Final Report

Solutions for the World's Poor:

Sanitation and Latrine Implementation in Peru

IPRO 325A

Fall 2009

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Table of Contents

Sanitation and Latrine Implementation in Peru

1. Executive Summary

The objective of IPRO 325 was to help the people in rural Peru. During their initial investigation, Team A found that a major problem in rural Peru was the lack of sanitation. After further research, the group decided to focus on the prevention of diseases rather than providing medication and healthcare. The focus on sanitation was based on the lack of toilets, or more particularly, the lack of latrines.

After this initial research, Team A looked more into successful latrines and possible problems related to the cost, ethics, and knowledge of sanitation. In this secondary research stage, the team contacted individuals in Peru to get more precise insight on the local situation and the problems of which they might not yet be aware.

Having analyzed the problem, Sub-team A focused on finding a solution that was both realistic and efficient. In this case, the most important part of the latrine design were the cost, ease of construction, safety, cleanliness, and ease of integration. This of course affected the way in which the design was thought out.

To make an efficient design, the team looked at the cost and availability of materials as a first concern prior to working on the actual design. The design was then made to work around the materials that were either unavailable or too expensive. This was all done with minimal sacrifice to the practicality and aesthetics of the design.

2. Purpose and Objectives

The purpose of IPRO 325, as mentioned, was to identify and address a current problem in rural Peru. After preliminary research and deliberation, the A Team decided to focus on sanitary conditions in Peru. A lack of latrines in rural Peruvian villages had led to the contamination of water supplies, spreading disease rapidly among the impoverished citizens. While Americans have enjoyed the benefits of vaccinations, medication, and easy access to doctors, inhabitants of third world countries have not have access to these treatments. While some organizations have chosen to attempt to provide medication for the poor, Group 325A sought to prevent disease before it occurred.

The problem of sanitation was two-fold; a latrine needed to be designed and built, and the community needed to be convinced of the need for improved sanitation. Historically, many organizations have had great success in developing practical and economical solutions to waste management in third world countries. However, the projects fell short in the implementation of the latrines. Societies that have survived without latrines for several centuries have not easily been encouraged to adopt this strange new idea.

This group sought to learn from past endeavors and address *both* aspects of sanitation. Projects from UNICEF, the Peace Corps, the World Health Organization (PHAST), GlaxoSmithKline (PHASE), and the IRC International Water and Sanitation Center (WASH) were all analyzed to determine what was done well, what was done poorly, and what aspects should be adapted into the project for Peru. One of the most influential precedents was the IPRO 325 project from the Spring Semester of 2008. The group from that semester designed a composting toilet and then traveled to Peru and implemented the latrine. While the design was scientifically sound, the cultural views of the community prevented them from handling the feces every one to two months, as was required by the design.

The community which this IPRO is targeting is the same as that which the Spring 2008 team targeted, the villagers of Sincape, Peru and the surrounding subsistence farmers. This location was chosen based on previous interaction between the villagers and Illinois Institute of Technology students, a suitable climate for the latrine design, and a need for latrines communicated by the community. In a report from a contact, Marisela Perez, it was made clear that the residents were lacking in sanitation. She stated, “People in Sincape no have any letrinas, they need it.” She continued on to describe the cause of failure of the previous project, “People want to change the compost toilet for another model. Customs and culture of the local people is making too hard to use on regularly”. (Appendix 1, Report of Sincape).

The technology and construction methods for latrines have been well established. Numerous designs have been made available online and through various sources and range from simple holes in the ground to restrooms with practically all the comforts of home. The design problem this IPRO addressed is the balance (in no particular order) of low cost, ease of construction, safety, cleanliness, and ease of integration into a society without latrines. From analysis of previous sanitation projects by the aforementioned organizations, it appeared that the creators of the latrine designs were not considering how the recipients would build the latrine and how they would react to the latrine. While it would have been tempting to try and recreate a modern restroom experience for the stakeholders of this project, the overall goal needed to be simplicity. For example, while a toilet stool and seat may have seemed like a necessity to Americans, the cost, availability, and sanitation implications of the design were not appropriate for Peru in this current time.

Indeed, one of the biggest problems this IPRO sought to address was the ethical implications of providing a latrine to the less-fortunate inhabitants of a village in Peru. If cost and time were not factors, the design would be safe by all professional standards, provide all the comforts possible, and be completely sanitary. However, time and cost were extremely important and were taken into

consideration. Ethically, the design may not have met the American standards dictated by professional codes of ethics and standard practices. By prioritizing each category, this IPRO addressed each aspect of the design and created an end product that was as safe, sanitary, and appealing as possible given the constraints.

By corresponding with the stakeholders of this project, the team gained even more insight into the ethical issues presented by this project. From Elizabeth Corson's e-mails with Marisela Perez (Appendix 2, Correspondence), it was revealed that a previous IPRO group that had visited Sincape had made some critical errors. Most likely due to time constraints, they had not completed thorough testing of their rocket-stove design. After the group had introduced their design and left Peru, the rocket-stoves they had built broke. There was no instruction manual, the group could not return to Peru, and the villagers were unable to fix the stove. This experience indicated that the new IPRO team needed to plan ahead for design failure and determine ways for the stakeholders to repair the latrine in the absence of the group. The second error was that students had promised the villagers that they would create a user manual for the rocket-stoves and return to Peru to deliver them. When no manual was produced and no return trip planned, the villagers felt like the students had broken a promise to them. This may have led to a lack of trust in future volunteer organizations that want to help Peruvians, and may prevent future advances in their quality of life due to this mistrust. This IPRO addressed ways in which this mistrust and miscommunication can be prevented to bring the greatest value of service to the community.

In conclusion, this IPRO sought to address the problem of diseases in Peru that are spread through fecal contamination of water sources. This problem was to be addressed through a two-fold plan of building a latrine and providing sanitation education. Ethical problems were also addressed, such as balancing cost and engineering standards of the latrine, the cultural implications associated with

human waste, and enhancing the relationship between the impoverished people of Peru and the organizations that wish to help them.

3. Organization and Approach

Organization

The A Team was organized according to the abilities of the individual members. Rather than assigning specific roles to each member, the team roles were flexible and changed throughout the semester. In this way, each team member's strengths were used for different tasks at different times. The team did not assign permanent administrative roles for the semester, such as minute taker or spokesperson. With a larger emphasis on progress and a much smaller emphasis on process, the A Team has been able to achieve more in their team meetings.

Needs Analysis

Initially, the A Team researched possible problems that needed to be addressed in Peru, particularly in rural Peru. Each team member chose a few areas to study and evaluate. They selected a few potential problems to focus on and analyzed what the benefits would be for pursuing any particular issue for the project. When this had been done, the team met together and discussed their findings. After a few meetings, the subject of the project had been narrowed down to addressing sanitation issues in rural Peru.

During the next stage of research, the team decided to look into what the principle sanitation needs of rural Peruvians were. It became immediately apparent that disease prevention was one of the most vital issues that needed to be addressed. They decided to start brainstorming about how the sanitation practices in Peru could be improved to drastically reduce the spread of infectious disease. After further discussion and research, it was decided that the construction of latrines (outdoor toilets) would have a significant impact on the current plight of the people there.

Project Plan

At this point, Sub-team A explored the internet and other resources, looking for existing latrine designs which might be used for their project. Many good designs were found, and the team compiled their information. In looking for possible design ideas, the A-Team also examined a project from a previous semester, which dealt with a similar issue. It was decided that a new design, incorporating many elements of previous designs, should be made. The main thought behind this was that the latrine structure should be able to be moved after the pit below it had filled.

The team felt that designing a latrine would be pointless if there was no plan for providing for the education of the people would be using the latrine. They agreed to produce educational materials, informing the users about the need for improved sanitation methods. In addition to this, they resolved to compile a construction manual to be used by the local people to construct the latrines from locally-available materials. To accomplish this, the team researched which methods would be most effective to convey this information. Elizabeth Corson and Nikolai Arendovich spearheaded this initiative.

In addition to this, the team decided that it was also important to initiate and maintain contact with people who either live in Peru, or have lived and worked there, in order to gain a better understanding of the culture and the status quo. Elizabeth started emailing a list of contacts, therefore, to achieve this objective. The information from the contacts, when it became available, was both useful and informative. The A-Team had to scrap some of their ideas and modify others based on the new, more accurate information that they received.

The remainder of the semester has been used to research and brainstorm about each aspect of the project. Each team member has worked on the topics of greatest importance or those most related to their respective fields of study. In this way, the diversity of the team has been utilized to its fullest, and the most important work has been accomplished.

4. Analysis and Findings

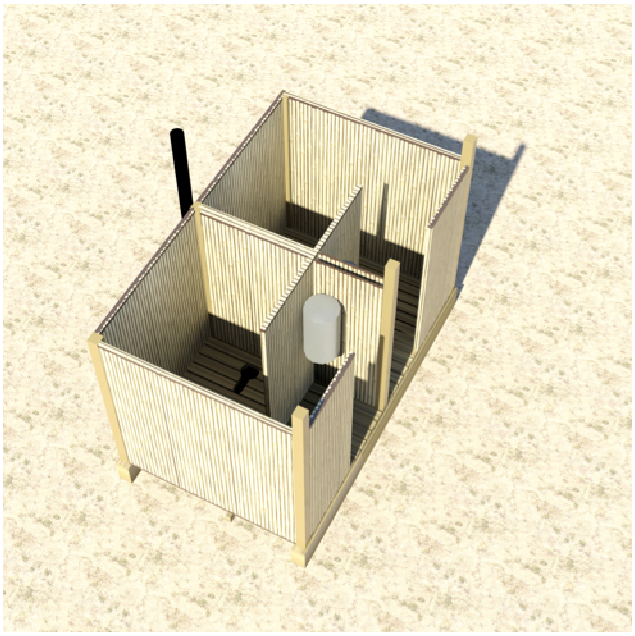
Analysis of the Problem

As mentioned before, Team A decided to pursue various topics related to the rural poor in Peru. This started with an analysis of the area. This involved determining what major problems were present in the rural areas of Peru. Beyond this was the origination and exchange of ideas which could be used to remedy this problem, or in their case, change an existing idea into something which would be more useful and beneficial to the stake holders. What they found was the prevalence of disease encompassing much of South America. From there, they determined how those diseases could be practically dealt with. The team decided to work on eliminating disease caused by a fecal to oral transmission, which is typically caused when fecal matter with bacterial, parasitic, or viral pathogens transfers from human wastes into the drinking water supply due to defecation in or around drinking water sources.

A joint monitoring program for water supply and sanitation was developed by The World Health Organization (WHO) and the United Nations Children Fund (UNICEF), which compiled data of Peruvian access to water and sewage for 20 years dating from 1986 to 2006. What they found was that 26% of the Peruvian population lived in rural areas. In those rural areas, only 65% had access to drinking water, and only 32% had access to sanitation. These facts immediately showed Team A a major practical obstacle that could be tackled; the improvement of sanitation in rural Peru. In doing this, the incidence of fecal to oral diseases would be greatly reduced due to the fact the proper placement of latrines would maintain a clean water supply. Hence, the concept of designing and constructing an improved latrine was born. This was somewhat ironic; one of the team's contacts in Peru told the team that a previous IPRO's toilet design had been a failure.

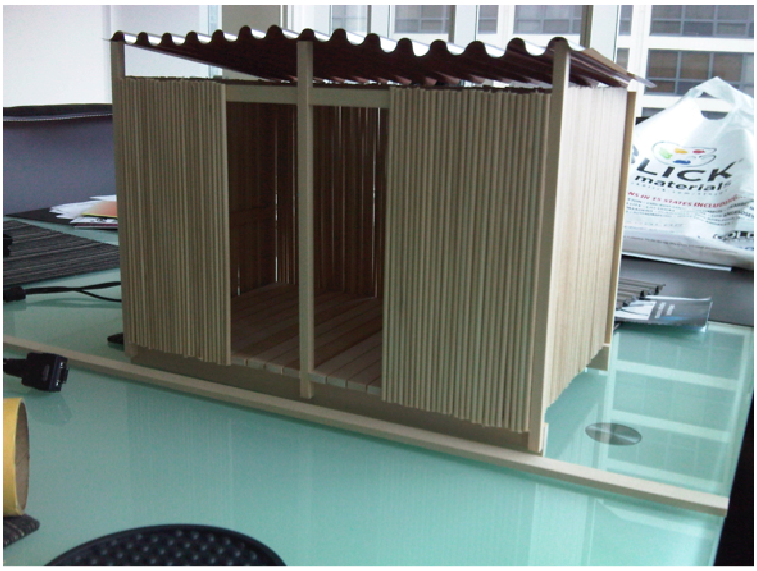
Formulation of the Solution

Figure 1 – Looking down on the latrine



At this point, the team began to consider how they might design latrines in such a way to best achieve their objectives. As mentioned earlier, there were many designs already being applied all around the world, so they began to take all the parts of the designs they thought were practical and economical, and incorporated elements of these designs into a new, more ideal design. They also took into account some of the cultural issues, which the team learned of from researching previous IPRO projects in Peru. An issue encountered in one of these projects was that women in Peru tended to drop out of school due to a lack of proper facilities. As the girls were growing up and maturing, they would desire a more private facility, and many would drop out of school because they were not able get the privacy there which they desired. With this in mind, the A Team determined that the best way to alleviate this problem would be to create gender-biased latrines which used the same pit. This was something that was not to be found in the research of other latrine designs. This design characteristic

Figure 2 – Photo of the scaled model



was incorporated with the hope that the amount of educated people in the area, especially future mothers, would increase with time, and in the long run benefit their society as a whole.

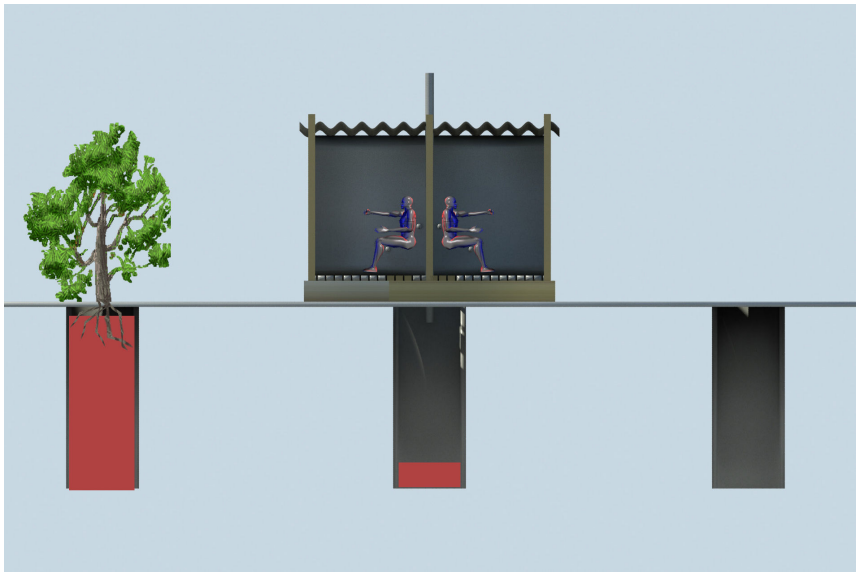


Figure 3 - After the initial pit is filled, the latrine structure is moved to a new pit. A tree can be planted over the old pit.

Design Highlights

It was determined that the best course of action would be to make a design in which the material could be made of whatever was readily available in the area in which the latrine was to be built. The plan was to make it primarily out of bamboo due to the fact that it grows naturally in the area, and grows rather quickly. This made the design itself much more economical. As for the inner "business" end of the latrine, the original design called for making a seating rig using pipes going across the interior. After more research into the current practices and customs in Peru, the team concluded that this idea would not be culturally or ergonomically feasible. As was found in the research, the indigent people are used to squatting, rather than sitting, when using sanitary facilities. After scrapping this idea, the A Team brainstormed and decided the best way to address this issue was to use a design which had already been implemented in other latrines around the world,

the keyhole. The keyhole was tailored in order to ensure that defecation, as well as urination, would all go completely into the hole.

The concept of a door was removed, as it would limit the airflow into the latrine, and a walk-in-and-turn was developed. This entrance design had two different turns, one for each gender. To ensure a more bearable smell, the inclusion of an exhaust pipe was implemented. This pipe would extend past the roof and would be painted black to absorb sunlight and generate heat in the tube. The heating of the tube would cause the air to exit the top, and pull the air from under the latrine near the hole.

The most innovative design element of the latrine was the mobility of the latrine structure. By building the latrine from lightweight material, the team made it possible for a few able-bodied persons to physically lift the latrine, and move it. In this way, the latrines could be moved to new locations over freshly dug pits when their current pits had filled. This resolved the culturally and sanitary dilemma of requiring the end-users to handle the fecal matter, as was required by the composting latrine designed by a previous IPRO 325 team. The used pits, having reached maximum capacity, could then be covered with a foot or two of organic soil, and a tree or shrub could be planted in that spot to make the greatest use of the fertile soil. Future plans involved creating hand washing bins within the latrine in order to improve sanitation overall. From online research, the team discovered that ashes or sand could be used for hand washing in lieu of soap, if soap was not readily available.

Education Plan

Beyond the actual design of the latrine, a lot of work had to be done in developing an education plan for the use of the people. This was of vital importance; if no one used the latrine, there would be no point in developing it. The education plan involved teaching people the importance of keeping waste away from water sources, as well as maintaining cleanliness to prevent the spread of disease. For a more hands on approach of teaching hand washing

techniques, the A Team purchased a small educational kit containing an Ultraviolet-active powder and lotion. The idea is to show that some things can't be seen, but still be there. This was a simple, hands-on way that could be used to show that various forms bacteria could be present, even if the hands appeared to be clean.

5. **Conclusions**

The solution that will best solve the problems related to poor sanitation in rural Peru is the construction of latrines (as mention in the previous sections above). By doing so, we will reduce the amount of diseases that are caused by fecal-to-oral transmission. The team has also been committed to making educational materials that will help rural people in Peru understand the importance of personal hygiene. There are three targets in mind for sanitation education. The primary target is going to be sanitation education for teachers. By targeting teachers, we target the future generations of the society, and with time, the entire population. The second target is the surrounding community, in order to explain to the general population the importance of improved sanitation, as well as the construction of the designed latrines. The final and most difficult target is the actual implementation of sanitary practices in schools and in the communities. These initiatives will be run by volunteers who are familiar with the area and people and will have no problem teaching the rural inhabitants of Peru. Much of the work done by the team has been preliminary, and future IPRO groups will need to follow up on this to see that it is all implemented.

6. **Recommendations**

The team has designed the project as a system of modules with the intention of laying the foundation for future teams in IPRO 325. The goal of the team for this semester is to establish the idea of the latrines in rural Peru. Once this semester is over, the project enters a new phase. The A Team has many recommendations for the future teams that will be a part of this IPRO.

The first recommendation for future teams is to gather information on the project that has been established in Peru and analyze the results. The idea here is to improve the design by understanding the analyzed results first. The team has thought of ways to improve the project and will leave those ideas for the future teams.

One of the ways to improve on the current design is to increase the usability while maintaining simplicity of the latrine by adding different parts to it. One part that could be very usable is a hand washing bowl. A designated hand washing area can also be established within the latrine. This area does not necessarily have to be a separate facility as that will increase the difficulty in building the latrine. The hand washing part can consist of a slightly bigger sized bowl that can be attached to a wall within the latrine. This bowl can also be connected to a water source that is perhaps available nearby, or the people could bring water with them when they go to use the latrines. The water bowl can also be connected to the hole to make sure no odors come up (perhaps with an S-bend) and to further increase the ventilation of the latrine. This will also reduce the amount of insects that gather around the latrine and provide a solid block for the odors from the pit. The water bowl addition increases personal hygiene, hygiene of the latrine itself, ventilation. The bowl can be made, or a bucket would probably suffice. The cost of the materials that would be used is low, as they are available in the area (hollow bamboo - used for canals from the water bowl to the pit), the effect of the latrine would be increased because the whole point is to eliminate fecal to oral transmitted diseases.

Another part that can be added is a compartment for storing rainwater. This stored water can be used either for hand washing by supplying water to the water bowl (mentioned above) and/or the latrine hole with a designed mechanism. Again, a bucket would suffice, and hollow bamboo can be used as the canals that would go inside the latrine and/or to the pit. These materials are available locally which basically minimizes the cost of this project and it further increases the efficiency of the latrine.

Not necessarily all the focus has to be on the improvement on the design, as the project was focused on a much broader perspective. Part of the project has an educational side to it, in order to inform and educate rural people of Peru in regards to the importance of hygiene and therein the use/need of latrines. Or perhaps a sustainable effective business plan can be established. There are plenty of business model alternatives that can be used to expand on the project. All the above mentioned alternatives promote the use of latrines, which will reduce the amount of fecal-to-oral transmitted diseases by improving personal hygiene, and therefore will increase the effectiveness of the whole project.

These recommended steps will require multi-disciplined teams. With that said, any of the recommended steps can serve as the next project for the coming IPRO teams.

APPENDIX 1 – TEAM MEMBER ROSTER

NAME	E-MAIL	PHONE	MAJOR
Nikolai Arendovich	narendov@iit.edu	[redacted]	Biochemistry
Paul Baulier	pbaulier@iit.edu	[redacted]	Architecture
Elizabeth Corson	ecorson@iit.edu	[redacted]	Chemical Engineering
Milos Leposavic	mleposav@iit.edu	[redacted]	Computer Science
Luke Miller	Lmille4@iit.edu	[redacted]	Mechanical Engineering

APPENDIX 2 – BUDGET

Wood model	$100.00
Germ-glow presentation kit	$80.00
Total	$180.00

APPENDIX 3 - REPORT OF SINCAPE

VISITING SINCAPE

To: Dr. Kenneth Schug

From: Marisela Pérez

Date: December 3rd 2008

On December 2nd 2008, I was in the Caserío of Sincape. I did some interviews to people who were involved in the projects of the first team of IPRO 325. They were so excited to know that a second team is coming back there. In them own opinions for them have haven the opportunity to meet student from another Country was a wonderful experience, where they have learned so many things. They cannot believe that in this short time they created very strong ties of friendship with everybody from IPRO 325.

To the questions about, if they are using the rocket stove, bioletrine and the artesanal refrigerator, them answer were…not yet. They have founded some problems about, and they want to the new team to improve this project in:

1. **ROCKET STOVE:**

   It is very fast to boiling water…only 5 minutes.

   PROBLEMS:

   - The problem is that stove turns to have very high temperature, and women and children at risk of accident to burn them hands easily.

   - The bean cans are destroyed very quickly, and they need to replace them with frequency.

   THEM SUGGESTIONS ARE:

   - Try to implement the system of combustion chamber of the ROCKET STOVE inside of the stove that they already have.
   - Use adobe bricks and bricks to built the stoves.


CRISTA
Deleite
Deleite
Kleenex

2. BIO – LATRINES or COMPOST TOILET:

People in Sincape not have any letrinas, they need it.

PROBLEMS:

- People want to change the compost toilet for another model. Costums and culture of the local people is making to hard to use one regularly

THEM SUGGESTIONS ARE:

- Another model of latrine, where they don't need to work with human feces.

3. ADOBE COOLING SYSTEM
People that it work very good keeping food from spoiling.

PROBLEMS:

- Moisture has caused the walls of the adobe cooling system cracks. The family is afraid that if they continue throwing water at the sand, the adobe cooling system can be destroy totally. (See pictures)

THEM SUGGESTION IS:

- Adobe bricks + cement are no good together. Maybe use ladrillo (brick) + cement or paint the walls with some elastomeric product (tersiflex) like a pool.

PEOPLE FROM SINCAPE ARE VERY GRATEFUL TO YOU ALL – IPRO 325 – , AND THEY ARE SO EXCITED THAT A SECOND TEAM ARE COMING BACK!

APPENDIX 4 - COMMUNICATION

To: Marisela Perez

From: Elizabeth Corson

Date: September 20th, 2009

Dear Marisela,

My name is Elizabeth Corson and I am one of the students in Professor Schug's class this semester, working on solutions for the world's poor in Peru. I believe he contacted you earlier this week concerning our project.

The group is divided into three sub-teams, each working on slightly different projects. The three projects are a house with improved thermal qualities, a roof design with practical applications, and a latrine design and implementation project.

I would love to hear more about your background and what type of support you could best contribute to our projects. We are most interested in cultural aspects of Peru, and how the problems we are tackling are viewed.

If you would prefer to converse in Spanish, please let me know. I am not a native speaker, but I have worked previously as a Spanish-English interpreter and I will try my best!

I look forward to hearing from you,

Elizabeth

To: Elizabeth Corson

From: Marisela Perez

Date: September 23rd, 2009

Estimada Elizabeth,

Es un placer escuchar que usted.
Creo que para nosotras podemos escribir en nuestros propios idiomas, usted puede escribir en Inglés y yo en Español, asi podremos expresar nuestras ideas en nuetros idiomas nativos con mayor facilidad.

Pues sí, profesor Schug me ha enviado algunos correos comentandome sobre los nuevos proyectos que ustedes tienen para Peru, lo cual me llena de alegría al saber que estan interesados en seguir ayudando a las familias con menos oportunidades en mi país.

En cuanto a mí, yo soy Medica Veterinaria que trabaja alrededor de 12 años en proyectos de desarrollo rural viendo el componente animal en el marco de estos proyectos. Bueno, tambien tengo experiencia en cuando a programas de capacitacion para adultos usando metodologias participativas. Mi ambito de trabajo es amplio, pues trabajo con diferentes ONGs en la costa, sierra y selva del Peru, ya sea en el norte o sur. Pues sabrá que la realidad del Peru varia segun el lugar geografico.

Me gustaría saber ¿si ya tienen pensado el lugar exacto donde van a desarrollar estos proyectos? ¿Cuando piensan venir a Perú?
Si hay alguna cosa en la cual ustedes creen que puedo ayudarles, para mi será todo un placer poder ayudarlos.

Espero tener noticias de usted pronto.

Best regards,
-Marisela-

TRANSLATION

To: Elizabeth Corson

From: Marisela Perez

Date: September 23rd, 2009

Dear Elizabeth,

It is a pleasure to hear from you.

I think that we should each write to each other in our own languages, you in English and myself in Spanish – that way we can express our ideas more easily in our own native languages.

Professor Schug has sent me several e-mails concerning the new projects that you have for Peru. It makes me very happy to hear that there is interest in helping the low-opportunity families in my country.

A little bit about me – I am a Veterinarian who was worked about 12 years on various development projects in rural areas looking at the animal component of these projects. I also have experience with programs for training adults using participative methodologies. My area of work is diverse, so I work with different non-governmental organizations in the coast, highlands, and jungles of Peru, both in the North and the South. As you know, what goes on in Peru varies a lot by geographic location.

I would like to know if you have thought about the exact location for your projects? When do you think you would come to Peru? If there is anything that you think I could help you with, it would be my pleasure.

Best regards,

Marisela

To: Marisela Perez

From: Elizabeth Corson

Date: September 24th, 2009

Dear Marisela,

Thank you for your quick response! I agree that we should write in the language that we are most comfortable with to better express our ideas.

The group that was looking at improved structure for houses is now thinking about an earthquake-safe design. They would like to find out what towns would benefit from this type of structure.

The group that was looking at an improved roof design wanted to focus on Sincape. Previous students who have worked with Dr. Schug have traveled to Sincape, so they have somewhat of an understanding for the area. However, they found that their original idea was not necessary for the area, so they are trying to think of a new project. A student who had traveled to Sincape previously said that a big problem was animals running away during earthquakes. Would this be a good problem to handle? Do you have any advice for this group?

My group is working on latrines, and we still need to pick a specific site in Peru. Do you have any suggestions? We are also developing an education plan for sanitation and latrine use, and we feel that this has a lot of cultural implications. What can you tell us about cultural practices or feelings that may affect this project?

Thanks,

Elizabeth

To: Elizabeth Corson

From: Marisela Perez

Date: September 29th, 2009

Hola Elizabeth,

Es un placer escuchar de usted y los proyectos.

Voy a responder debajo de cada parrafo:

The group that was looking at improved structure for houses is now thinking about an earthquake-safe design. They would like to find out what towns would benefit from this type of structure. Hace dos años atras se sufrió un terremoto en el departamento de Ica. Pero el Perú por la ubicación de las placas o fallas geológicas*, diferentes pueblos han sufrido terremotos en el pasado, y en estos lugares aun están activas estas fallas, y estas son: Nasca (Ica), Moyobamba (San Martin), Satipo y Huaytapallana (Junin), Tambomachay (Cusco) y la falla de la Cordillera Blanca (Ancash). En cualquiera de estos lugares ustedes podrian aplicar este proyecto.*

The group that was looking at an improved roof design wanted to focus on Sincape. En Sincape las familia aun estan esperando por ustedes, pues el grupo de estudiantes anterior prometieron que se regresarian con nuevos estudiantes. Pero aqui si me gustaría saber que paso con los proyectos anteriores. Pues el proyecto de las cocinas no han satisfecho las necesidades de los lugareños. El primer grupo de IIT en Sincape contruyó una cocina de metal y esta no funcionó. POsteriormente el segundo grupo de IIT en Sincape tambien contruyó una cocina de ladrillos que lamentablemente no funciona hasta ahora. la pregunta que se puede hacer aqui es si ustedes han pensado en corregir ese proyecto y hacer que estas cocinas funciones como prometieron? Pues entiendan que no se puede jugar con las expectativas y hacer talleres de capacitacion sobre algo que no funciona. Pienso que tienen que tener mucho cuidado con esto, pues sino la comunidad ya no responderá a nuevos proyectos y tambien está el prestigio de IIT dentro de la comunidad. HAsta ahora no se ha cumplido con los manuales que se quedo en enviar. Previous students who have worked with Dr. Schug have traveled to Sincape, so they have

somewhat of an understanding for the area. However, they found that their original idea was not necessary for the area, so they are trying to think of a new project. A student who had traveled to Sincape previously said that a big problem was animals running away during earthquakes.Como parte de la cultura de la comunidades en Perú, la crianza los animales no estan encerrados en corrales, sino que caminan por todas partes buscando su propio alimento, independientemente que exista algún temblor o terremoto.Would this be a good problem to handle? Do you have any advice for this group? si, tal vez deben enfocarse en el diseño de una buena cocina que realmente funcione en esta zona, y así la comunidad pueda ver realizadas sus expectativas. Conversando con ellos, la idea es pensar en un proyecto productivo que generen algún ingreso económico, como por ejemplo pequeños hornos para que ellos puedan deshidratar algunos productos agrícolas como el mango, papaya, naranjas, etc para su posterior venta y asi las familias generen ingresos.

My group is working on latrines, and we still need to pick a specific site in Peru. Do you have any suggestions? We are also developing an education plan for sanitation and latrine use, and we feel that this has a lot of cultural implications. What can you tell us about cultural practices or feelings that may affect this project? Estas refiriendote a las bioletrinas? las cuales usaran las heces como fertilizante. Bueno, aqui en las zonas rurales es dificil empezar a entrenar a las personas que usen solo sus propias heces para abonos como se trató de hacer en los primeros proyectos con el anterior grupo. Aqui tal vez pueden añadir a las letrinas un sistema para que funcione ademas un biodigestor, donde no solo se trabaje con heces humanas sino que estan sean mezcladas con las heces de los animales para que exista la probalibilidad que la comunidad al menos acepte la idea del proyecto. Claro que el diseño debe ser apropiado a la zona, usando materiales de la zona y sencillo para así puedan reproducirlo a otras familias.

Bueno, espero que esto les pueda ayudar en algo.

Si hay alguna duda o comentario me lo haces saber.

Best wishes,

Marisela

TRANSLATION

To: Elizabeth Corson

From: Marisela Perez

Date: September 29th, 2009

Hello Elizabeth,

It is good to hear from you and about your projects.

I am going to respond below each paragraph.

The group that was looking at improved structure for houses is now thinking about an earthquake-safe design. They would like to find out what towns would benefit from this type of structure.

Two years ago we experienced an earthquake in the Ica region. But Peru, because of it's location on the geological fault lines, different cities have had earthquakes in the past, and in these places there are some active fault lines. These places are:

Nasca (Ica State), Moyobamba (San Martin State), Satipo y Huaytapallana (Junin State), Tambomachay (Cusco State), and the fault line of the Cordillera Blanca (Ancash State).

You could apply this project in any of these locations.

The group that was looking at an improved roof design wanted to focus on Sincape.

In Sincape the families are waiting for you, because the group of students who came before promised that they would return with new students. This is why I would like to know what happened with your previous projects. The project with the stoves is not satisfying the needs of the citizens. The first IIT group to visit Sincape constructed a metal stove that is no longer functioning. After that, the second IIT group to come to Sincape also constructed a stove of bricks that lamentably has never worked. The question to be asked here is if you guys have thought about fixing these projects and making sure that these stoves work like you promised? Understand that you cannot play

with the expectations of the people and do workshops with something that doesn't work. I think that you should be very careful with this, because if you aren't the community will not respond to new projects and you might damage the reputation of IIT in the community. We still have not received the manuals that you promised you would send.

Previous students who have worked with Dr. Schug have traveled to Sincape, so they have somewhat of an understanding for the area. However, they found that their original idea was not necessary for the area, so they are trying to think of a new project. A student who had traveled to Sincape previously said that a big problem was animals running away during earthquakes.

As part of the culture in the communities in Peru, the animals are not closed in by pens, so they can walk everywhere looking for their own food, even if there is a storm or earthquake.

Would this be a good problem to handle? Do you have any advice for this group?

Yes, but I think you need to focus on the design of a good stove that actually works in this zone, this way the community can see your projects actually happen. In talking with the citizens, I think they would like a productive project that brings them a small income, like small stoves that you can use to dry various agricultural products like mango, papaya, oranges, ect. to sell and allow the families to generate income.

My group is working on latrines, and we still need to pick a specific site in Peru. Do you have any suggestions? We are also developing an education plan for sanitation and latrine use, and we feel that this has a lot of cultural implications. What can you tell us about cultural practices or feelings that may affect this project?

Is this in reference to the biolatrines? The ones that use the feces for fertilizer? In the rural zones it is difficult to teach the people that they should use their own waste to make fertilizer, as they tried to do in one of the projects of the previous group. Here maybe you could add to the latrines a biodigestor system, where it would not only work with the human feces but also could be mixed with the feces of animals so they at least have the possibility that the community will even accept the idea of the project. Of course the

design needs to be appropriate for the zone, using materials of the zone so other families can reproduce it.

I hope that this has helped you somewhat.

If you have any thoughts of comments, please let me know.

Best wishes,

Marisela

To: Marisela Perez

From: Elizabeth Corson

Date: October 8th, 2009

Hi Marisela,

Thanks for all the details!

I am new to this group, and unfortunately I do not know all of the details on the previous projects. I told Professor Schug about your concerns about the stoves in Sincape, and he is going to contact previous members of the group and see what went wrong and how it can be fixed. At this point in the semester we are unable to change our projects, but Professor Schug agrees with you and would like to try and re-focus on the stove project for a future IPRO.

For the latrine project, we are aware of the difficulty of using human waste as fertilizer. We were actually thinking of doing a project that targets villages that do not currently have or use latrines, or do not use them effectively. This would be combined with sanitation education.

Do you know of villages or towns in Peru that do not use latrines?

As for actual implementation, we are limited because the class is only a semester long. We want to learn from previous mistakes. Obviously there were issues with the stove project because the group members were not able to commit to more than one trip. Do you have any recommendations to overcome this challenge?

Thank you,

Elizabeth

To: Elizabeth Corson

From: Marisela Perez

Date: October 18th, 2009

Hola Elizabeth,

Siento mucho haber tomado mucho tiempo en responder su mensaje, pero solo ahora puedo sentarme con tranquilidad y leer su correo.

Entiendo que ustedes son nuevos en este grupo y que los proyectos que ustedes estan envueltos solo dura un semestre. Me alegra saber que el Professor Schug este pensando tomar nuevamente el proyecto de las cocinas con futuros grupos.

En cuanto a las letrinas, bueno la gran mayoria de las areas rurales en Perú no cuentan con letrinas, en pocos lugares el gobierno y algunas instituciones de la cooperacion international han construido las letrinas.

Cerca al caserio de Sincape, existen otras organizaciones de pequeños campesinos con quienes pueden trabajar nuevos proyectos y que tienen este problema. Sería interesante continuar este tipo de trabajo en un area similar a la de Sincape, pues ustedes conocen aspectos culturales y geograficos del area llamado 'Bosque seco' en la costa norte del Perú, que han sido percibidos por anteriores estudiantes de su escuela. Recuerde que el Peru cuenta con una gran diversidad cultural, geografica, medioambiental, etc. aun en areas muy cercanas, lo que muchas veces dificultaría el desarrollo de sus proyectos teniendo en cuenta el factor tiempo.

YA sabe que si tiene mas preguntas, por favor sientase libre de hacerlas.

Saludos para el Prof. Schug.

Estamos en contacto,

Marisela

TRANSLATION

To: Elizabeth Corson

From: Marisela Perez

Date: October 18th, 2009

Hello Elizabeth,

Sorry for taking so much time to respond to your message, but only now do I have time to sit down in peace and read your e-mail.

I understand that you students are new to this group (project) and that the projects you embark on are only for a semester. I am happy to hear that Professor Schug is thinking about revisiting the stove project with future groups.In reference to the latrines, the large majority of the rural areas in Peru do not have latrines. In some areas the government and various international institutions have made latrines.

Near the township of Sincape, there are other groups of subsistence farmers that you could work with on a new project and that have this problem (no latrines). It would be interesting to continue this kind of work in an area similar to Sincape, since you are already familiar with some of the cultural and geographical aspects of the area called "Dry Forest / Bosque Seco" in the north coast of Peru, as have been previously seen by students from your university. Remember that Peru has a lot of diversity in terms of culture, geography, environment, etc, even in areas very close to each other, which many times makes it difficult in the development of your project given your time constraints.

As you already know, if you have more questions please feel free to ask them.

Greetings to Prof. Schug. Let's stay in touch,

Marisela

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