

*Learning Sustainable Development:  
Chimeneas de la Esperanza*

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*Learning Sustainable Development  
Chimeneas de la Esperanza*

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Oct. 8<sup>th</sup>, 2009

### **Research Proposal**

In a village near Granada, Nicaragua there is a ceramics kiln that has been built for a nonprofit organization, yet it is not being used. Judit Targarona, an officer and supporter of La Asociación ‘Casas de la Esperanza’ (ACE), wants to put the kiln to work and establish a pottery business for the community. To help achieve this goal, I and two other Cal Poly students; Tiffany Nickels, a Psychology major, and Kyle Giacomini, a Forestry major, are going to work on developing a suitable business model. This project is done under the guidance of Dr. Pete Schwarz, Cal Poly Physics Department, and Andy Kreamer, of UC Berkeley, as a class project in *Appropriate Technologies for the World’s People: Development (UNIV 391)*. The goal of this project is to overcome some of the difficulties of bringing a plan for development into a rural Third World environment.

It is an objective that this project is a sustainable contribution to the developing world. Therefore, it is important to consider the effect that projects like this can have on the local and global community. The increasing interconnectedness of the world through globalization, the depletion of natural resources, as well as world-wide environmental crisis, make it crucial to consider carefully the impact of any action, no matter how small. To make sure that this project and the organization which it is associated with is beneficial, it is essential to try and evaluate every possible impact. The pottery business should be designed with cultural and environmental balance in mind, to ensure smooth integration, environmental conservation and economic success for the future.

Many aid projects planned by westerners then attempted in less developed countries do not succeed; therefore, it is important to investigate prior projects in the area, study the cultural and political history, evaluate the current environment, and have a local connection. Whatever the outcome of a previous venture, there is always something to learn. Case studies of similar projects will be used to gain insight from others’ experiences. Furthermore, extensive historical, political and cultural library research will be conducted for the development of the plan and sustainability of the ceramics business. Also, the project is based in La Asociación ‘Casas de la Esperanza’ (ACE), a non-denominational, non-political NGO. (ACE “develops housing, and provides technical

education to families who are currently squatters, living on the outskirts of Granada, Nicaragua” (<http://www.casas-de-la-esperanza.org/>.) The focus group will be able to contact this organization via email for local insight and site details as well. Knowing the situation at hand thoroughly will strengthen the proposal and give this project a greater chance of success. This project, like almost any other venture, needs funding; therefore, the group will write a grant proposal in hope that someone with funds also sees the project’s potential. The project may also be continued in another section of the class with a concentration on product design during winter quarter 2010.

The senior project portion will consist of a 25 page minimum paper reporting on the experience of participating in and analyzing the impact of the class project. The paper will also include a research portion, exploring the benefits and challenges of introducing appropriate technology for development in third world nations, particularly Nicaragua.

Through the hard work of many, this development project, as well as others like it, will continue the effort of helping those that are struggling in poverty. Hopefully by participating in community-based projects such as this, Nicaraguan families will be able to make a good living through ceramic craftsmanship. This model also serves to stimulate the cooperation of diverse communities, and by example aims to inspire future endeavors of the like. The experience and documentations of such efforts, this case in the form of a senior project paper, is also valuable as information that may be built upon and used to avoid repeated mistakes, becoming a little contribution to accumulated knowledge on the subject.

Oct. 29, 2009

### **Annotated Bibliography**

Allan Savory, "Succession." *Holistic Resource Management*. Island Press (1988). 73-89.

In development projects the goal is to make a change. That change depends on altering aspects of a complex preexisting environment (i.e. the community and ecosystem of the project location). No matter what the intended purpose of a project, there are usually unintended effects as a result of the change in the system. This chapter brings attention to the fact that people are part of a dynamic natural system that has structure and laws of its own, apart from the laws that we apply to it. Sometimes things interact in ways that we are unaware of. When we change one part of a system and get a whole bunch of unanticipated effects, these hidden connections are called attention to. We can use these ideas of how nature works to establish man made systems that are more stable and beneficial. Viewing the world as an interconnected web can help us better anticipate and mediate consequences of our actions.

"Succession is the name given to the process of change and development in communities of living organisms" (73). There are natural fluctuations and interconnected systems that one sometimes fails to see. One element builds on another, which allows systems to emerge; finally there is a huge inter-tangled web of life with hundreds of strings that connect many aspects of a community together. Simple systems are less stable and can fluctuate greatly dependent on small differences of inputs, more complex systems have established feedback cycles that make each part of the system interdependent, which promotes stability and equality. Therefore it can be beneficial to build on existing systems when promoting change, as with new development projects. This idea also encourages research into the specific development location at various levels of interaction.

Clawson, David L. *Latin America and the Caribbean: Lands and Peoples*. 4th Edition. New York: McGraw Hill (2006).

This source provides basic information on the physical geography and history of the region. This information is important in understanding how systems work together and how that environment evolved. The focus of the senior project paper is based in La Prusia, Nicaragua, which is located near Granada in the western region of the Central American Nation. So, this text will provide background information into the current situation of this location.

The Central American Volcanic Axis passes through Nicaragua, and there are many active volcanoes creating very fertile volcanic soil. The country is also home to Central America's largest freshwater lakes, Lake Managua and Lake Nicaragua. "Nicaragua's lowlands historically have supported one of Central America's densest populations. Its potential to become one of Latin America's most prosperous regions has never been realized, however, owing in part to the nation's turbulent political history and repeated devastation from earthquakes, volcanic eruptions, and hurricanes" (40). The

climate of Western Nicaragua is tropical savanna, which is wet in the summer and dry in the winter, and the East is tropical rainforest. There are also other variations between Eastern and Western Nicaragua. War and conflict has been continuous throughout the nations history. There is "deep cultural differences between the Mosquitia, the mixed Indian and black Caribbean costal plains region" (125). The British colonized the Eastern region, and the Spanish occupied the West. The Spanish also fought amongst themselves; the conservative interior agricultural city of Granada versus the liberal Leon on the Pacific coast. The capital eventually became Managua, which is in between the two. In 1979, a leftist group called the Sandinistas built up the military and discouraged private enterprise with the assistance of the USSR. The United States supported a counter movement that was a devastating failure. "The nation remains intensively divided" (125). On the other hand, there are also many characteristics that unite the people and make Nicaragua a continuous part of Latin America, a distinct cultural region.

Corbett, Sara. "Solution in a Pot." *New York Magazine*. Dec. 28, 2008. 38. ProQuest.

"Solution in a Pot" is an example of an appropriate technology that was successfully established in Nicaragua.

Ron Rivera moved to Nicaragua to help injured war veterans make insulators for electrical lines. He then got involved with Potters for Peace and helped indigenous potters refine their techniques to increase their profits and power. After Hurricane Mitch, he developed the clay pot water filter by adding sawdust to the clay mixture, which made the pots extra porous and able to turn floodwater into drinking water. Local workers are making the filters from local materials. Potters for Peace has continued to encourage the production and use of these filters throughout the world.

Ferguson, James. "Epilogue." *The Anti-Politics Machine: 'Development,' Depoliticization, and Bureaucratic Power in Lesotho*. 1990. Cambridge University Press.

The "Epilogue" of *The Anti-Politics Machine* provides a perspective of someone that has studied the effects of development through personal involvement. This is written for an intellectual audience and questions the core of what is going on in developing countries and what we can do about it.

At the end of his work, Dr. James Ferguson, Chair of Anthropology at Stanford University, reflects on what should be done. He states that there is no clear guide for action, but that there is a clear goal of empowerment. Problems will not be solved through general plans; there needs to be localized, tactical responses to specific issues. He encourages political participation in one's own society. He also believes in protecting non-governmental and counter hegemonic unions and movements. Allowing such forces to exist and encouraging their organization and networking is beneficial in empowering the people. Also, education and training in specific skills needed for tasks, that will help the people empower themselves, can be beneficial. He believes that engaging in the difficult task of empowering the poor can provide benefits, such as intellectual and

scholarly energy, and work of democratic and populist commitment that so many Anthropologists share.

“IMF’s absurd demands on Nicaragua.” The Bretton Woods Project. Sept. 22, 2009. <<http://www.brettonwoodsproject.org/art-565444>>.

This article displays some of the restriction that the International Monetary Fund has placed on Nicaragua and the response from the government. It also demonstrates the amount of control that organizations like the IMF have over government policies of the country that is receiving aid.

The IMF has received complaints from Nicaragua’s government for placing demands on their tax policies. The Bretton Woods Project reported in September of 2009 that “Nicaragua complained in July that the IMF made “absurd demands,” when they asked the government to end tax exemptions on non-profit entities.”

Iritani, Evelyn. “Tiny Loans Seen as Big Way to Invest in Developing Nations’ Poor.” Los Angeles Times. Jul. 28, 2006.

“Tiny Loans Seen as Big Way to Invest in Developing Nations’ Poor” describes the general history and benefits of microfinancing in developing nations, as well as a summary of who is involved with big micro lending programs and how much money is being invested.

Fifty dollars is enough for a woman to increase her profit enough to finally save some money and send her children to school. Bangladesh, the site of the first Grameen Bank, has had success in poverty reduction. “Microcredit providers have found that women, who receive the bulk of these small loans, are better credit risk and more likely to spend their additional earnings on their families.” The Gates foundation has started investing millions of dollars as targeted grants to help develop microlending programs around the world. Investing in poor areas can actually be profitable because the borrowers are motivated to pay loans back and the interest rates are high in some areas. These programs help people invest in themselves so that they have a stake in their own success.

Polak, Paul. “12 Steps to Practical Problem Solving.” Heifer International. Oct. 19, 2009. <<http://www.heifer.org/site/c.edJRKQNiFiG/b.3955149/>>.

This article provides a valuable guide for problem solving in different environments. “Paul Polak is co-founder and president of International Development Enterprises, a nonprofit dedicated to ending poverty by helping poor farmers invest in their own success. He is also the inventor of, among other things, the treadle pump.” He has experience solving specific problems in various developing regions.

His first step is to go to where the action is. (This seems obvious, but it is something that our project is not planning on doing.) He encourages developers to talk to

the local people and listen to what they have to say. A lot of his advice seems basic and childish, especially number five, think like a child, but this is what makes them effective. Sometimes when dealing with a new situation, we forget that another environment can have different effect on the same input. Therefore, when dealing within a unique environment, developers cannot use the same plan as in any other place.

Stein, Alfredo. “Participation and Sustainability in Social Projects: the Experience of the Local Development Programme (PRODEL) in Nicaragua.” *Environment and Urbanization*. 13(1). April, 2001. 11-35. <<http://eau.sagepub.com>>.

This is the case of a locally based group that was working in several cities in Nicaragua. Examples of past efforts provide great information on how their projects functioned and can provide beneficial models for future programs to use. This report has many meaningful suggestions.

Alfredo Stein analyzed the results of PRODEL, a local development group in Nicaragua that was financed by the Swedish International Development Cooperation Agency. The program was based in eight cities throughout Nicaragua impacted 38,000 households in the time between 1994-1998. The program distributed small grants for infrastructure and community works projects, as well as giving loans to those of low income for home improvements and micro-enterprises. The goal of the program was to increase participation of the local community and encourage continued input after the program was finished. They found that it was extremely important to keep the cost of projects down and work with existing institutions and social organizations in order to sustain the benefits of the programs after their completion. Their methods were effective and many of PRODEL’s strategies for development and poverty reduction are still being used by other organizations today.

“USAID Launches Multi-million Dollar Agricultural Project in Nicaragua.” Nov. 28, 2007. <[http://nicaragua.usaid.gov/bulletin/november07\\_2.html](http://nicaragua.usaid.gov/bulletin/november07_2.html)>.

This is an example of a project run by United States Aid organization that is currently ongoing. It is important to know who else is involved in projects, so that groups can coordinate and possibly work together. It is also interesting to see who is willing to invest in projects on location and what sort of projects they are doing there.

In 2007, USAID was able to start a project of \$30 million to improve the technology and infrastructure of Nicaragua’s agricultural industry. In association with Catholic Relief Services, Lutheran World Relief, International Center for Tropical Agriculture and others, USAID has developed a program to improve infrastructure and increase access to local, regional and international markets. They have plans of building a commercialization center in Sebaco that will increase coffee packaging efficiency, a root and tuber production facility in Jinotega, a biofertilizer plant in Turma La Dalia, and several other similar facilities on the Caribbean coast of Nicaragua. Packaging plants and production facilities near the coast will make it easier to export agricultural goods via

shipping. They also plan to increase access to irrigation water by increasing the local infrastructure through a series of mini-dams, rainwater catches and irrigation canals.

World Bank, Document of the. "Implementation Completion and Results Report."  
No. ICR0000526. (Public Disclosure Authorized). Sept. 27, 2007.

This report describes a past development project in Nicaragua by the World Bank, and may help by providing information on what is effective and what doesn't work as well. It also contains history of foreign aid in the region that might have influenced the peoples' attitude towards international development projects.

There is little infrastructure in Nicaragua, and what exists is of poor quality. Poverty in Nicaragua is also a huge problem. The World Bank has aided Nicaragua in a "Poverty Reduction and Local Development Project" to help lessen the impact of these issues. This project is aimed at improving the quality of Nicaragua's infrastructure and increasing access to education. The project is also designed to increase the coordination among the central and local government and increase participation of local communities to develop a "social safety net." The Japanese Social Development Fund helped finance the loan of \$60 million (USD). The World Bank is lending money to the government of Nicaragua in the hopes that working with government groups and local agricultural programs will increase the standard of living for the poor. The program helps small-scale agricultural families as well as non-agricultural households in rural communities get technical training and education. According to the report on the "Poverty Reduction and Local Development Project," it has had satisfactory results. There are improvements in the inequality and some reduction of poverty, but it is still a big issue in the region.

World Bank, Document of The. "(In Three Volumes) Volume I: Main Report."  
*Nicaragua Poverty Assessment*. No. 39736-NI. (Public Disclosure Authorized).  
May 30, 2008.

This document provides detailed analysis on the state of Nicaragua's economic system done by the Central American Country Management Unit, Poverty Reduction and Economic Management Sector, and the Latin American and Caribbean Region departments of the World Bank.

The World Bank classifies Nicaragua as having a small vulnerable open economy. In 2006, the gross national income was \$1,000 (USD). It is one of the poorest countries in Latin America and most of the poverty is in rural areas. Nicaragua may only reach about half of the Millennium Development Goals by 2015. The nations problems include energy crisis, hunger, malnutrition, illiteracy, and centralization. The little reduction in poverty that has been seen may be due to increased remittances from Costa Rica and the USA, a temporary shift in agricultural prices, and demographic change in the age of the population. In response to these issues, the World Bank wants to accelerate growth and spread the effects equally, increase the effectiveness of local programs, improve infrastructure, develop credit networks and associations for land titling. They want to increase rural development and increase pro-poor spending.

## **Outline**

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- Intent of Senior Project
- Chimeneas de la Esperanza
- Plan of Paper
- Thesis

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- TOMS Shoes
- Media
- *Blood, Sweat, and T-Shirts*
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#### ***Developing and Balancing Inequality***

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### **Chapter 3: From Cal Poly to La Prusia**

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#### Chapter 4: Learning from Others

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##### *Indoor Air Pollution*

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- Connectedness
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- Not on Location
- Connection to Opportunities
- The Future

## Learning Sustainable Development

### Chimeneas de la Esperanza

By Miriam V. Mollan Gundersen

#### *Abstract*

Social inequality and environmental degradation are motivating informed young people into action and connecting impoverished regions of the world with students in more developed nations. This Social Sciences senior project is to analyze an alternative development model designed by a group of Californian university students. The project, named *Chimeneas de la Esperanza*, is designed to help impoverished Nicaraguan women start a ceramics business. The major hurdle of this mission is to establish a market for the ceramics product. Energy efficient ceramic stoves and smoke ventilating chimneys would benefit the community and avoid an impacted crafts market. The project encompasses ideas of cultural, social and environmental sustainability. In order to be holistically integrated, alternative development strategies focus on using local approaches to help the people empower themselves. This project resulted in the students gaining a greater sense of empathy and an increased interest in participating in volunteer tourism.

**Key Words:** Alternative Development, Ceramics, Deforestation, Education, Indoor Air Pollution, Microfinancing, Nicaragua, Poverty, Rocket Stoves, Social Movement, Sustainability, Volunteer Tourism.

#### *Chapter 1: Introduction*

Social inequality and environmental destruction are important issues motivating informed young people into action, and this movement is connecting impoverished regions of the world with privileged youth from more developed nations. Although these issues have been of concern for centuries, increased population and consumerism has accelerated problems. Different parts of the world now share many social and environmental concerns. However, rewards and consequences of the global industrial system are not universally distributed: poorer people and less developed regions are experiencing the most harm (Lehr, 2010). Therefore, location and socioeconomic status play huge roles in an individual's quality of life, including factors such as health and freedom. Globalization, increased transparency, tourism and technology have recently improved public awareness of these inequalities. This knowledge has prompted activists to take action, finding solutions in many forms. Individuals, grassroots organizations and

educational institutions are working in many different ways to disrupt circumstantial inequity.

Evidence of this social movement can be found in many aspects of culture, including media and university curriculum. The intent of this Social Sciences senior project is to analyze an alternative development project designed by a group of students at California Polytechnic State University in San Luis Obispo (Cal Poly). The project, named *Chimeneas de la Esperanza (Chimneys of Hope)*, is the result of being engaged in a unique development oriented class, *Appropriate Technology for the World's People: Development* (University-Honors 391). The focus group, which participated in this class to develop the business plan, consists of three undergraduate students: myself, a Social Sciences major, Tiffany Nickles of Child Development, and Kyle Giacomini from the Forestry department. In this class multidisciplinary students work together, combining different points of view, to create sustainable appropriate technology in conjunction with international non-profit organizations.

*Chimeneas de la Esperanza* is the business proposal the focus group developed in order to help impoverished Nicaraguan families generate income and work to improve issues of health and deforestation in their community. The project encompasses ideas of cultural, social and environmental sustainability as an alternative development model. The villagers who would benefit from this sustainable development program live in a co-op supported by *La Asociación 'Casas de la Esperanza'* (ACE) in La Prusia, Nicaragua. ACE is a non-governmental organization (NGO) working with international volunteers to help an impoverished squatter settlement create a community. This project combines volunteer tourism, collaboration among international universities, and alternative development theories in a broad grassroots network to address social issues related to poverty.

In order to be holistically integrated, developers must be aware of geographical and historical aspects of the region they are working in. The literature review provided in this paper builds a clearer understanding of the region's development history. This includes information on popularized ideas of development in Western culture, as well as academic theories and justifications. Furthermore, a background of Nicaraguan geography, political history and current social issues provides a foundation for designing

a sustainable business plan. Developers can also learn a lot from one another, so a couple of local projects are discussed in further detail to gain ideas of how best to move ahead. Some topics from class discussion, including indoor air pollution and deforestation, provided inspiration for utilizing ceramics to create fuel efficient stoves with chimneys. The unique product can be marketed to other development organizations and wealthier community members, avoiding heavily impacted pottery and crafts markets. This project aims to empower the local population, allowing them to break the cycle of poverty, while also contributing to rainforest conservation and improved respiratory health.

The experience of actively working on this project reveals a great deal about the history of development and about the challenges that people working in the field face. *Appropriate Technology for the World's People: Development's* class model results in connections between students and non-profit organizations in impoverished communities all over the world. Also, the research that accompanies practicing appropriate technology provides a substantial foundation for students wanting to explore the field of development further. The benefit of this class is the impact that it has on students involved. They learn to invent new solutions to global issues, without risking the livelihood of the poor with these experiments. Although this particular project may have little direct influence on the target population, this is a great form for acquiring knowledge about the world, brainstorming solutions and inspiring students to be more active in their influence on global social problems. *Appropriate Technology for the World's People* also encourages students to participate in development projects such as volunteer tourism. Although, not all solutions and ideas are implemented, they can still provide a platform for inspiring others to get involved and promote social and ecological awareness.

Chapter 2: Social Change and Development Theory

Moving Toward a Globally Sensitive World

It is becoming increasingly popular to feature 'green' and socially progressive products, and there is a trend indicating a more globally responsible culture. Globalization and increased communication technology is spreading this movement and making it easier for people in powerful industrialized nations to have significant impact on developing populations. The consequences of this movement are yet to be determined, and therefore it is a crucial time to gather and utilize the information at hand in order to go in a positive direction.

Ideals such as sustainability and consumer choice are present in fashion and entertainment. For example, TOMS Shoes, a popular company based in California, is successfully marketing to a socially motivated crowd. They promise: "with every pair you purchase, TOMS will give a pair of new shoes to a child in need." The



The founder of TOMS, Blake Mycoskie, distributes shoes to poor children in less developed countries (TOMS, 2009).

company manages to make a profit while using "the purchasing power of individuals to benefit the greater good" (TOMS, 2009). Their program aims to help children in developing countries avoid painful cuts and infections from walking without shoes on poorly maintained roads. The shoes are highly recognizable as well, which promotes an in-group of socially conscious patrons and is a form of advertisement. This demonstrates the importance of consumer consciousness in allowing companies like TOMS to establish successful business models in alliance with non-profit associations. The triumph of targeting activist youth customers shows the prevalence of these ideals within mainstream United States society.

Another example of how this social and environmental movement has spread throughout popular western culture is the emergence of related themes in the media. Some examples include bestselling books, documentaries, and television (An Inconvenient Truth, MTV's Summit, The Shock Doctrine, Born into Brothels, and The

Planet Green Channel). Social norms are represented in pop culture and also influence people's values (Lehr, 2010). The growing demands for these new themes in entertainment demonstrate their presence in our society, and can accelerate the status of the movement.

There are countless transformation-themed shows on television (including: TLC's What Not to Wear, MTV's Made, BBC's You Are What You Eat, and Oprah Winfrey's many self-help episodes). These series perpetuate fashionable ways of living to help viewers alter their outlook and 'improve' their lives. What these programs deem to be 'ideal' changes over time and is a reflection of popular ideas as well. Recently, there has been an increase in global, social and ecological issues being addressed in these types of self-help programs. There are now several new series targeting those wanting to find out how the way they live influences others in their global community (including Renovation Nation, 100 Mile Challenge, 30 Days, Blood, Sweat and Takeaways, and Blood, Sweat



Stacey Dooley, Blood, Sweat and T-Shirts participant, became an activist for the under-privileged after her life changing experience in India (Simon, 2009).

and T-Shirts). In the BBC Three television reality show, Blood, Sweat and T-Shirts, six young fashionistas experience what it is like to produce the clothes they love by working in India's cotton fields and sewing factories (BBC, 2008).

The participants endure a sort of culture shock therapy aimed to open consumers' eyes to the consequences of their wasteful lifestyles. The journey has hugely impacted the worldviews of its participants, and they are now very concerned with the source of their clothing and are even organizing fundraisers to build schools for children in India (Planet, 2010). This show has not only changed the participants but also aims to alter the perceptions of its viewers. The documentary has a website providing information on the "hidden cost of cut-price clothing" and an "online ethical fashion guide dedicated to eco-fabulous style" (BBC, 2008). Viewers are provided a means of relieving issues of poor working conditions in India by following directions of appropriate consumer choices

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provided by the BBC website. This is another way the Internet and media have increased opportunities for people to connect and organize action. The presence of these new values in television programming also identifies the power of the movement in proactive awareness and social change.

Consumer awareness and media transformation are not the only ways in which



Extravagant resorts attract customers with promise of lush rainforests and pristine beaches while contributing to environmental destruction (Barceló).

social change is progressing: volunteer tourism is another popular action feeding the growth of the movement. It allows sensitive travelers to feel they are making a positive impact on their holiday hosts. Dr. Benjamin F. Timms discusses problems of tourism in his class, *Geography of Latin America and the Caribbean*. Many exotic destinations have had problems related to their

tourism industry. Cruise ships pollute Caribbean marine ecosystems, fragile economies are perched on the whim of traveler demands, fishing villages are taken over by beach resorts, and local resources and infrastructure are catered to tourists. Although, outsiders can bring in some money, most of the profit goes to multinational corporations. The cost of tourism on the local society, economy, and environment is primarily detrimental in many poor countries (Timms, 2009). As tourism increases along with awareness of global social problems, travelers will have conflicting interests: their longing for relaxation in unique environments and on the other hand the knowledge of the negative impact their vacation could have on other members of their global community. In order to address this problem of a guilty conscience, volunteer tourism offers a way for travelers to give back. Short-term volunteer tourism programs have increased and are generally viewed as means of improving cross-cultural understanding and sustainable development (Raymond, 2008: 531). However, if these programs are not properly managed, they can lead to increased stereotypes and cultural misunderstanding. International volunteer organizations must encourage participants to analyze the broader issues that development addresses, such as the causes of poverty and international dependence, if they are to have

a positive impact on the volunteers and the communities involved (Raymond, 2008:533). Some organizations charge volunteers in order to fund their programs. Prices range from a couple hundred dollars to several thousand depending on the length of stay and usually include some meals and transportation (International, 2010). Some nonprofit organizations, such as La Asociación ‘Casas de la Esperanza’ (ACE) in La Prusia, Nicaragua, have free volunteer opportunities. ACE offers a house for its volunteers to stay in and also provides lunch during working days, which encourages international participants to visit their program. They have had positive results with volunteers that help by teaching classes, building houses, and providing expertise from their field, such as medicine, education, or development (Esperanza, 2009). This gives further opportunity for the focus group members to visit their project site. There are many different volunteer opportunities around the world today that are easily accessible to those with money, time and access to the Internet. Volunteer experiences and project outcomes vary greatly but all indicate an increase of international trans-socioeconomic interactions.

It is clear that there is a social movement geared for cultural, social, and environmental sustainability through increasing contact between hemispheres. There is definitely evidence that this movement is taking hold in western pop culture, and certainly has the ability to make a big impact on global relations. It is also becoming popular to consider the environment and society when making individual choices; however, the actual impacts of such a trend remain to be seen.

Although this movement is fresh in popular philosophy, these themes have their roots in academia. The Social Sciences, in particular, analyze how people interact with each other and the Earth. Patterns of circumstance and behavior are studied to discover answers to why people act the way they do and why some people have more than others. The goal of science is to pass on gained knowledge to help society make beneficial decisions. Sociologists identify social problems and make suggestions for possible solutions (Coleman, 2006: 2). Theories and statistics found through scientific models are helpful in realizing social change, and through these methods, many development strategies have been analyzed, tested and criticized. The newly acquired popular interest in this global movement may lead more people to become interested in these fields.

***Developing and Balancing Inequality***

Global social problems have recently become more popularized. However, philosophers have debated these issues for decades, arguably centuries. Some scholars feel that they are ethically responsible as the advancers of knowledge to use their findings to improve the world. Richard Peet, PhD from the University of California, Berkeley and author of *Theories of Development*, believes that education is not just an accumulation of knowledge,

But for many academics, students, and policymakers the drive to understand derives from an ethical, political ideal beyond understanding for its own sake. Many of us are primarily motivated by a desire to change the activities that make life possible or rather by an urge to improve them. [...] This is merely a more precise version of the purpose of radical modern science in general: making the world a better place (Peet, 1999: 12).

This argument suggests that the specialization of educational fields has occurred to better advance civilization, and therefore surplus resources are allocated to researchers because they are means for improving life. Development strategies occur when scholars uncover knowledge thought useful to improving the world and feel ethically responsible to share and apply this information however or wherever deemed appropriate.

This subject is quite broad, and what is seen as progress varies among theorists. Most modern development involves determining the causes of material scarcity, with the intention of improving the quality of life for those who lack essentials (Peet, 1999: 12). The general idea is to improve the standard of living for those in need, in order to make sure everyone is able to live reasonably well. According to Dr. Schwartz's happiness law, there is a curvature in the correlation between happiness and wealth. So, the poorer an individual, the more they would benefit from a small increase in income. On the other hand, the extremely wealthy will reach a point where they have such a high standard of living that a bump in pay would have virtually no impact on their wellbeing (Schwartz, 2009). Therefore, more lives can be influenced in a positive way by improving the equality of wealth and resources among people. The purpose of development is to use appropriate technology to increase quality of life, especially for the poor.

While the aim is to improve life, who is benefiting and how much varies by case. Generally, development is thought to promote "economic growth and national progress, and should involve other positive outcomes such as the provision of basic daily needs,

better forms of governance and a move towards patterns of growth that are more sustainable in the long term" (Potter, 2004: 5). Development projects are usually conducted in poorer nations and focus on stimulating economic progress and providing food, clothing, housing, basic education and healthcare to communities in need. Many governments support these development principles, so the United Nations has set their Millennium Development Goals to be achieved by 2015. Among others, their first three goals are to eradicate extreme poverty and hunger, achieve universal primary education, and promote gender equality to empower women (United, 2009). This indicates some international consensus on what problems need to be addressed and demonstrates the responsibility more developed nations have in using their resources to support transformation.

Members of the UN have established what they aim to do; however, they do not have localized plans of how to achieve these goals. This is a great endeavor, and it is difficult to promote social change at a large scale. There are challenges to the process that sometimes lead to greater relative poverty among individuals and regions. Negative consequences can also include international dependency, where poorer nations are economically, socially and politically bound to richer nations, and held in debt by oppressive contracts and policies (Potter, 2004: 5). These negative outcomes are however usually the result of trickle-down based projects, which have been highly criticized for their Eurocentric bias and capitalist motives. The World Bank is one example of a huge organization able to finance such large-scale development projects, which can have enormous impact on communities. The World Bank has influence in many developing nations across the world and also has a presence in Nicaragua (World, 2007). The International Monetary Fund (IMF) and the World Bank often work in collaboration to loan huge amounts of money to poor counties in order to finance development projects. However, these loans usually come with stings attached. The IMF has a tremendous amount of control over government policies of the country that is receiving aid. In July 2009, Nicaraguan officials complained that the IMF had made absurd demands when they asked the government to end tax exemptions on non-profit entities (Bretton, 2009). NGO's like ACE also express frustration with some of the IMF's regulations. The fund's plans have frozen educational spending at 3% of Nicaragua's GDP. Meanwhile, schools

are insufficiently funded and teacher salaries are extremely low (Esperanza, 2009). Wealthier nations in Latin America, such as Venezuela, have decided to negotiate to quit the fund in order to gain economic freedom (Klein, 2007). This demonstrates the kind of policy done by international entities that influence development at every scale. Large and expensive blanket development projects, such as those the World Bank and IMF are usually involved with, have been accused of unethical practices and produced some negative responses, which creates opportunities for resentment of foreign aid.

It is inevitable that large-scale, Western-run projects, which are directed at poorer countries with very different societal structures, experience some problems of cultural clashes, miscalculation and even disastrous consequences. The main point of concern is that neoclassical approaches are constructed from a Eurocentric point of view, with its own standards of what is good and what is considered progress. This may be extremely different from the values of the society that is targeted for change. “The fundamental dualism exists between what is seen as a traditional, indigenous, underdeveloped sector of the one hand, and a modern, developed and Westernized one on the other” (Potter, 2004: 83). Not only do developers fail to realize that their standards are different, but they tend to see themselves as better and more advanced than the people they are trying to help. It is clear that some development projects have caused more problems than they have relieved, and that this is due to the promotion of Western-style progress with an attitude of being at an elevated hierarchal position. In response to this criticism, various other approaches to development have been examined to discover more positive ways to confront gaps in civilization.

In order to address the oppressive nature of Eurocentric development strategies, minority paradigms are utilized to lessen biases. Ethnic Studies and Feminism, for example, focus on the point of view of the oppressed and see modern society as a socio-historical structure, which favors rich white men (Lehr, 2010). Seeing the world from this perspective will inevitably lead to radically different development models, addressing racial and gender issues related to poverty. Feminists view development as active policies that alter gender relations where most efforts place men at a position of privilege, leaving women and children more vulnerable to victimization, disease and disasters (Peet, 1999: 122). Understanding deeper causes of poverty through these perspectives provides a

greater chance of breaking these patterns in new development strategies that truly aim to help those at the greatest disadvantage. Furthermore, Dependency theory is one example of how non-Western ideas have been influential in combating problems of ethnocentric development projects. Structuralists from Latin America and the Caribbean gained a lot of attention in the 1970s and focused on the subterfuge of frameworks propping up society (Potter, 2004: 108). “Dependency theory counters the notion that European development derives, exclusively or mainly, from European sources” (Peet, 1999: 122). This model emphasizes the importance of colonial and neocolonial exploitation in the growth of European economies. Structuralists used ideas of neo-Marxism to explore their perspective of international manipulation. The structuralist perspective reveals that Third World countries have valuable resources and intellectual abilities, which have been underemphasized by neoclassical approaches. People in poorer regions have the power to influence their own progress, yet they have been held back by a history of oppression. Locals have greater understanding and insight into their own environment and therefore are better equipped to come up with applicable solutions to the problems they face.

Since the 1970s, these ideas have been tested, altered and combined with other thoughts to create more modern and applicable development strategies. By 1996, *alternative development* had been summarized as:

- A move towards direct redistributive mechanisms specifically targeting the poor
- A focus on local small-scale projects, often linked to urban or rural community-based development programs
- An emphasis on basic needs and human resource development
- A refocusing away from growth-oriented definitions of development, towards more broadly based human-oriented frameworks
- A concern for local and community participation in the design and implementation of projects
- An emphasis on self-reliance, reducing outside dependency and promoting sustainability (in Potter, 2004: 118)

Alternative development strategies use local approaches to help impoverished people empower themselves in their own way. The non-neoclassical view focuses on the needs of the people by using progressive participatory methodology. In this model, the socio-economic livelihoods of the poor are of top priority, which is directly linked to managing natural resources. Sustainability of the local environment and economy is based on

community participation in designing and implementing appropriate development strategies and building community ties. Alternative development also emphasizes sustainability, which provides for “the present without compromising the ability of future generations to meet their own needs” (in Potter, 2004: 117). A problem usually associated with development is the idea of dependency, when projects become reliant on continual input from developers. Alternative development, on the other hand, aims to build a foundation that will support itself even after developers have left the area and also incorporates sustainable resource management. Many people today are concerned about how future generations will fare if humans do not rationally budget the Earth’s resources. Alternative development addresses global issues of poverty at a micro-scale and focuses on sustainable solutions that empower communities.

The student development project, *Chimeneas de la Esperanza*, utilizes the alternative development paradigm to address poverty in La Prusia, Nicaragua. The group of students is connected with an active community project and other non-profit networks to develop a product that can be sold and used locally. This business will provide an opportunity for women in the community to work together, learn valuable skills and broaden their social and professional networks. The ceramics project aims to meet the needs of the poor by providing some families with income by encouraging local participation in the design and production of the chimney stoves. The plan does not only address the needs of the workers, but also the general community by taking into consideration issues of indoor air pollution and deforestation. Furthermore, *Chimeneas de la Esperanza* incorporates ideas of sustainability by using local materials and targeting a local market. This increases reliability and will reduce external dependency. Also, by analyzing the impact of wood as a common cooking fuel, the project considers the environmental impact of local practices. There are many ways to approach social problems such as extreme poverty, but *Chimeneas de la Esperanza* uses alternative development in the hopes to reduce the effects of ethnocentrism and increase local power.

### Chapter 3: From Cal Poly to La Prusia

#### Class Consciousness

In the spirit of Cal Poly’s ‘Learn by Doing’ curriculum, a class project inspired *Chimeneas de la Esperanza. Appropriate Technology for the World’s People: Development* (UNIV/HNRS 391) is lead by Dr. Pete Schwartz, a physics professor who volunteered with the Peace Corps in Fiji and is currently working with students to develop efficient solar ovens for poor rural communities. Dr. Schwartz aims to make students critically aware of development and committed to making a positive change in their target communities (Schwartz, 2009: 1). The class is discussion based and includes a broad overview of international development. Students form focus groups of three to five students in order to invent appropriate designs for sustainable development. Students are encouraged to collaborate with mentors from the university and experts from the field (Cal, 2009: 394). Readings discuss themes such as colonialism, wealth and inequality, politics, development projects, and issues prevalent in less developed regions of the world, such as indoor air pollution and deforestation. Facilitators, such as Andy Kreamer from the UC Berkeley research team, and other guest lecturers also give insight to their fields throughout the quarter. The course fulfills a section of General Education electives and therefore attracts students from all colleges, facilitating a multidisciplinary environment. The aspect of holistic sustainability presents challenges of thoroughly analyzing situations to ensure that all parts of the process can be successfully integrated into the existing community. *Appropriate Technology for the World’s People: Development* is a course intended to expose students from different fields to global issues and difficulties of implementing new technology.

The students are asked to choose from a list of project descriptions and accompanying organizations from different communities around the world. Dr. Schwartz had recently visited Nicaragua and met with Judit Targarona, an officer and supporter of La Asociación ‘Casas de la Esperanza’ (ACE). They discussed a ceramics kiln, which had been abandoned by a previous volunteer and decided that making use of this ceramics kiln would be a good foundation for a class project (Schwartz, 2009). The people of La Prusia need a profitable business, and have a kiln that could potentially be

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utilized in such a business. Students from *Appropriate Technology for the World's People* must research possible appropriate technologies that can be utilized in this situation. With these circumstances in mind, the group developed *Chimeneas de la Esperanza*, which is a plan that aims to use the existing ceramics equipment to empower the poor through alternative development. This model utilizes existing social structures and resources in the area to help integrate the plan into the community. On the route to designing an integrated development plan, the first step is to gain an overall knowledge of the local region: the land and the people.

**República de Nicaragua**

The Republic of Nicaragua is located in Central America, bordering Costa Rica and Honduras. On the East coast is the Caribbean Sea, and on the West, the Pacific Ocean. Nicaragua is popular among tourists for its beautiful beaches, exotic landscapes, and abundant wildlife. However, the nation has had its share of problems as well.

Nicaragua is surrounded by water and has abundant natural resources. It has the largest landmass of Central America

and is also home to Lago de Nicaragua the biggest freshwater lake in the area (Central, 2010). The Pacific region contains fertile, lowland plains rich with volcanic soil from the several giant volcanoes over seeing the region, so the west is dense with people utilizing the land (Merrill, 1993). Not only is the area fortunate in its fresh water resources and productive land, but also has valuable raw materials such as: precious metals including gold, silver, copper, lead and zinc, and resources like timber, fish and clay (Central, 2010). These attributes display the potential this land has for being able to provide for its people.



Nicaragua is surrounded mostly by tropical oceans, and Granada is located on the coast of Lake Nicaragua (Compassion, 2010).

Although the region of Nicaragua has great promise to flourish as one of Latin America's top economic powers, it has been held back because of its turbulent political history and natural disasters, such as hurricanes, earthquakes and volcanic eruptions (Clawson, 2006: 40). Western Nicaragua is likely to experience earthquakes and volcanic eruptions because of its position over two major converging tectonic plates. Every year, hundreds of quakes shake the land and damage infrastructure. In 1931 and then again in 1972, the capital was all but destroyed (Merrill, 1993). Not only is the region continuously inflicted by natural disasters, the country is also devastated by manmade environmental degradation, such as deforestation, soil erosion, and water pollution (Central, 2010). The country is now threatened by resource destruction. However, there is no comparison to the impact which colonial powers inflicted on the country and its people.

In the past, the fertile plains of Western Nicaragua supported dense agrarian societies (Clawson, 2006: 40). Central America also served as a passageway for pre-colonial populations to travel between the American sub-continents, and supported large complex civilizations. However, there was a lot of war amongst Mesoamericans, and they also experienced some natural disasters as well. Then, with their advanced technology and foreign diseases, the conquistadors further aided in the brutality of the region's history (Diamond, 1999). Pre-colonial history describes the state of society before Western influence and demonstrates the independent wealth and power which the area had before it had been 'discovered.'

By the early 16<sup>th</sup> century, the Spanish had colonized the Pacific coast of Nicaragua (Central, 2010). However, they were not the only ones competing for the territory. The British settled the Eastern region, while the Spanish occupied the West, creating conflict in the region. The Spanish also fought amongst themselves; the conservative interior agricultural city of Granada competed with liberal León on the Pacific coast. The capital eventually became Managua, which is located in between the two cities (Clawson, 2006: 125). Not only is the origin of Nicaragua's capital wrought in conflict, but its route to becoming a nation was also drawn out. "Independence from Spain was declared in 1821 and the country became an independent republic in 1838. Britain occupied the Caribbean Coast in the first half of the 19th century, but gradually

ceded control of the region in subsequent decades” (Central, 2010). Nicaragua’s turbulent past has certainly added to the nation’s difficulty in establishing security.

There has also been some political controversy in more recent history. Governmental corruption caused a violent uprising, which led to a spurt of civil war in 1978. The Marxist Sandinista guerrillas took power in 1979. The leftist group built up the military and discouraged private enterprise with the assistance of the USSR. The United States supported a counter movement that was a devastating failure, and as a result, “the nation remains intensively divided” (in Clawson, 2006: 125). Political schemes are played at all levels and can have lasting impact on the people of the nations involved. For foreign developers, from the USA for instance, it would be beneficial to be educated on how their governments have influenced the other, in order to better predict stereotypes and opposition.

As well as understanding more about the history of the region, the way the current system is running is also of interest and can reveal potential political stakeholders for various projects. For Nicaragua, “Free elections in 1990, 1996, and 2001, saw the Sandinistas defeated, but voting in 2006 announced the return of former Sandinista President Daniel ORTEGA Saavedra. The 2008 municipal elections were characterized by widespread irregularities” and the nation is still experiencing political challenges (Central, 2010). This long history of struggle is evident in other issues relevant today.

The current situation for many people living in Nicaragua is devastating. Almost 80% of the nation’s 5.5 million people live on less than two dollars a day, and it is ranked only below Haiti as the poorest country in all America. Hence, the people are not making enough money to meet their basic needs (Esperanza, 2009). There is also a high rate of underemployment, where people are not reaching their full potential in the workforce (Business, 2008). Malnutrition is a consequence of this. While the average in Latin America is 10.2%, about 27% of Nicaraguans are lacking in adequate daily nutrition (Esperanza, 2009). When people do not eat sufficient amounts of calories and micronutrients, they become less productive and this leads to more problems. There is also a deficit of education in Nicaragua. Only 67.5% of their total population over the age of fifteen could read and write in 2003 (Central, 2010). This presents a problem in their accumulation and transfer of knowledge. Education and writing are great tools that help

civilizations be efficient and connected; therefore this is an area that developers often try to address. Generally, the current situation has room for improvement to make sure that Nicaraguan people can at least get the food they need to live.

Nicaragua has the natural resources, which could produce enough for its people to have a better standard of living. However, environmental disasters and degradation, as well as a violent colonial history and political turmoil, have left the Nicaraguan people underemployed, undernourished, and undereducated. This historical, political and social analysis is helpful in understanding some circumstances, which have led to the current situation in La Prusia, the location of the *Casas de la Esperanza* development project.

### ***La Prusia’s Plight***

Poverty is especially apparent in the squatter settlements of La Prusia, which is the project location for the ceramics business development plan, *Chimeneas de la Esperanza*. The NGO that *Chimeneas de la Esperanza* is working with, La Asociación ‘Casas de la Esperanza’ (ACE)



Infrastructure is poor in La Prusia, and many do not own the property where they build their homes (Esperanza, 2009).

has been in the area for some time providing micro-loans for local families to build homes. La Prusia quarter is a couple miles southwest of Granada, a city in Western Nicaragua. There are about two hundred families living there on land that is not their own. Their homes are constructed from various scraps of building materials and many have earth floors. Full employment is rare and there is a deficit in educational programs available. “The need of technical education and jobs for young people and adults is very clear. The living conditions of most of these families are very harsh. Urgent measures should be taken for helping this young community to use their energy and dynamism for getting out of poverty” (Esperanza, 2009). This testimonial is from ACE, which has been working to solve these problems.

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Although Nicaragua is a beautiful country with many resources and a diverse population, everything from hurricanes to neocolonial manipulation seem to work against the nation’s chance to achieve economic independence and political stability. As a result, the country does not have the proper community infrastructure to supply opportunities for the many poor to reach their full potential. Furthermore, poverty is depriving families of the nutrition they need. This leads workers to have less energy and suffer from more frequent illness, perpetuating the cycle of poverty. The dire situation in Nicaragua has attracted developers seeking to reduce poverty. Experiences of other organizations in the region enlighten successful aspects of their models, which could be used to inspire new designs such as *Chimeneas de la Esperanza*.

**Chapter 4: Learning from Others**

**Casas de la Esperanza**

La Asociación ‘Casas de la Esperanza’ (ACE), also known as Esperanza Housing and Development (EH&D), was started in Cambridge, Massachusetts by several people from the USA, Spain and Nicaragua. The organization has maintained a transparent operation. They receive all of their revenue by donations from institutions, private businesses and individuals. ACE keeps its donors updated on what their money is spent on, and have people volunteer their time and labor to reduce cost and expand



ACE aims to build a strong community with the help of local families, international volunteers and donations (Esperanza, 2009).

cross-cultural empathy. International volunteers promote the organization and work on site in collaboration with Nicaraguan families. This multinational coalition has already achieved a lot and is continually expanding (Esperanza, 2009). With the help of donors, volunteers, and community members, ACE helps improve community services and infrastructure. La Prusia lacks healthcare, water, roads, electricity, financing and education. In order to address the lack of health care, ACE is working with a local medical center the Palmira Clinic to get weekly health visits. Doctors and nurses come to La Prusia to see patients and provide medical supplies. In addition to providing healthcare, the community works to solve other problems. For a long time, it has been extremely costly and difficult for the locals to get water, because it had to be transported to La Prusia from Granada. ACE has worked to get well water readily available to the community. Furthermore, they are working to keep the road operational and provide electricity to the community (Esperanza, 2009). The people in the community were living in shanties but now many have been able to get micro-loans, which has enabled them to build homes and start businesses. The Grameen model was the inspiration for this program, and at least 36 families have been able to build their own homes through this

plan (Esperanza, 2009). Owning a home increases security, community and provides a stable foundation to grow.

For the people in the area, ACE is also working to supplement education by having volunteers from all over the world come to teach. Local children do not have the opportunity to go to school for a full day, so ACE has created a school-workshop where volunteers help them with their studies. They have also collaborated with the Ministry of Education to use the program ‘Yo sí puedo’ to improve the literacy of adults and teenagers. English and computer classes are taught to the most advanced students while others are learning to read and write (Esperanza, 2009). Their influence in education is growing and they have begun teaching workshops in handcrafts, like sewing and jewelry. The courses have been popular especially with young women. If they manage to sell their products, it could potentially produce income, but there are many artisans in the area so they are having problems marketing their goods.

*Chimeneas de la Esperanza* is especially concerned with the success of ACE, because they are in the target community already working with the local population. The NGO has managed to build a community by financing micro-loans for housing materials. They also have a health center and a schoolroom, where they host after school and adult education programs, as well as volunteer housing for those who wish to donate their time. Furthermore, the community has managed to install water and electricity and is continuing to improve services. The potters in the business would have access to these benefits, and the workers would most likely be women living in the village co-op. There is a strong community atmosphere and communal areas where people can spend time together. There are also connections with institutions within the United States and Spain, and there are always people there, working collectively. This is a good foundation and an asset to the potential ceramic chimney stove business. Most importantly, ACE has a specific need to which an appropriate solution might be found. There is a ceramics kiln in the village not being used, which could be the foundation of a sustainable business that will be a beneficial contribution to the community.

**Microfinancing**

The Grameen Bank was the inspiration for ACE’s successful home loan operation, and microfinancing could be a potential way of funding the start up costs for *Chimeneas de la Esperanza*. Professor Muhammad Yunis started the bank in 1976 with only \$27. Today, the Grameen Bank provides financial services to over 7 million poor families. He won the Nobel Peace Prize of 2006 and the Presidential Medal of Freedom from President Barack Obama in 2009. The goal of the Grameen Foundation, an organization that has evolved from the original Grameen Bank, is “to see poor people, especially the poorest and those living in harder to reach areas, have access to microfinance and technology and as a result of access to these services, move themselves out of poverty” (Grameen, 2010). The international recognition that this organization has generated has made this a well-known development model, which people are incorporating all over the world.

In Bangladesh, the site of the first Grameen Bank, and in other poor regions, fifty dollars is enough for a woman to increase her profit enough to finally save some money and send her children to school. “Microcredit providers have found that women, who receive the bulk of these small loans, are better credit risk and more likely to spend their additional earnings on their families” (Iritani, 2006). The success rate of female lenders is also appropriate to the ceramics business because women are traditionally potters in Nicaragua and are most likely to be running the chimenea business. Furthermore, the model of microfinance has now spread and other important investors are getting involved. The Gates foundation has started investing millions of dollars as targeted grants to help develop microlending programs around the world. Investing in poor areas can actually be profitable because the borrowers are motivated to pay loans back and the interest rates are high in some of these areas. Microfinancing programs help people invest in themselves so that they have a stake in their own success. The loans provided by ACE’s program are interest free and not for profit, designed to improve people’s standard of living. In Nicaragua, there are several other microlending operations working today.

**PRODEL**

Alfredo Stein analyzed the results of PRODEL, which is a local development group in Nicaragua financed by the Swedish International Development Cooperation Agency. The program was based in eight cities throughout Nicaragua and impacted 38,000 households in the time between 1994-1998. The program distributes small grants for infrastructure and community works projects, and gives loans to those of low income for home improvements and micro-enterprises. The goal of this program is to increase participation of the local community and encourage continued input after program funding ends. They found that it was extremely important to keep the cost of projects down and to work with existing institutions and social organizations, in order to sustain the benefits of the programs after their completion. Their methods were effective and many of PRODEL strategies for development and poverty reduction are still being used by other organizations today (Stein, 2001: 11-35). *Chimeneas de la Esperanza* takes into consideration the suggestions of operating the project as cheaply as possible and using existing networks to encourage the longevity of the project. PRODEL is still active today and maintains its values of human relations, quality products, meeting basic needs, and financial transparency (PRODEL, 2005). Perhaps in the future, *Chimeneas de la Esperanza* will be able to benefit from this program as well. PRODEL has many similar objectives and this could lead to a beneficial coalition.

PRODEL is a locally based group that is working in several Nicaraguan cities to offer small scale financing. This could provide to be an opportunity for financing *Chimeneas de la Esperanza* as well, and examples of past efforts like this project provide great information on how organizations function locally.

**Potters for Peace**

Potters for Peace is a non-profit organization based in the United States and operating in Nicaragua. Potters for Peace also has a similar agenda for alternative development and could be a beneficial partner for any small ceramics business, like *Chimeneas de la Esperanza*. Their goal is to help create networks of potters around the world. "Potters for Peace offers assistance, with the goal of better livelihoods, to our fellow craftspeople in the developing world" (Potters, 2006). They work with about six

hundred people, mostly potters, and about fifty of them are active members of the organization. Like ACE, Potters for Peace is also funded by donations. They receive small grants and hold a craft fair yearly to sell donated work from the potters they work with and raise money for the organization (Potters, 2006). Potters for Peace operates on a budget of only one hundred thousand dollars per year, and is a very transparent organization. They have been around for a long time and have experienced some challenges, but still manage to put forth their mission in making positive connections for potters.

Waves of government and natural disasters have influenced the needs of the people as well as how the organization operates. The political environment of Nicaragua played an especially important role in the beginning of Potters for Peace.

After the 1979 revolution, Sandinista Nicaragua made cultural development one of its priorities, encouraging the revival of indigenous arts and crafts, partly through the formation of pottery cooperatives. During the ensuing U.S.-sponsored contra war and economic embargo, grassroots development projects struggled against almost overwhelming odds and hundreds of international organizations – including Potters for Peace – came to help governmental organization in Nicaragua (Potters, 2006).

The party in charge had great influence over the government policy concerning Nicaraguan citizens. The Sandinistas supported the potters, but the counter-movement had different priorities. The political flip-flop left the people neglected, giving Potters for Peace an important place to make an influence.



Potters for Peace utilizes local materials to make ceramic water filters (Potters, 2006).

Environmental impacts also alter the course of organizations. In 1998, Hurricane Mitch created a new need for clean water. "Solution in a Pot," an article by Sara Corbett for *New York Magazine*, describes an example of appropriate technology that was successfully established in Nicaragua. After Hurricane Mitch, Potters for Peace helped develop the clay pot water filter by adding sawdust to the clay mixture. This made the pots extra porous and able to turn floodwater into drinking water. Local workers are still making the filters from local materials. Furthermore, Potters for Peace has continued to encourage the production and use of these filters throughout the world (Corbett, 2008:

38). This is another example of why it is important to stay informed with current events to anticipate conflicts and better predict the needs of the people.

Although the water filters were a beneficial action, the primary objective of the organization is to create networks among potters and provide them opportunities to improve their production. They create an exchange of ideas and techniques among ceramic artisans. Potters for Peace even provides travel expenses to create unique opportunities for poor artists to share knowledge. They also give training and materials for building wheels, extruders, energy efficient kilns and other equipment (Potters, 2006). In Nicaragua, Potters for Peace keeps contact between rural potters and helps them sustain their businesses, and search for new resources to exploit. “Despite Nicaragua’s perilous economic situation as the hemisphere’s second poorest country, there is an in-country market for pottery and [Potters for Peace] works with the artisans to make the most of it” (Potters, 2006). In order to sell in their local community, Potters for Peace has provided road signs with a common logo to increase sales countrywide. They have also built showrooms, improved workshops, promoted artisan fairs, produced brochures and are planning a website for Fair Trade sales. All of these avenues promote a stronger community network of Nicaraguan potters. Not only does Potters for Peace promote networking, but they also believe in sustainability by promoting ideas such as the use of fuel-efficient kilns. Potters for Peace is designing energy efficient systems, which incorporate agricultural waste to reduce the use of firewood in ceramic production. This is in response to the growing cost of firewood due to deforestation, and the soil erosion that accompanies it. This organization is still active in the area and is an important connection for *Chimeneas de la Esperanza*.

All of these models that use non-neoclassical, alternative development strategies serve as inspiration for new development organizations and are examples of successful projects. These sustainable plans can be used as blueprints for future development and can also provide mentorship and support for smaller organizations. Studying past projects and sharing knowledge is extremely important to all problem solving, and is certainly an asset to the design of *Chimeneas de la Esperanza*.

## Chapter 5: Research and Development

### The Project

Since Dr. Schwartz of Cal Poly and Judit Targarona of ACE identified the primary issue that the focus group should address as unemployment and the solution as utilizing an abandoned ceramics kiln, the group had a specific goal applicable to the local people’s current need (Schwartz, 2009). Connecting with ACE and having this parameter to work within, was the beginning of *Chimeneas de la Esperanza*. Once the purpose was



The abandoned kiln at ACE is the focus of the student project (Esperanza, 2009).

established, the next step was to research the significance of ceramics in the local culture. Contact with ACE and class discussion exposed further challenges, which are addressed in the final proposal. The major hurdle of this mission is to establish a market for the ceramics product. Therefore, the focus group created the idea of helping the crafts workers develop energy efficient ceramic stoves and smoke ventilating chimneys. *Chimeneas de la Esperanza* is the end result of this experiment and represents a sustainable business model that

addresses individual and community needs from a cultural, social and environmental perspective. *Chimeneas de la Esperanza* uses a traditional craft to address issues of poverty, health and ecology. Not only do the chimeneas reduce indoor air pollution, which is common in Nicaragua and can cause severe respiratory illness, but they are also more efficient than traditional stoves. This allows women to use less fuel when cooking, reducing cost and slowing deforestation.

The group is able to utilize various methods of research to get information and advice about the project. Not only does the project rely heavily on Internet and library research, but communication with various NGOs and professionals is also very influential in the development of this project. Class discussion contributes further to the evolution of the plan. In order to practice sustainable development, it is important to have a culturally

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relevant model; therefore, the focus group investigates history and development of ceramics and its process.

**Ceramics in Nicaragua**

Ceramics is of historical significance to the Nicaraguan people. Pottery making has a rich cultural heritage in the region and Nicaragua is known for its own unique technique and style. For Nicaraguan potters, it is important for their pieces to have an aesthetic aspect and a practical use. Using an art that has been around for generations includes the local culture and is a way for different people to relate. It creates an exchange where



Nicaraguan pottery is both beautiful and practical. Intricate designs often depict wildlife such as birds and flowers (Sun, 2008).

local villagers and volunteers learn from each other. Also, because pottery is a traditional practice in Nicaragua, all the raw materials necessary are already available in the region. Potters for Peace is continually searching the landscape for new sources of clay and also has materials tested and analyzed for quality (Potters, 2006). This helps local crafters to find reliable and cheap sources of raw materials. In order to make traditional Nicaraguan pottery one only needs a kiln and firewood, local clay and pigments, and a few tools. All these materials are pretty easy to come by in Nicaragua.

Pottery is also a creative process, which gives workers freedom of expression and control over their craft. Being creative at work gives greater empowerment to the person doing the job. Individuals not only earn income for their family, but also get a sense of accomplishment and pride. Ceramics is also a community event, which creates strong bonds, especially among women in Nicaragua (Potters, 2010). Using the native art of pottery is one way of utilizing local expertise and resources to involve a greater section of the community and create a network of connections. Combining traditional techniques with technical skills can improve their chances of managing a sustainable income. Ceramics in Nicaragua have traditionally served both aesthetic and practical functions, and the chimney stoves created by *Chimeneas de la Esperanza* would have to be consistent with this traditional view of ceramics. The chimneys would not only be a form

of art, expression and a symbol of status within each home, but it is also an essential tool for cooking food.

**Impacted Markets**

When the focus group first contacted ACE, Professor Angel Sáenz-Badillos informed us of the biggest problems facing the success of the business within La Prusia: there is a highly impacted crafts market. He explained that many of the women in the community had already been producing jewelry pieces for sale to tourists, but were not able to sell enough to make money. “Being realistic, we cannot expect a great enthusiasm from the side of the La Prusia residents. It is easy to understand: they have had many expectations arisen by good-willing persons that finally have not produced what they are interested in: some income for the family” (Sáenz-Badillos, 2009). The saturated market discourages them from continuing their fruitless work. With so many women producing arts and crafts and trying to sell their goods locally, the women of ACE have been unable to break into the market. Furthermore, the number of competitors has inevitably driven prices of crafts down. So the task is not simply to create a pottery business, the people need something that is unique about their ceramics product, which sets them apart from local artisans.

**Indoor Air Pollution**

Class discussion in *Appropriate Technology for the World’s People: Development* covered issues of indoor air pollution. This is a problem in many parts of the world, and 57.09% of Nicaraguans are exposed to indoor air pollution, according to Yale University’s Environmental Performance Index (Yale, 2008). Using solid fuel, such as wood or dung, to cook food indoors without proper ventilation is the main cause of indoor air pollution. Harmful chemicals are released into the air. Once inhaled, these particles become lodged in the lungs, and lead to respiratory disorders, especially asthma and acute lower respiratory tract infections. According to a study by the World Health Organization in 2006, 1.6 million deaths worldwide can be attributed to indoor fuel use (World, 2010). “Smoke in the home is one of the world’s leading child killers, claiming nearly one million children’s lives each year. Illness caused by smoke kills more children

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annually than malaria or HIV/AIDS” (Warwick, 2004: 1). This is clearly a big health risk for Nicaraguans and should be an issue of concern to developers working in the area. This problem primarily affects women and children in the developing world, because women typically spend more time in the home cooking, usually looking over their children (Warwick, 2004: VI). Therefore, it is important to include women in the solution to this problem: they have the most to gain. Aspects of Feminist Development Theory should also be considered in this situation, making sure that women are empowered to fight against indoor air pollution for the sake of their health and that of their young children. Educating people in the causal relationship between the smoke and breathing issues are essential in reducing the problem. Some people may not have associated the two, the smoke and the illnesses, or do not know how to improve the situation and therefore are not doing anything to make their homes ventilated.

However, it is not just the lack of information that is the trouble. Not only is it a cultural norm in many regions of the world, but some people are also forced to use solid fuel because it is the only thing available or affordable to them. Solid fuel can usually be gathered or acquired more easily than other forms of fuel (World, 2010). This problem affects more than just lifespan. Respiratory disorders impede the ability of the villagers to work full days and provide for their families, and in this way contribute to poverty in Nicaragua. Chimneys reduce this problem by funneling the smoke out of homes and increasing air circulation. However, it is important to make the chimneys affordable to those most at risk.

**Chimneys**

Chimneys are vertical hollow tubes, which create a draft to air out smoke and indoor air pollution from a building. Hot air is lighter than cool air and expands, so the hot smoke generated from a fire will be forced up through the pipe (Answers, 2010). Chimneys remove smoke from the inside, reducing indoor air pollution. Organizations such as Global Vision International are already collaborating with volunteers to provide stoves with chimneys in rural Nicaragua (Global, 2008). Also, Peace Corps workers in the Dominican Republic are building improved ceramic stoves with chimneys out of local materials (GenV, 2009). Because several organizations in the region are operating to

install products that reduce indoor air pollution, there is perhaps a market here. The



Some elements of Mexican-style chimeneas, popular in North American gardens, could be incorporated into designing technology appropriate for relieving indoor air pollution (Wikipedia, 2010).

Nicaraguan women can produce the chimneys from ceramics and sell them to the non-profit organizations that are working locally to install chimneys in homes.

Ceramic chimneys have been made in a variety of forms including classic decorative European chimney pots and traditional Mexican chimeneas invented by tribesmen to shelter fire from rain (Wikipedia, 2010). This demonstrates that ceramics could be an appropriate technology for making ventilation chimneys.

**Deforestation and Cost**

Solid fuel does not only contribute to problems of indoor air pollution, but also to other issues such as deforestation. According to Bruce Peninsula Bird Observatory, “between 1990 and 2000 alone, Nicaragua lost 27% of its natural forest cover. Some of this loss can be attributed to wood burning, as more than half of Nicaragua’s households use wood as the only source of energy for cooking” (Bruce, 2008). Deforestation is an issue of sustainability and an indication that timber resources are not being managed effectively. It also leads to other problems including soil erosion, water contamination, and habitat loss. Deforestation is also a concern for biodiversity. In Nicaragua alone, 39 higher plants are threatened with extinction, and there are many unique species throughout the Nicaraguan rain forest at risk (World, 2006). It is a shame to let these species disappear forever because of poverty and the reliance on solid fuel.

However, wood has many uses, and humans rely heavily on having trees available for fuel, building material and other products. Increasing the efficiency of stoves would at least help reduce the impact which cooking has on killing the rainforest. The high costs and significant time spent acquiring the wood or other material to be burned could also be lessened by higher efficiency stoves. Although ACE has been able to provide some affordable electricity to the villagers in the area, many Nicaraguans still rely on solid fuel

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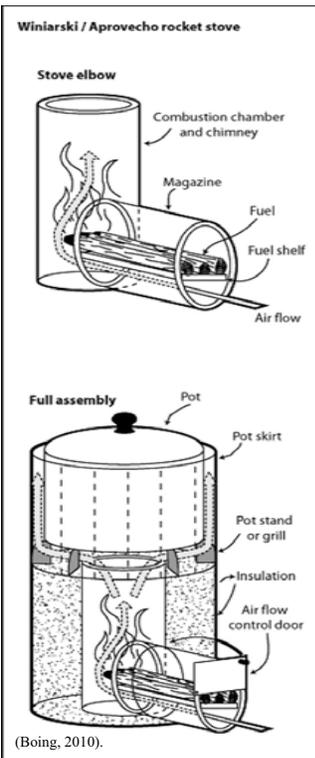
for cooking. This is expensive and time consuming. As the areas around settlements become more deforested, the price of fuel and the time spent scavenging increases. By making their stoves more efficient, these problems should also be lessened because they would need less wood to get the same amount of heat.

**Rocket Stoves**

Rocket stoves are energy efficient alternatives for many women in the developing world relying on solid fuel cooking to make their family meals. Rocket stoves channel

heat to the desired place so that less fuel is needed to heat the food. Most rocket stoves have an L-shaped interior with some form of insulation surrounding it, and can be made of ceramic materials. The twigs or other combustible materials are usually placed through an opening at the lower portion of the 'L,' and the fire is kept at the base, while the heat is channeled up to the pot sitting directly above the flame. Confining the direction which heat is able to disperse focuses energy on what is being heated.

Many organizations are currently distributing these types of stoves to poor people in Africa and other parts of the world. There are also several online communities dedicated to the advancement of rocket stoves. For example, The Rocket Stove Design Base is a volunteer operated online community, which enables efficient stove enthusiasts to share their ideas and learn how to build efficient rocket stoves (Rocket, 2009). This allows developers to work



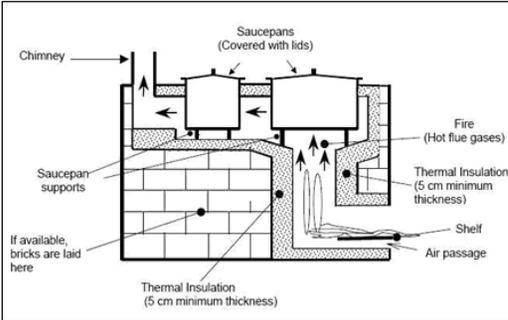
together in designing appropriate technology, rather than competing. Another such

grassroots program is HEDON Household Energy Network. This webpage is a resource for anyone "actively pursuing a cleaner, affordable and more efficient household energy sector." This includes practitioners, policy-makers, funders, business-owners and volunteers (HEDON, 2010). These large communities of supporters, allow newcomers to get acquainted with designs quickly and get help with developing specific models appropriate for different areas. These networks could help the villagers of La Prusia design a model that will work well in their location.

Rocket stoves are extremely popular due to the ease of construction, the wide range of materials it can be produced with, and the high relative amount of heat generated by less fuel. These stoves are even sold completed for camping and emergency preparedness (Stock, 2009). The popularity of these stoves demonstrates that they are well tested and reliable.

This design could be combined with a chimney to create a unit, which addresses several problems associated with the current methods of cooking.

With the original contribution of a specific goal from ACE



This integrated rocket stove with chimney might be similar to the design which the Nicaraguan potters create (Stoves, 2009).

and class guidelines and support from professors the project got its start. In the end, the result is an idea to incorporate aspects of the traditional Nicaraguan art of ceramics in to a functional product with a local market, which also addresses issues of health and ecology in the local community.

## Chapter 6: Conclusions

### *Chimeneas de la Esperanza*

The primary goal of *Chimeneas de la Esperanza* is to plan and implement a socially, culturally and environmentally sustainable business model that provides a consistent income for impoverished families in the village of La Prusia. Pottery has been made in Nicaragua for centuries and ceramic pieces usually have an artistic component as well as a useful function. For the women in the community, combining the ideas of a chimney to address indoor air pollution and a rocket stove to increase fuel efficiency in a ceramic stove making business would be a unique way to increase income. The chimeneas will further reduce poverty by promoting health and decreasing money and time allocated to getting cooking fuel. The hope is to give these artisans, traditionally women producing crafts, a new market by introducing a ceramic product that is not being produced by others. The chimney stoves could be sold to local families that can afford them and also to development organizations in the area.

However, the skills of traditional Nicaraguan pottery and ceramics have not been practiced in this community. In order for this trade to become profitable, the women of La Prusia need education and training in the craft. The artisans will also need education in the principles of business and marketing, in order to ensure that their products will turn a profit. Potters for Peace is an organization that could possibly partner with ACE in providing a ceramics education to the women of La Prusia, a connection with other potters, and advice on how to get started. By establishing this business, women in the area will learn technical skills and be exposed to networks and opportunities that they would not ordinarily be introduced to.

Not only will the women need instruction in the skills and techniques to learn how their ancestors made pottery, but they will also need to understand the justification for why they should make these chimneys and stoves. Educating the community on indoor air pollution and the cost of deforestation is essential to the successful integration of these stoves. The chimenea stoves must be well received by the community in order for this project to be sustainable. Local knowledge on the causes of respiratory illness and deforestation, as well as the benefits of the new stoves is necessary to the completion of the project. Workshops could be conducted by volunteers, informing the women of their

role in the community and encourage them to educate their young and family about these issues.

Education could persuade some, but this project will also have unforeseen flaws that could cause it to be unsuccessful or even build resistance. Before any project should be implemented, it is vital to get input from the people involved. Ideally, the workers will be enthusiastic about the project and feel like they have an active role in determining their future. Education and training in specific skills increases individual potential and power. However, problems will not be solved through general plans; there needs to be localized, tactical responses to specific issues (Ferguson, 1990). It is important to have a flexible outlook and not get 'married' to any specific expectations. The business plan needs to be adaptable and accommodate the people's needs as they arise. Therefore, there should be constant evaluation of the impacts of the project as it progresses.

Although plans change and the end result may be quite different from the original vision, it is important to have a clear goal at every stage of the movement. From the beginning, the mission has been clear: to promote empowerment, and poverty reduction through alternative sustainable development, more specifically for the families of La Prusia by way of utilizing a ceramics kiln. Some issues that will need attention throughout the progress of this project are: working conditions, fair wages, exploitation, self-empowerment and environmental and social sustainability. This will ensure that the project stays on track. The original concept of increasing local employment has now transformed and taken on aspects of local health concerns and environmental protection issues. This demonstrates the gigantic range of possibilities and positive impacts of alternative development programs.

### ***Appropriate Technology for the World's People***

The class setting of this project is a unique way to explore the subject of development and exposes students to problems faced in less developed regions. Ultimately the Cal Poly course *Appropriate Technology for the World's People* created a platform for creativity, inter-disciplinary exploration, communication, and a flow of ideas to help inspire this alternative sustainable development model. The availability of information and communication is a great asset to this project; on the other hand, being geographically separated from the site is still an obstacle.

The impact of globalization has greatly increased the connectedness of people around the world and has led to greater access to information and communication. Through this process, the world is becoming more exposed to different ideas, stimulating cross-cultural empathy. The social movement that questions the impact of industrial capitalism on the environment and people, especially in developing countries has increased individual interest in issues such as consumer power and volunteer tourism. *Appropriate Technology for the World's People* is an extension of this movement and increases students' global awareness.

Although it is impossible for Californians to truly understand what it is like to live in La Prusia, the research reveals some different facets of other people's lives and builds understanding. Being able to relate to someone in need creates motivation to find solutions. It is difficult as an outsider to say what would make their lives better or what is wrong, because they are of course doing everything in their power to best survive. However, the most valuable lesson is the awareness gained from exploring the subject matter. The research exposes some worldwide problems and the difficulty developers have in implementing change.

Inquiry into the history as well as the current political and social environment of Nicaragua uncovers a rich cultural heritage, but most of the research revealed the dire situation of poverty due to war, oppression and natural disasters. Awareness of the difficulty and complexity of these issues, as well as the dire need for change, has the power of encouraging action and influencing core values in individuals. Furthermore, knowledge from past projects brings examples of ways to relieve symptoms of poverty and empower the poor by allowing them the opportunity to invest in their own projects. In order to predict where this movement is going and how to make it produce positive change, one can draw from academic fields, which study these issues. Non-neoclassical, alternative development is the leading model for promoting sustainable growth and empowering impoverished communities, and *Chimeneas de la Esperanza* uses this strategy for its design.

The biggest difficulty of this project is not being on location. Paul Polak, a developer who is famous for his work with simple treadle pump irrigation systems in South Asia, has a list of "12 Steps to Practical Problem Solving." His first step is to go to

where the action is, and he encourages developers to talk to the local people and listen to what they have to say. Sometimes when dealing with a novel situation, it is easy to forget that another environment can have a different effect on the same input; therefore, one cannot use the same plan any place (Polak, 2009). So no matter how many case studies are examined, visiting the site and collaborating with the community is one of the most important things to the adaptation of a product and the success of developmental problem solving.

Access to multiple perspectives from fellow classmates and advisors adds to the projects momentum and scope. Advances in information technology have aided in the ease of communication and sharing of knowledge by means of the Internet. *Appropriate Technology for the World's People* is an effective class in that it allows students to connect with non-profit organizations around the world. Support from the development community is a huge asset. Potters for Peace, ACE, as well as experts in rocket stoves and development are readily available for email communication. Californian students can now more than ever be aware of situations concerning poverty in Nicaragua. On the other hand, Nicaraguan villagers are introduced to students from all over the world as well. Being conscious of the world as a global system relates to everyone and can help generate empathy and understanding. The connection with grassroots organizations developed through this process gives students greater opportunity to visit and work with NGOs in developing countries, as well as examples of people that have devoted their lives to making the world a better place. Not only did the experience give the students connections in the field, but it might also inspire some to participate in other development projects such as volunteer tourism. A Peace Corps volunteer also came and talked to the class about the organization and of the opportunities, which they have to offer students interested in development. Participation in the development of *Chimeneas de la Esperanza* has inspired some students to engage in humanitarian work. For example, Tiffany Nickles is planning a trip to India this summer to participate in efforts to help women and children escape human trafficking and sex slavery. She is partly inspired by the empathy and hope she gained through her experience in *Appropriate Technology for the World's People* and what she learned about the people of La Prusia.

The next step in implementing the goals of *Chimeneas de la Esperanza* would be to travel to Nicaragua to learn about the people, community and grassroots organizations working in the area. Hands-on experience is the most valuable form of research, and promoting new ideas to the local population is the only way to understand cultural responses and the real needs of the community. Personally, I feel inspired by the project and am not only extending it through my senior thesis, but I also plan to continue this research by visiting ACE.

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