America for centuries and is used in traditional religious ceremonies and for traditional medicinal purposes.²⁰ Taking these facts into account the Peruvian Government has been working to remove the illegal production of cocaine and distribution networks without infringing on cultural beliefs by placing laws on growing coca. The problem that is being faced is that the majority of coca is going towards production of cocaine despite it being used for traditional purposes. In a survey conducted by the “National Institute of Statistics and Informatics” in Peru out of 27 million Peruvians only 4 million are using the coca leaf in traditional ways.²¹ This creates a major problem for the government who is trying to balance keeping coca production legal for traditional purposes and fighting cocaine production.

Peru now stands second behind Colombia in production of coca.²² Production of coca has decreased substantially over the past decade due, in part, to a rise in illicit crop prices but also due, more recently, to an upward trend in cultivation.²³ Cultivation in Peru during 2010 was estimated to be about 120,500 metric tons of dried coca leaf compared to Colombia’s production of 396,900 metric tons of oven dried and fresh leaf.²⁴ Colombia shows a decrease in production of cocaine while data collected in Peru shows a steady incline with production increasing steadily since 2007 (107,800 (mt) in 2007, 113,300 (mt) in 2008 and 119,00 (mt) in 2009).²⁵

²⁰ BBC: “Bolivia and Peru defend Cocaine use,” 6 March 2008, <http://news.bbc.co.uk/2/hi/americas/7280906.stm>

²¹ Voltairenet.org: “La lucha contra el narcotrafico en Peru,” Last Modified November 26, 2004, <http://www.voltairenet.org/La-lucha-contr-el-narcotrafico-en>

²² CIA World Fact Book: “Field Listings: Illicit Drugs,” 28 October 2011, <https://www.cia.gov/library/publications/the-world-factbook/fields/2086.html>

²³ United Nations Office on Drugs and Crime: “World Drug Report 2011,” 2011 http://www.unodc.org/documents/data-and-analysis/WDR2011/World_Drug_Report_2011_ebook.pdf

²⁴ Ibid.

²⁵ Ibid.

Cultivation of the coca leaf itself once dominated the market but a change in the past several years has been seen which includes growing, production and refining cocaine.²⁶ The change from cultivation to drug production brings corruption, violence and environmental consequences. Refining cocaine requires a host of chemicals such as sulphuric acid, potassium permanganate and benzoyl; all of these chemicals pose a very real danger to human and environmental health.²⁷ Chemicals used in these processes are not disposed of in an environmentally friendly fashion instead chemicals are dumped into rivers, streams or on the ground.²⁸ This contaminates an already diminishing water supply and makes land unusable to grow on.

Production centers on a few main regions in Peru. Cultivation is occurring in rural regions of the country, namely mountainous regions, and it is occurring in very poor areas. Eight percent of Peru's population is living below the international poverty line of \$1.25 per day; of this it is believed that 1/4th of all rural dwelling people are living in extreme poverty.²⁹ A drug runner in Peru can make up to \$500 dollars a trip.³⁰ The amount of money that can be made running drugs is sustainably more than if they worked a legitimate job. For example they have the chance to earn as much as an airline pilot in Peru which in 2005 earned a net monthly salary of \$2,074.³¹

The Peruvian Government's eradication efforts of cocaine and other drugs center on voluntary eradication and the stopping drug trafficking. Over all, Peru has been successful in

²⁶ Transnational Institute: "Drug Trafficking in Peru," November 2005, http://www.tni.org/archives/archives_soberon_scenario-e

²⁷ Cocaine.org: "Processing" Last Accessed November 15, 2011 <http://cocaine.org/process.html>

²⁸ CEDRO: "Impacts of Drugs on Peru," Last Modified 2003, <http://www.cedro.org.pe/english/publicaciones/impacto3.htm>

²⁹ Rural Poverty Portal: "Rural Poverty In Peru," 24 November 2011 <http://www.ruralpovertyportal.org/web/guest/country/home/tags/peru>

³⁰ BBC News: "Peru's Challenge to Tackle Cocaine Trade," 23 June 2011, <http://www.bbc.co.uk/news/world-latin-america-13875321>

³¹ World Salaries: Peru Average Salaries & Expenditures, " 9 January 2012 <http://www.worldsalaries.org/peru.shtml>

fighting the drug trade until recently when cultivation and production again started to increase.³² Eradication of the coca bush is done either voluntarily or forced but it is all done manually in Peru; this is compared to Colombia where the government uses other means such as herbicides and burning.³³ Even though Peru is actively trying to eradicate coca the government is not offering any support to grow other crops which is forcing farmers into even more remote regions with less governmental control.³⁴ Without support from the government to change what they are growing farmers are likely to keep moving their plots into more remote regions. Peru has realized that its eradication programs are failing and has currently suspended all eradication programs until evaluations can be made.³⁵

The Peruvian Government has been actively fighting drug trafficking. The Government was able to successfully slow it via air during the late 90's causing traffickers to resort to other means such as moving drugs via river and foot.³⁶ A lot of the river trafficking routes centers around "the river corridor made up of the Marañon and Ucayali rivers" which connect into Brazil and Colombia; Peru's response to the alteration of trafficking involved outfitting river ships for interception and interdiction.³⁷ Lately drugs have been moved to coastline ports where they can then be transported via ships.³⁸ Peru is working hard to actively fight drug trafficking on all fronts and has even established multiple new bases along the Colombian and Brazilian border.³⁹

³² Embassy of Peru: "Bilateral Relations-Fight Against Drugs," 29 October 2011, <http://www.peruvianembassy.us/do.php?p=25>

³³ United Nations, 2011.

³⁴ Global Post: "Cocaine's Becoming King in Peru," Last Modified September 24, 2011, <http://www.globalpost.com/dispatch/news/regions/americas/110923/cocaine-growth-has-peru-changing-tactics>

³⁵ Los Angeles Times: Peru suspends coca eradication program, " 18 August 2011 <http://articles.latimes.com/2011/aug/18/world/la-fg-peru-cocaine-20110818>

³⁶ Peruvian Embassy, 2011.

³⁷ Transnational Institute: "Drug Trafficking in Peru," November 2005, http://www.tni.org/archives/archives_soberon_scenario-e

³⁸ Ibid.

³⁹ Andean Air Mail & Peruvian Times: "Peru to install counter-narcotics bases in Brazil, Colombia border region," 14 September 2010, <http://www.peruviantimes.com/14/peru-to-install-counter-narcotics-bases-in-brazil-colombia-border-region/8110/>

Lately though it is believed that Peruvian producers are bypassing Colombia and instead moving them into Mexico with help from Mexican Cartels.⁴⁰ This new challenge to Peruvian authorities has led to violence and problems that could quickly expand to hurt the government's efforts at fighting the cultivation and production of drugs.

Drugs and drug running bring a host of problems including corruption in the government and violence in the streets. Mexican Cartel influence has increased in Peru since 2007.⁴¹ It is believed that 80% of drug production is being financed by Mexican Cartels where in previous years Colombian Cartels controlled the market.⁴² The Peruvian government has arrested 70 Mexicans for drug running and has stopped large shipments of cocaine from leaving the country.⁴³ All of this is not without violence with 60 police and army officers killed in the past 3 years and another 20 killed were recently killed by guerillas believed to be connected to the Sinaloa Cartel.⁴⁴ During September of 2008 Peruvian police arrested 20 people suspected of working for the Sinaloa Cartel and seized 2.5 tons of cocaine.⁴⁵

The Peruvian Military and Police force are fighting violence and corruption but money from cocaine can easily undermine the work that is being done. Corruption within Peru's military and police force is a major problem. Recently within Peru's military a fraud has been discovered that is directly tied to cocaine. The military has been taking bribes from drug runners, letting them use military vehicles and bases to pack and transport drugs and selling drug producers' excess fuel.⁴⁶ There is speculation that General Paul da Silva, the current leader of

⁴⁰ Ibid.

⁴¹ Ibid.

⁴² Ibid.

⁴³ Ibid.

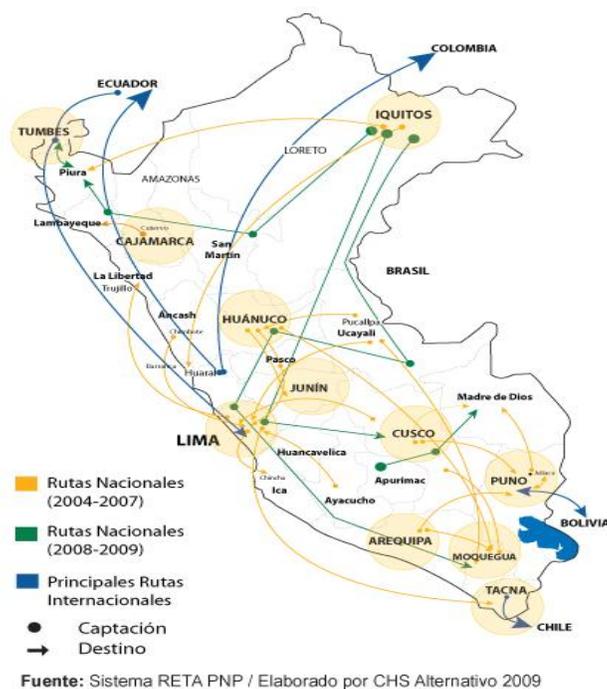
⁴⁴ Ibid.

⁴⁵ Reuters: "Garcia blames Mexican drug cartels for Peru violence," 29 November 2011 <http://www.reuters.com/article/2008/11/27/us-peru-drugs-idUSTRE4AQ7LG20081127>

⁴⁶ WikiLeaks: "Peruvian Army Connected to Drug Trafficking," 14 December 2010, <http://insightcrime.org/insight-latest-news/item/336-wikileaks-peruvian-general-connected-to-drug-trafficking>

Peru's army, was connected to drug running between the military and a fish packing operation that was exporting drugs in its fish (Note: these are only allegations Da Silva has never been charged).⁴⁷ Over the past few years 18 anti-drug police officers have been arrested for transporting drugs in police vehicles to drug safe houses.⁴⁸ Of these officers that have been arrested two were captains and one is a mayor meaning the corruption extends beyond the general work force and into the leaders of the government agencies.⁴⁹ Making matters worse, there is a lack of convictions against corruption with ties to the drug trade. In 2010, 11 officers arrested only one was suspended from duty.⁵⁰

Peru is a stable and growing country that stands on the brink of violence and corruption on a large scale. This is due to the fact that cultivation and production of cocaine has increased dramatically in Peru while decreasing in neighboring countries. The lack of laws regarding cultivation in Peru as well as the government offering little to no assistance to the poor farmers who are planting coca leads to an increased production in more remote areas of the country. The social and economic divides between the people living in the rural and urban regions will lead to more cultivation or trafficking due to the amount of money



⁴⁷ Newsmaxworld: "Peru's Military Chief Accused of Drug Corruption," 13 December 2010 http://www.newsmaxworld.com/the_americas/WikiLeaks_Peru/2010/12/13/366708.html

⁴⁸ In Sight: "Corrupt Cops in Peru Remain On duty," 25 March 2011 <http://insightcrime.org/insight-latest-news/item/714-corrupt-cops-in-peru-remain-on-duty>

⁴⁹ Ibid.

⁵⁰ Ibid.

that can be made illegally compared to what they can make legally. Change in control of the drug trade by Mexican Cartels will increase violence as can be seen in their home country. The growing levels of coca cultivation and cocaine production in Peru could lead to internal strife and violence similar to the drug war in Mexico. The growing drug trade in Peru is a major problem that can lead to internal strife.

Human Trafficking

Human trafficking is considered by many to be a modern day form of slavery. Human trafficking refers to the “renting, buying, and selling of human beings.”⁵¹ It is estimated that over 200,000 Peruvians are sold into forced labor or sex trafficking.⁵² Peru is a source for victims, a transit location for victims and a country of destination for victims. Men, women, and children can fall victim to human traffickers and may be exposed to forced labor and sex trafficking.⁵³ However, women and children are more likely to fall victim because they are more likely to live in poverty than men and are therefore more easily enticed by the allure of the promise of work.⁵⁴ The three main destinations for human trafficking within Peru are the Madre de Dios province, Cuzco, and Lima. By following the routes shown on the map to the right, the victims of human trafficking are being taken from the rural areas and are being brought to the more urban centers like Cuzco and Lima.⁵⁵ While internal human trafficking remains the greatest threat to Peru, there are a significant number of cases that occur externally. The primary destinations for those victims who are trafficked externally are: Spain, Italy, Japan, the United States, Argentina, Chile,

⁵¹ United States Department of State, *2011 Trafficking in Persons Report- Peru*, 27 June 2011, <http://www.unhcr.org/refworld/category/COI,,,PER,4e12ee534b,0.html>.

⁵² Maureen Taft- Morales, “Peru: Current Conditions and U.S. Relations,” *Congressional Research Service*, Congressional Research Service (2009), <http://www.fas.org/sgp/crs/row/R40716.pdf>.

⁵³ United States Department of State, 2011.

⁵⁴ *Ethical Traveler*, Campaign Against Human Trafficking in Peru’s Sex Tourism Industry (2010), <http://www.ethicaltraveler.org/act/campaign-against-human-trafficking-in-perus-sex-tourism-industry/>.

⁵⁵ *Capital Humano y Social Alternativo*, “Several Routes Detected Nationally (2010),” <http://www.chsalternativo.org/contenido.php?men=L&pad=32&hij=37&shi=61&pla=2&sal=2&id=I>.

Ecuador, and Brazil.⁵⁶ According to the United States State Department Peru is classified as a Tier 2 human trafficking country. Tier 2 countries are “Countries whose governments do not fully comply with the TVPA’s (Trafficking Victims Protection Act) minimum standards, but are making significant efforts to bring themselves into compliance with those standards.”⁵⁷ Therefore, while Peru is not considered to be as high a risk as other countries for human trafficking there is still a significant amount of sex trafficking and forced labor.

The majority of cases of human trafficking in Peru involve sex trafficking. Women and children are the most at risk to fall victim. According to an article in the Peruvian Times 92.7% of all cases of human trafficking involve girls and adolescent women who are sold into the sex industry.⁵⁸ Women and children are targeted in the rural Andean regions of Peru; they are captured or sold to traffickers and are then brought to the urban cities in Peru. According to another article in the Peruvian Times, women and children are forced from the rural regions and are brought to the urban regions and are forced to sell sexual services for 50 soles, which is approximately \$17.⁵⁹ These women and girls are subject to extreme working conditions and harsh treatment. Peru also has a significant child sex tourism industry in Lima and Cuzco.⁶⁰ The United Nations Committee on the Rights of the Child estimates that 500,000 children have been sold into the sex industry in Peru.⁶¹ Not only are children being sold into the child sex tourism industry in the major cities such as Lima and Cuzco but they are also being forced to work as sex

⁵⁶ United States Department of State, 2011.

⁵⁷ United States Department of State, *Trafficking in Persons Report 2010- Tier Placement*, <http://www.state.gov/g/tip/rls/tiprpt/2010/142755.htm>.

⁵⁸ *Andean Air Mail and PERUVIAN TIMES*, “Authorities rescue about 200 victims of human trafficking this year,” 29 September 2010, <http://www.peruviantimes.com/29/authorities-rescue-about-200-victims-of-human-trafficking-this-year/9273/>.

⁵⁹ *Andean Air Mail and PERUVIAN TIMES*, “Cuzco new “hot- spot” of human trafficking in Peru,” 16 September 2008, <http://www.peruviantimes.com/26/cuzco-new-“hot-spot”-of-human-trafficking-in-peru/624/>.

⁶⁰ United States Department of State, 2011.

⁶¹ *Ethical Traveler*, Campaign Against Human Trafficking in Peru’s Sex Tourism Industry, <http://www.ethicaltraveler.org/act/campaign-against-human-trafficking-in-perus-sex-tourism-industry/>.

slaves at illegal mining camps in the Madre de Dios province. A charity known as Save the Children estimates those more than 1,100 underage girls fell victim to acting as sexual slaves in these illegal mining camps.⁶² While sex trafficking makes up the majority of cases of human trafficking in Peru forced labor is another major issue.

Forced labor is the second form of human trafficking that occurs in Peru. Those who are captured or sold into forced labor are sent to work in mines, brothels, factories, or as household slaves. According to a 2005 estimate by the International Labor Organization, some 33,000 people are working as forced laborers in Peru. In fact, many of these 33,000 people are indigenous people. These indigenous people are tricked into the hands of human traffickers because they are told that they have to come work to pay off debts that they have supposedly incurred.⁶³ Many times children who are forced laborers became such because their parents could not afford to care for them. Often times parents will send their children to live with close friends or relatives whom they believe can provide the children with a better life. However, these children are sold to human traffickers for profit and are then become forced laborers. Forced labor may also occur in the form of domestic work, which usually involves non-existent salaries, conditions of poor nutrition, and imprisonment.⁶⁴ Children are also coerced to work as beggars and then obliged to turn over most of the profit that they make. One of the largest sectors of forced labor is the informal mining industry.⁶⁵ Victims of human trafficking are driven to work in the informal mining industry, which exposes them to very dangerous conditions and to being

⁶² *BBC*, "Peru Sex Slavery: Police free 300 women in the Amazon," 4 October 2011
<http://www.bbc.co.uk/news/world-latin-america-15165339?print=true>.

⁶³ Hanna Stone, "Peru's Human Traffickers Develop New Tactics," 16 February 2011, <http://insightcrime.org/insight-latest-news/item/568-perus-human-traffickers-develop-new-tactics>.

⁶⁴ *Capital Humano y Social Alternativo*, "The situation in Peru," (2010)
<http://www.chsalternativo.org/contenido.php?men=L&pad=32&hij=37&shi=61&pla=2&sal=2&id=I>.

⁶⁵ *Andean Air Mail and PERUVIAN TIMES*, "Cuzco, Madre de Dios and Arequipa lead human trafficking cases," July 5, 2011, <http://www.peruviantimes.com/05/cuzco-madre-de-dios-and-arequipa-lead-human-trafficking-cases/12931>.

overworked. Whether victims of human trafficking are sent to work in the sex trade or are forced laborers the conditions and treatment are an egregious violation of human rights.

As previously stated the United States State Department classifies Peru as a Tier 2 human trafficking country meaning that the government has made some efforts to put an end to human trafficking. One such effort is the National Plan put forth between 2007- 2013, which would increase police and government officials training with regard to human trafficking, improve the skills of immigration agents, promote the implementation of new anti- human trafficking laws, and the establishment of a telephone hotline for victims of human trafficking to call.⁶⁶ Following the implementation of an anti- trafficking law in November 2008, a dedicated anti- police trafficking unit was established. This unit increased efforts against sex trafficking crimes.⁶⁷ In January 2007, Law 28950 was passed. This law defined human trafficking and set criminal sanctions for those who were convicted to human trafficking.⁶⁸ This law increased prison sentences for those convicted of human trafficking especially when minor were involved. Since this law has been passed the police in Peru have had much success in apprehending those suspected of human trafficking and have been able to rescue hundreds of victims of human trafficking. According to an article from Peruvian Times, “Since 2004, the Peruvian national police’s office responsible for investigating human trafficking has rescued 730 people...”⁶⁹ This same article reports that as of September 2010 the Peruvian police have arrested 30 people suspected to be implicated in human trafficking.⁷⁰ In October 2011, Peruvian police raided the

⁶⁶ Lily Césodes, “Slavery in Peru,” *The Human Trafficking Project*, (2008)
<http://www.traffickingproject.org/2008/05/slavery-in-peru.html>

⁶⁷ Taft-Morales, 2009.

⁶⁸ United States Department of State, 2011.

⁶⁹ Andean Air Mail and PERUVIAN TIMES, September 2010.

⁷⁰ Ibid.

Amazon region and freed 300 women who were working as sex slaves.⁷¹ These statistics illustrate that while human trafficking remains a significant issue within Peru, Law 28950 has helped to improve the situation.

Despite all of the measures that have been taken in recent history to combat human trafficking in Peru, cases of human trafficking are often met with impunity and are rarely prosecuted. The government needs to do more work in order for human trafficking to be eradicated in Peru. Police and government officials need to continue to prosecute human traffickers so the issue will be taken more seriously. Peru must also react to international pressures to view and treat human trafficking as a human rights issue because at its very core human trafficking is an egregious violation of human rights. Not only is human trafficking a human rights issue that is relatively ignored in Peru but it is also causing a significant divide between the rich and the poor populations and the urban and rural populations because victims of human trafficking, who are often poor, are being taken from the rural areas and are being taken to the urban areas. This means that there are very low population levels in the rural areas but very high population areas in the urban areas.

⁷¹ *BBC*, "Peru Sex Slavery: Police free 300 women in the Amazon," 4 October 2011 <http://www.bbc.co.uk/news/world-latin-america-15165339?print=true>.

Water Scarcity

Political/Regional Instability

Seventy-two percent of Peru's population resides in urban areas⁷², which are located on the arid Pacific Coast. Consequently, most of Peru's agriculture is produced in this area. The problem that arises from this is the lack of water security that this region faces. Although the area is home to more than half of the population, the area only receives approximately 1.8 percent of all water available throughout Peru.⁷³ To compound the issue of water scarcity, the government has encouraged the production of water intensive crops to be used for export. As a result, Peru's agriculture exports have increased exponentially but this has caused severe water insecurity in the arid Pacific coast. It then becomes important to address two main questions. How do government policies that encourage the production of water intensive crops affect water security? What does this new issue of water insecurity mean for social and political stability within Peru?

The Ica river valley accounts for most of the high-value production of agricultural exports coming from Peru. One of the highest value crops is asparagus. It is estimated that 28,000 hectares were used for the production of asparagus in 2010.⁷⁴ It takes approximately 22,000 cubic meters of water to produce one hectare of asparagus with 11.5 tons of crop yield produced.⁷⁵ This is an extreme amount of water compared to other crops. For example, to grow

⁷² Food and Agriculture Organization of the United Nations, Country Briefs, 18 July 2011, <http://www.fao.org/countries/55528/en/per/>.

⁷³ Food and Agriculture Organization of the United Nations, 2011.

⁷⁴ Gaspar E. Nolte, "Gain Report: Peru," USDA Foreign Agriculture Service, 13 September 2010, http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Annual%20Asparagus%20Report_Lima_Peru_9-13-2010.pdf.

⁷⁵ Covering Activism and Politics in Latin America, "Water Evaporates in Peru's For-Export Crops," 16 February 2011, <http://upsidedownworld.org/main/news-briefs-archives-68/2910-water-evaporates-in-perus-for-export-crops>.

maize, only 800 cubic meters of water is needed.⁷⁶ Although asparagus and other specialty crops have the potential to yield higher profits on the market compared to agricultural commodities, they place an enormous stress on water supplies. Peru is ranked as the number one producer of fresh asparagus and the number two producer of preserved asparagus in the world next to China.⁷⁷ Currently, the water needed to produce this crop is coming from non-renewable resources or irrigated from the Peruvian Amazon. The water is essentially exported to other countries since none of the asparagus produced is for domestic consumption.

The use of non-renewable water resources is not sustainable for long-term agricultural or domestic use. Currently, the main source of irrigation for high-value export crops is the Ica aquifer and water imported from the glaciers in the mountains and other areas of the country. At the current rate of usage it is estimated that this resource could be depleted by 2013.⁷⁸ This could possibly result in social and political instability as a similar issue has occurred previously. During the 1950s, the cotton industry caused the aquifer in the Ica river valley to become depleted.⁷⁹ This led to mass protests and conflicts over access and availability of water. Water conflicts could be in Peru's near future if new irrigation technology that is more efficient needs to be developed.

Government policies that encourage trade of high profit yielding agricultural products are having a negative effect on Peru's water supply. Although the Peruvian government may consider these policies forward thinking as a way to encourage economic development they are, in fact, causing social tension. The current methods of supplying water to the region are

⁷⁶ Food and Agriculture Organization, "Crop Water Needs," 15 January 2012, <http://www.fao.org/docrep/S2022E/s2022e02.htm>.

⁷⁷ Tatsuya Shimizu, "The Expansion of Asparagus Exports in Peru," ARRIDE, 5 January 2012, http://ir.ide.go.jp/dspace/bitstream/2344/145/1/ARRIDE_Discussion_No.73_shimizu.pdf.

⁷⁸ Covering Activism and Politics in Latin America, "Water Evaporates in Peru's For-Export Crops" 16 February 2011 <http://upsidedownworld.org/main/news-briefs-archives-68/2910-water-evaporates-in-perus-for-export-crops>.

⁷⁹ Ibid.

ineffective and will eventually run out. By encouraging farmers to invest in these crops, the government is speeding the depletion of the Ica aquifer and other water resources. As this happens, less water will be available for domestic crop production and consumption. Food insecurity, mistrust of government policies, and social unrest will be the result.

Peru will need to rely more on foreign aid and food supplies to meet the dietary need of the population. Also, local farmers will struggle to produce goods for the domestic market as water supplies dwindle. Unemployment and conflict over limited water supplies can result from this as local populations begin to question the authority and legitimacy of the Peruvian government when making decisions about allocating domestic water supplies.

The irrigation technology will need to be improved and new renewable water resources will have to be utilized. Rainwater pumped from the Andes, desalinization projects and other forms of surface water may be the solution to providing water security in the future. As with the water wars that took place in the 1950s, the use of non-renewable water resources for irrigation in the Ica River valley can only lead to the same situation. Conflicts over water will lead to political instability both for local and national governments.

Mining

The mining industry within Peru has been rapidly and consistently exploding for some time, contributing to about half of the country's export revenue, however, exploration activity and future development are virtually unrestricted.⁸⁰ As mining is known for causing major environmental problems, it is imperative that the Peruvian government, along with foreign investors, takes necessary precautions to ensure that this foreign exchange and industrial growth

⁸⁰ TED Case Studies, "Peru Mining," 2011, *Trade and Environment*: <http://www1.american.edu/ted/perumine.htm>.

is sustainable and does not lead to environmental exploitation and degradation.⁸¹ Mining also causes issues of volatility due to the prevalence of illegal mining in Peru.

Because mining contributes to about 50 percent of Peru's export revenue and an estimated 50 percent of the country's peasant communities have been affected by mining, its environmental costs have become a growing source of conflict.⁸² While it is estimated that mining only uses approximately five percent of Peru's water resources, this fraction severely underscores the dangerous actuality.⁸³ There are two major issues within the mining industry in terms of its impact on water resources. First, oftentimes mine sites are located in headwater areas of the Andes, and second, mining can contaminate water quality.⁸⁴ In the first case, is significant because mining tends to deplete water sources, known as an "upstream" impact.⁸⁵ This means that water courses will be exhausted at their source, preventing many downstream communities from accessing water that is essential to their daily lives.

In the second case, the contamination of water resources is known as a "downstream" impact.⁸⁶ This means that if a water source is contaminated in a headwater area the effects can extend well beyond the mine site as the water flows or is transported to many different communities.⁸⁷ There are three major ways in which mining tends to contaminate water sources. The first, Acid Mine Drainage is one of the most prominent impacts that mining has had on water sources in Peru. This is the transmission of contaminants released during the mining process through the movement of water. The contaminants from the process result from breaking

⁸¹ Ibid.

⁸² Anthony Bebbington and Mark Williams, "Water and Mining Conflicts in Peru." *Mountain Research and Development* 28, no. 3/4 (2008).

⁸³ Ibid.

⁸⁴ Ibid.

⁸⁵ Jessica Budds, "New Research on Water and Mining in the Peruvian Andes at the Open University," *The Peru Support Group*, July 2010.

⁸⁶ Ibid

⁸⁷ Anthony Bebbington and Mark Williams, 2008.

rocks to gain access to the ore. The unused rock is then deposited elsewhere on the mine site, exposed to air, and creating the chemical reactions, which release the contaminants.⁸⁸ The second major way in which mining tends to contaminate water sources is what is known as heavy metal contamination. This type of contamination occurs when the metals, which are being mined such as copper, lead, and silver, come into contact with water sources.⁸⁹ The third way that water sources are typically contaminated through mining is called processing chemicals pollution. During the process of excavation, chemical agents such as cyanide and mercury are frequently used to separate the desired mineral from the ore. This type of contamination occurs when such chemical agents spill or leak into water sources.⁹⁰

The third type of contamination, processing chemicals pollution, is particularly dangerous. This is because of the grave health impacts these processing chemicals have on humans. Cyanide and mercury are two of the most dangerous and most commonly used processing chemicals. There are roughly 100,000 miners that use cyanide and mercury.⁹¹ Mines throughout Peru release roughly 100 tons of mercury annually.⁹² Heavy metal contamination of water sources, particularly that of copper contamination, also has severe health effects.

As a result of the rapid usage and contamination of already-scarce water, mining has been and will likely continue to be a major source of conflict among Peruvians. A particularly telling conflict occurred over the course of five years between 1998 and 2003 between the residents of

⁸⁸ Ibid

⁸⁹ "Mining and Water Pollution," Safe Drinking Water Foundation, accessed November 26, 2011, <http://www.safewater.org/PDFS/resourcesknowthefacts/Mining+and+Water+Pollution.pdf>.

⁹⁰ "Mining and Water Pollution," Safe Drinking Water Foundation, 26 November 2011.

⁹¹ Paula Alvarado, "Water Contamination in Mining," *Tree Hugger*, 2 June 2008, <http://www.treehugger.com/corporate-responsibility/water-contamination-and-mining-biggest-challenges-for-new-peruvian-environmental-ministry.html>.

⁹² "Peru Mine Threat to Water Supply," *BBC News*, 22 November 2004.

Tambogrande and a mining company. The vast majority of residents consistently voted against the mining industry in their community, due to concern over the mine's effects in water quality and quantity, but the government and mining company refused to comply. This conflict and a number of protests eventually led to the death of two farmers and a loss of trust in national and local institutions.⁹³

In order for mining to be a successful source of necessary income for Peru, the government and its foreign investors must create and enforce a series of rules, regulations, and norms to protect water quality and quantity for Peruvian residents. Without this, mining has the inevitable potential to cause citizen dissatisfaction and distrust in government institutions, violent conflicts, and in turn, political instability.

Aside from mining's environmental costs, it also poses a criminal threat to Peru. As the mining industry rapidly expands, so do the prices of precious metals on the international market and with that comes an increase in illegal mining. Illegal mining generates roughly 1 billion dollars of income annually. The largest proportion of revenue comes from gold production, but copper and silver are also produced.⁹⁴ The most significant impact that illegal mining has is its unregulated environmental degradation. Because it is illegal, the government is unable to regulate the industry which means that not only are more water sources being depleted more rapidly, but also occurring more rapidly is deforestation, the depletion of natural resources, and soil degradation.

⁹³ Anthony Bebbington and Mark Williams, 2008.

⁹⁴ Andean Airmail and Peruvian Times, "Illegal Miners," *Peruvian Times*, October 28, 2011, <http://www.peruviantimes.com/28/snmpe-illegal-miners-generate-1-billion-per-year/14115/>.

Rising metal prices have motivated criminal investment and even “gangland ownership” around these natural resources.⁹⁵ This is particularly worrisome because with illegal mining often comes other problems such as human trafficking, child exploitation, and criminality.⁹⁶ Illegal mining activities also leave behind destruction of forests, contamination of water sources, and depletion of resources and soil.⁹⁷

The illegal mining industry in Peru has the potential to create a serious perception of high crime rates and to instill insecurity in citizens. This could ultimately create great instability for the Peruvian government if measures are not taken to put an end to the illegal industry and the crime that goes along with it.

Privatization

Privatization is the transfer of government-controlled companies to private ownership. Privatization on a global scale receives mixed feelings and concerns; for instance, privatization is particularly controversial in Peru. “If privatization has become a dirty word in Peru, it is less because of ideology than practicality.”⁹⁸ Based upon unpractical payments, not helping their country economically, and limited availability of the privatized resource, privatization to most Peruvians is seen as corrupt and without benefits. There have been numerous privatization cases with utility companies, fisheries, telephone companies, mines, ports, and water distribution. With water being sparse and a necessity of life, water privatization is of the upmost concern. Small local farmers especially fear the rise of water prices; they fear their access to water would be

⁹⁵ Stuart, "Illegal Gold Mining Activities in Peru and Colombia Spur Mercury Contamination," *Metal Miner*, March 8, 2011, <http://agmetalmminer.com/2011/03/08/illegal-gold-mining-activities-in-peru-and-colombia-spur-mercury-contamination/>.

⁹⁶ "Peru Mine Threat to Water Supply," *BBC News*, November 22, 2004.

⁹⁷ Andean Airmail and Peruvian Times, "Illegal Miners," *Peruvian Times*, 28 October 2011.

⁹⁸ Barbara J Fraser, "PERU: HANGING UP ON THE PUBLIC SECTOR." *NACLA Report On The Americas* 36, no. 3: 40, 2003, *Academic Search Premier*, EBSCOhost.

reduced, but would be increased to larger, corporate growers. Such water control could eventually lead to the privatization of larger public agencies.⁹⁹ Consequently, Peruvians have displayed their concerns using many forms of protests since the 1990s. These protests range from riots in cities, to farmers blockading roads and trains to such popular tourist destinations as Machu Picchu with tree trunks, truck tires, and boulders. President Alejandro Toledo stated, “What people object to is the abuse and the arrogance of some of these companies.” The companies are not considerate of how their actions affect families.

The Peruvian government sees privatization as a way to complete its infrastructure, a way to stimulate the economy, and as a financial gain with monetary incentives and loan agreements from banks. Economist Ismael Muñoz states, “I don’t think there’s any doubt that it was necessary to privatize most of the state-run businesses, not only because they were operating at a loss, but because in many cases it didn’t make sense for the government to be running them.” More importantly, the financial cost of privatization is high. There have been decades of unregulated dumping of mine waste, which resulted in the Andes being littered and water pollution; however, no one wants to take responsibility for this. Though the government argues that privatization stimulates the economy, Peruvians believe that privatization does nothing to benefit employment. “Privatization did nothing for local employment – or worse yet, had a negative effect. Of the 3,456 employees of the state-run fishing company Pesca Perú, only 172 are still working in fisheries.”¹⁰⁰ This trend can be seen in other instances, a Chinese Mining Company promised to invest \$150 million after its undervalued purchase of the mine. The money never materialized and the work force dissipated from 4,800 in 1992 to 1,300 in 2003.

⁹⁹ M. Louisa, Peruvian farmers block roads to protest water laws Reuters. *Business & Financial News, Breaking US & International News Reuters.com*. 15 January 2011, <http://www.reuters.com/article/2009/01/15/idUSN15538401>.

¹⁰⁰ Fraser, 2003.

Even more alarming, the city's population on the southern coast of Peru declined from 22,000 to 12,900 over the past decade.¹⁰¹

As of now, the Peruvian government does not have the funds to properly reform its water systems. To account for this lack of capital, the Inter-American Development Bank and the Peruvian government are attempting to resolve this by privatizing water. There is a loan agreement with the Inter-American Development Bank; however, which includes water privatization for the country. The management of water is a hotly debated controversy because of many factors such as a requirement for life, a limited resource, as well as considered a natural human right:

“Water is necessary for every part of our lives, and access to water is therefore a fundamental human right. We are convinced that the government's job should be to protect that access, not to put this precious resource into the hands of private companies whose bottom line is their own profits.”¹⁰²

FENTAP (Federacion de Trabajadores del Agua Potable Y Alcantarillado Del Peru) was once a local union of workers at water facilities and communities who were against water privatization. The government had disbanded the union's license in 2006 as a result of companies discriminating against FENTAP union members. Regardless, FENTAP's previous members are still actively fighting for human water rights, challenging water utility companies, and inspiring Peruvians.¹⁰³ FENTAP had two guidelines: first, water workers themselves do not have power to stop privatization, and second, they do not want to defend the status quo. They stated that 1.5

¹⁰¹ Ibid. 41.

¹⁰² Luis Issara and Lisa Donner, "The Fight for Public Water in Peru." *Social Policy* 35, no. 2:13 (2004), *Academic Search Premier*, EBSCOhost.

¹⁰³ Federation of Unions of Water Workers of Peru (FENTAP) Unitarian Universalist Service Committee." Unitarian Universalist Service Committee. http://www.uusc.org/program_partners/FENTAP (accessed December 1, 2011).

million of Lima's 7 million residents do not have either tap water or a connection to running water. Unfortunately, these same conditions are a problem for 30% of the entire country as well. In 2004, the local union of Pacasmayo, Department of La Libertad, located in northwestern Peru, was successful with returning water to the public sector.

“The private contractor – Norwasser – abandoned the project after a 2 year campaign. 43% of people in LA Libertad do not have access to running water, and under Norwasser's management things only got worse, with problems including raw sewage overflowing into irrigation ditches, and water service to many households restricted to only 3 to 5 hours a day.”¹⁰⁴

This had been a success for FENTAP, however, there was PROINVERSION, which is a pro-privatization state agency that promotes increased mobilization and efforts. Issara and Donner stated that PROINVERSION, “makes promises that they cannot keep about benefits that concession will bring, and aggressively promoting the notion that privatization is simply the only form of ‘modernization’.”¹⁰⁵ The water and sanitation workers of Peru have a harder time exposing their stories, because radio stations and reporters, who at one time agreed to expose FENTAP news, now, have been paid by local elected officials who support privatization. As a result, they refused to air FENTAP news without additional payment. This is a significant case of how the government deals with groups with agendas that disagree with their own.

Peru's next-door neighbor, Bolivia, has also faced controversial water privatization resulting from Bechtel receiving international recognition. “World Bank officials told Bolivia's president that \$600 million in debt relief was dependent on putting Cochabamba's water system into private hands.”¹⁰⁶ Bechtel's water prices increased by 200%; unsurprisingly, Bolivian families could not keep up. Living off \$60 a month and paying as much as \$15 for water is unreasonable.

¹⁰⁴ Issara and Donner, 2004.

¹⁰⁵ Ibid., 14.

¹⁰⁶ Jim Shultz, "BOLIVIA: THE WATER WAR WIDENS." *NACLA Report On The Americas* 36, no. 3: 35 (2003), *Academic Search Premier*, EBSCOhost (accessed October 31, 2011).

Although Bechtel's website states that the state of water in Cochabamba was unsanitary and not regulated by the government *tanqueros*, or water trucks, would monopolize water distribution and deliver water to poor families with high prices. Thus, the government sought to create a bulk transport system into the city. However, with Bechtel's prices, many protests ensued, resulting in injuries and deaths. In the end, the government stopped protecting Bechtel and asked Bechtel to leave. A new contract of public water was carried out. However, Bechtel filed a \$25 million legal suit against Bolivia, which would be significantly detrimental to Bolivia. Many countries petitioned to hear this court and participate in it, and Bechtel eventually won out. Despite this court decision, a university student stated, "Many people say it is impossible to fight against the neoliberal models. But we showed that you can, not just in Bolivia but in the world. The humble people are the majority and are more powerful than multinational corporations."¹⁰⁷

Overall, water privatization remains controversial and the strong majority of Peruvians desire public water. There have been numerous cases of privatization failures, especially for water. Elected officials favor privatization because of monetary gains and belief that it will reform water and sanitation. With water becoming the new liquid gold, it is concerning what people will do for public water rights.

¹⁰⁷ Ibid., 37.

Energy

The Grid – Current and future issues

In order to protect Peru's energy production both current and future vulnerabilities to the system must be addressed. The Peruvian Ministry of Energy and Mines ranks terrorism, seismic activity and strike/civil commotion among the highest current risks to the electrical grid. Other risks addressed in the Ministry's Civil Defense Plan include other natural disasters including fire and flood as well as assault, sabotage and invasion. While many of these issues are blanketed by a larger topic (natural disasters encompasses seismic activity, flood and fire) the first three topics will be addressed.

Terrorism was recently a huge topic in Peru when on December 7th 2011 the rebel leader of the terrorist organization the Shining Path admitted that the rebel movement had been defeated. Comrade Artemio, who took leadership of the movement when the group's founder Abimael Guzman was arrested in 1992, decided to open negotiations with the government to end their rebel reign. The Shining Path killed an estimated 70,000 people at the height of their power in the late 1980s and early 1990s. While the group never specifically targeted the electrical grid it is large rebel movement like the Shining Path that holds the power to damage the electrical grid and therefore weaken the government.¹⁰⁸

Peru's geographic location makes it an area highly susceptible to the changing climate. With most of the population inhabiting the coastal regions they are susceptible to the changes in oceanic currents, such as the El Nino current, also flooding during storm season. Their location on the edge of the circum-Pacific seismic belt means that they are at greater risk for

¹⁰⁸ BBC, "Peru's Shining Path defeated, rebel leader admits," 7 December 2011, *BBC News*
<http://www.bbc.co.uk/news/world-latin-america-16066029>

earthquakes.¹⁰⁹ The latest large earthquake to shake the region occurred in late October 2011. While the 6.9 magnitude earthquake did not claim any lives the damage was great. If an earthquake were to affect the electrical grid of a central city such as Lima the damage could influence the government.¹¹⁰

While not as dominant as the previous issues, energy strikes in Peru have occurred. In June of 2010 Peruvians set out to disrupt transportation systems through peaceful protest. The focus of these protests was that Peru was to export liquid-natural gas to foreign countries while they could not meet current domestic demand. While the civil commotion took place in a peaceful manner, in fact the strikes were announced ahead of time in order to encourage government negotiations, not all strikes are guaranteed that level of civility.

While Peru needs to address current vulnerabilities in their system they must also address future vulnerabilities to the system. These future vulnerabilities include socioeconomic divide, civil unrest, climate change and increased demand.

The Socioeconomic divide in Peru is already quite visible, even based upon electricity. The wealthy, usually those in the urban areas, have constant electricity while those in the more rural areas are lucky to receive any electricity at all. Though this divide is apparent Peru has done little to provide the rural regions, where placing electrical lines is next to impossible, with some form of electricity. In late 2011 Peru's poor received assistance from the European Union (EU). Through the aid program with the EU 130 rural communities in Peru are provided forms of clean energy production including solar panels, and wind generators. Without the aid of the EU it is

¹⁰⁹ U.S. Geological Survey Earthquake Hazards Program, "Earthquakes in Peru," *Earthquake Information Bulletin*: September-October 1970, <http://earthquake.usgs.gov/earthquakes/world/peru/history.php>

¹¹⁰ CNN "Intense earthquake rattles southwestern Peru," 29 October 2011, <http://www.cnn.com/2011/10/28/world/americas/peru-earthquake/index.html?iref=allsearch>.

uncertain whether Peru's poor would receive assistance and as is only a part of the rural communities have received aid.¹¹¹

While it is clear the strike and civil unrest have occurred before over energy and have proceeded in a peaceful manner future energy restriction may cause greater unrest. In 2012 an energy ration will begin in Northern Peru due to the lack of transmission capacity to areas around the Yanacocha Gold Mine.¹¹² Besides the fact that the mine itself fuels controversy over how it affects the area the energy rationing that will take place will do little to appease the people.¹¹³

Climate change is global issue right now and will only further impact the world, and it is clear the Peru will not remain unaffected. Glacial run-off is one of the largest issues affected by climate change in Peru, not only does this increased run-off affect the water supply, as they have not found a way to store the water, it also affects the hydroelectric dams all over the country. While climate change is currently influencing the water supply Peru must also look toward the damage that can be done with changing currents, increased storm systems, longer dry seasons, and perhaps increased volcanism.¹¹⁴

While Peru is opening its borders to energy negotiations with foreign nations they need to be prepared for increased demand. In order to meet with domestic demand Peru will need to double its energy production in the next decade; this does not take into account possible foreign demand. With the threat of strike and the current and future restrictions that will be put into place Peru needs to focus on boosting their production capacity before a failure to provide results in civil unrest or foreign disputes.

¹¹¹ Mattia Cabitza, "Rural Peru gets connected," *The Guardian*, 28 November 2011, <http://www.guardian.co.uk/global-development/poverty-matters/2011/nov/28/rural-peru-gets-internet-access?newsfeed=true>.

¹¹² Patricia Valez and Terry Wade, "Peru government to ration energy in the north," *Reuters*, 2 August 2011, <http://www.reuters.com/article/2011/08/03/peru-energy-idUSN1E77128M20110803>.

¹¹³ Hannah Hennessee, "Gold mine sparks battle in Peru," *BBC News*, June 1, 2005, <http://news.bbc.co.uk/2/hi/business/4600009.stm>

¹¹⁴ U.S. Geological Survey Earthquake Hazards Program, 1970.

The Grid – Distribution and Generation

The energy production within Peru has seen many challenges and new positive impacts that will hopefully allow for expansion throughout the country and into neighboring countries. Currently, the energy production can be divided into two major contributors: fossil fuel plants (thermal plants) and hydroelectric plants.¹¹⁵ Fossil fuels have been shown to provide 56 percent of the power generated, while hydroelectric plants are currently providing 44 percent.¹¹⁶ With energy production being established through two different styles of plants the installed capacity is 7,059 MW.¹¹⁷

Even with several thousand megawatts being produced throughout the country, about a quarter of the population has no electricity.¹¹⁸ The majority of the individuals without electricity live in the rural areas, mainly within the Andes mountain range and the Amazon rainforest, both of which occupy over half of the country.¹¹⁹ It is estimated that of the 6.5 million people without electricity 5.3 million people, over three-fourths, will be eventually reached by the grid.¹²⁰ The remaining 1.2 million will only be able to be reached through renewable energy sources, because of the cost of expanding the grid to isolated regions.¹²¹

There are several projects that are currently being conducted that have allowed for the electrification of unreachable areas. Practical Action, a non-profit group, currently working in Peru has brought energy to over 20,000 people just within 2010. The group is hoping to be able

¹¹⁵ Energypedia “Peru Country Situation,” last modified 9 December 2011, https://energypedia.info/index.php/Peru_Country_Situation.

¹¹⁶ Ibid

¹¹⁷ “Rural Electrification In Peru,” Sixth Framework Programme, 29 December 2011, www.tech4cdm.com/uploads/documentos/documentos_Rural_Electrification_In_Peru_db7943a3.pdf

¹¹⁸ “Practical Action Peru: Bringing Electricity To Rural Peru Through Small-Scale Hydropower Technology,” last accessed on December 29, 2011, energymap-scu.org/practical-action-peru/

¹¹⁹ Ibid

¹²⁰ Ibid

¹²¹ Ibid

to expand by four to five hydroplants each year.¹²² The government has also been looking into renewable sources that will allow for the largest amount of energy to be produced and have little impact on the environment.¹²³ The idea is to be able to develop “photovoltaic components, small wind turbines, towers, hydroelectric turbines, inverters, power controllers, isolated photovoltaic systems, software, solar and wind powered water pumps, water storage tanks, batteries support structures, etc.”¹²⁴ There are two factors that will affect which type of renewable energy source is the most effective: the location of the people and the number of individuals that must be covered by the source.

Currently many individuals living in the rural population, who have no electricity, are dependent upon local resources. It has been discovered that the primary source for energy in these areas is biomass.¹²⁵ Biomass is a fuel that is composed of organic matter: wood, grass, etc.¹²⁶ The major use for biomass is to provide a source of energy for cooking. There are also many individuals that rely on off-grid electricity sources, which is often a car battery.¹²⁷ The majority of the energy produced by car batteries, however, is not to power lights, but instead to power appliances: refrigerators, microwaves, televisions, etc.¹²⁸

The electrification rate in rural areas is low, adding to this, the rate for the entire country is only 78.7 percent.¹²⁹ The rate for the regions differs, however, just like they do with urban areas and rural areas. The energy consumption is higher in cities and urban areas, especially

¹²² Ibid

¹²³ Ibid

¹²⁴ Ibid

¹²⁵ Energypedia, 2011

¹²⁶ Biomass Centre “What is BIOMASS?,” *Biomass Energy Centre*, 8 January 2012, www.biomassenergycentre.org.uk/portal/page?_pageid=76,15049&_dad=portal

¹²⁷ “Peru Country Situation,” 9 December 2011, https://energypedia.info/index.php/Peru_Country_Situation

¹²⁸ Ibid

¹²⁹ Ibid

along the coast.¹³⁰ Currently the National Electrical System covers 80 percent of the land area of Peru.¹³¹ Yet, of the land area that is covered by the grid, the coastal central and southern regions of the country have the highest electrification rates: 60 percent and 71 percent.¹³² This is due to the more densely populated areas and its ability to be more accessible by the grid.¹³³ The lowest rural electrification rate occurs in the Andean north and the Amazon regions, having a rate of only 22 percent and 18 percent overall.¹³⁴

The low electrification rate in the country is not the only problem for Peru. The major problems that are occurring to the grid, currently, are outages due to network management and capacity or the lack of it and the losses of energy.¹³⁵ There is little that can be done for electricity losses. No matter what country you are in, there is always going to be an amount of energy that is lost throughout the system. However, the network management can be improved.

As of 2008, 14 companies generated electricity for the Peruvian market.¹³⁶ Yet, of the fourteen companies, four of the companies accounted for 72.5% of the total capacity that was being produced.¹³⁷ These companies are EDEGEL, Electroperu, Energia del Sur, and EGENOR.¹³⁸ The two major companies of this list is EDEGEL and Electroperu, which together produce over 2,500 MW.¹³⁹ Even though the energy is being produced from four companies, each of them produce the energy in different ways. EDEGEL produces their 1,574 MW through

¹³⁰ Ibid

¹³¹ "Rural Electrification In Peru," Sixth Framework Programme, 29 December 2011, www.tech4cdm.com/uploads/documentos/documentos_Rural_Electrification_In_Peru_db7943a3.pdf

¹³² "Peru Country Situation," last modified 9 December 2011, https://energypedia.info/index.php/Peru_Country_Situation.

¹³³ Ibid

¹³⁴ Ibid

¹³⁵ Ibid

¹³⁶ Ibid

¹³⁷ Ibid

¹³⁸ Ibid

¹³⁹ Ibid

thermal generation, while Electroperu produces their 1,032 MW through hydroelectric production.¹⁴⁰

The production of energy has not only been limited to the companies that are now controlling the grid. In the past couple of years projects have been developed to not only increase the electrification rate in rural areas, but also to increase the energy production throughout the country and into neighboring countries. The most well known project currently happening in Peru is the Camisea natural gas project.¹⁴¹ The project was established in August 2004 and has been able to reduce the country's dependence on diesel and power rationing, which occurs during harsh times.¹⁴² The Inter-American Development Bank (IDB) estimates that the project is going to be able to provide Peru with an estimated \$23 billion in benefits over the 33-year lifespan.¹⁴³ Since the installment of the project in 2004, the cheaper natural gas has offset the imports of more expensive fuels and the domestic consumption has continued to rise; increasing by more than a six fold from 2003 to 2008.¹⁴⁴

There are two other projects that the Peruvian government has established: the LNG project and the damming of the Amazon River. The liquid natural gas project was established in June of 2010 and is currently the largest investment that the government has made to date.¹⁴⁵ The project has allowed for the export of materials to Mexico and other countries and has converted Peru into a net energy exporter.¹⁴⁶

¹⁴⁰ Ibid

¹⁴¹ US State Department "Background Note: Peru," *Bureau of Western Hemisphere Affairs*, 9 November 2011, www.state.gov/r/pa/ei/bgn/35762.htm

¹⁴² Ibid

¹⁴³ Nicole Spencer, "Energy in Peru: Opportunities and Challenges," *Americas Society and Council of the Americas*, 2010, www.as-coa.org/files/ASCOA_Energy_in_Peru.pdf

¹⁴⁴ Ibid

¹⁴⁵ US State Department, 2011.

¹⁴⁶ Ibid

The damming of the Amazon River has been a debate for awhile. It is believed that with the damming, the hydroelectric power will produce 8 times the energy that the country is already produced throughout the country.¹⁴⁷ It is also hoped that if the damming is ever approved, Peru would be able to export some of the energy to both Brazil and Chile.¹⁴⁸ The Peruvian government recently has stopped the establishment of hydroelectric plants. This is due to the fact that the damming will destroy unique environments and ecosystems and displace hundreds of people, mainly indigenous tribes.¹⁴⁹

Indigenous Concerns

Peru faces many challenges in its energy sector. The conflicting issues in grid distribution in the large country, where power is concentrated on the coastal city of Lima are central to present and future concerns. With a high percentage of Peru's population living in rural areas, but the highest centers for power rooted in the largest city in the country there is a serious and severe disconnect between the policy makers and those affected by the decisions made. In all sectors, but especially the energy sector, this is a serious problem given the difficult geography of Peru. The coastal area that is the minority of the territory holds both power and wealth, but it is in the mountainous and jungle regions where the true potential wealth of the country abounds. These areas, the ancestral homes of indigenous peoples who have made their living in isolated pockets, are the sources of interest to foreign companies who hold little regard for the natives.

Peru has great reserves of mineral wealth and is a potential powerhouse in renewable energies. These attract foreign interest seeking to take advantage of the economic returns that could become available once a certain investment is established in the country. The largest issue

¹⁴⁷ Economist "Peru's energy ambitions – Hydro-powered dreams: Hopes and fears of a regional energy hub," *The Economist*, 10 February 2011, www.economist.com/node/18114659

¹⁴⁸ Ibid

¹⁴⁹ Ibid

with the current situation is that the locations with the highest available sources of potential development and economic return are already inhabited. As Milagros Salazar noted in an IPS article on October 10th 2006, census data from 1993 put the indigenous population at around 9 million, the majority of these living in the highlands area; the greater majority of them being Quechua, less than 10 percent being recognized as Aymara and Amazon jungle groups. Today, 50 percent of the inhabitants of Peru live along the coast, roughly 40 percent live in the highlands, and approximately 10 percent live in the jungle region.¹⁵⁰ Roughly half the population of the country are facing displacement and they will receive little, if any, return for the lands that are used by foreign investment.

“One illustrative case is that of the Achuar people on the Corrientes River in the country's northern jungle region of Loreto, where the oil industry has been causing damages to the water, flora and fauna for over 30 years. The California-based Occidental Petroleum has been operating in that area since the 1970s, and Pluspetrol Norte, a local subsidiary of Argentine-based Pluspetrol, is also currently active there. According to the report, over 50 percent of the 8,000 indigenous people who live in that region have been affected by the activities of oil companies. It cites a Health Ministry study published in May that confirms that cadmium and lead above acceptable limits were found in the bloodstreams of local residents, especially children. Petroleum residues in the waste water dumped into the rivers can lead to the destruction of algae and microorganisms that serve

150 National Encyclopedia, “Peru. Country Overview,” *National Encyclopedia*, <http://www.nationsencyclopedia.com/economies/Americas/Peru.html>

as food for fish, states the alternative report.”¹⁵¹

As technology advances into Peru through foreign investments, civil unrest in the country becomes a serious and predominant issue. Companies invest money into the country, pushing booming economic advances throughout Peru. These companies expect and are often promised by the government of Peru returns on their investment. The planned return affects these people, the natives and indigenous peoples of Peru, who had little or no part in the decision making process, and will get little recompense for the damage and effects on their livelihood and home. As corporations plant their roots into the bedrock of Peruvian soil, the natives are forced to either flee or rise up in protest. As seen in news articles such as the BBC reported “Peru protests at huge Conga gold mine in Cajamarca”¹⁵² the latter choice is favored. These disruptions affect and influence future and current foreign interest and serve to destabilize the country.

Inevitable change will occur in Peru. It is debatable who will receive the best kind of change. Peruvian politicians seeking to ingratiate themselves or appease the indigenous people, a shift in government interest towards renewable energies, a concerted effort to take into account the perspective of those outside the higher areas of power in government are clear indicators of change. They may point to further plans for development, or even a concentrated lobby by foreign interests to allow more access and freedom within the country. There are many sides to the issues in Peru, and the potential outcomes are both numerous and diverse. But the eventual outcome of the current situation will be resolved in some form or another when the Peruvian government comes to an understanding with the people who have the most to lose; the

151 “Indigenous People, Ignored Even by the Statistics,” IPS, <http://ipsnews.net/news.asp?idnews=35058>
152 BBC News – Latin America & Caribbean, “Peru protests at huge Conga gold mine in Cajamarca,” 24 November 2011 <http://www.bbc.co.uk/news/world-latin-america-15884119>

indigenous people who have the last say. Until that time, Peru remains in a state of unrest that disrupts current and future plans on all fronts.

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