PARTNERSHIP FOR CLEAN INDOOR AIR

April 2008 Issue 15

PCIA Bulletin

This quarterly newsletter provides updates on the activities of the Partnership for Clean Indoor Air (PCIA) and its Partners to improve health, livelihood and quality of life by reducing exposure to indoor air pollution, primarily among women and children, from household energy use. More than **170** governments, public and private organizations, multilateral institutions, and others are working together to increase the use of affordable, reliable, clean, efficient, and safe home cooking and heating practices. *Visit www.pciaonline.org to join!*

This issue of the PCIA Bulletin is the second in a series dedicated to reporting on some of the tremendous accomplishments of PCIA Partners in specific regions of the world. This first issue in this series, Bulletin #14, presented some of the many important activities and achievements underway by PCIA Partners in Africa. This issue focuses on significant developments in Latin America and the Caribbean. Bulletin #16 will highlight activities in Asia.

In this issue you will find six spotlight and feature articles on Partner results throughout Latin America and the Caribbean, a Notes from the Field missive from El Salvador, two recent Partner activity updates from Brazil and El Salvador, regional-focused Resources under "What's New" and our fact box highlighting PCIA Partners and events in the region.

Partners in Latin America and the Caribbean are building their skills and programs through participation in workshops and trainings; producing, testing, and selling or otherwise disseminating stoves, solar cookers and retained heat cookers; publishing papers and manuals; exchanging information; scaling-up activities; and raising awareness on issues of indoor air pollution and health. If you know of other organizations in the region doing this important work, please let us know so that we can help connect them to other local Partners and share the latest in resources and technical guidance and assistance.

As always, we welcome your feedback, including suggestions for future Bulletin themes, and urge you to share your own experiences through future issues.

Save the Date!

The 2009 PCIA Forum will be held in
Kampala, Uganda
March 24- 28, 2009

More information about the Forum will be published in a future issue of the Bulletin, and on the PCIA website at www.pciaonline.org

In This Issue

PARTNER SPOTLIGHT Sun Ovens International

Each quarter, the *PCIA Bulletin* highlights one or more Partners who are reducing women and children's exposure to indoor air pollution. This issue highlights the activities undertaken by Sun Ovens International.

Paul Munsen, Sun Ovens International; info@sunoven.com

Haiti is one of the world's most deforested countries. In some parts of Haiti, families spend up to 55% of their household income to buy charcoal. It is not uncommon for women to face the dilemma of choosing between buying enough food to feed their family or the charcoal to cook it. To maximize the charcoal's value, much of the cooking is done in enclosed kitchens, exposing women and children to the harmful effects of smoke. Sun Ovens International (SOI) has been working in Haiti since 1997, and is committed to providing an alternative to cooking with charcoal. Haiti is blessed with an abundance of sunshine; the sun can be harnessed as the fuel source for up to 70% of household cooking.

The challenges to implementing solar cooking projects in developing countries like Haiti relate primarily to cultural concerns. SOI studied the cultural issues which prevented widespread acceptance of the sun as a viable cooking fuel source. The two primary reasons solar cooking projects in Haiti had failed are:

- Haitians eat their evening meal after sundown. Food cooked in most solar cooking devices must be consumed immediately, or it will become cold.
- Many solar cookers require much more time to cook than cooking with charcoal, requiring women to substantially alter their daily schedules.

Haitian beans and rice sunning themselves

To help overcome these cultural challenges, Sun Ovens were designed to be well insulated, allowing food cooked in the afternoon sun to stay warm until it is ready to be consumed in the evening. The Sun Oven was also designed to cook in the same amount of time as cooking over traditional three stone fires, and to accommodate cooking both beans and rice at the same time.

Unfortunately, making a solar appliance women will use for the majority of their cooking involves cost. Haiti is the poorest country in the Western Hemisphere, with 80% of the population living under the poverty line and 54% in abject poverty. SOI's research indicated that regardless of the cost of a solar cooker, the majority of Haitians could not afford to purchase one. To address this issue, a revolving loan fund was established to enable women to obtain a Sun Oven and pay for it over time using money otherwise spent to buy charcoal.

Sun Ovens being assembled in Lambert Haiti

An average family spends $2.30 (U.S.) per week to purchase charcoal. A Sun Oven can be used for 70% of their cooking and will save an average of $1.61 a week in charcoal expenditures. Weekly payments are set at $ .97 (60% of the savings); the remaining $ .64 per week creates an incentive to solar cook and takes money that literally was going up in smoke, distributing it through the local economy.

Initially, the challenge of implementing this system was that women in Haiti live very much

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one day at a time and even though they saved a high percentage of their income by using a Sun Oven, they rarely had a long enough view to understand that they were saving money. To overcome this problem, cardboard solar panel cookers were introduced. Women received 3 days of training centered around the construction of a cardboard solar panel cooker, the principals and concepts of solar cooking, and the frailty of the Haitian environment. The training occurs over lunchtime, and the first two days, Haitian foods are cooked in Sun Ovens and served for lunch. On the third day, a solar potluck is held. Each student prepares food in their own cardboard cooker and shares it with fellow trainees.

As part of the training, participants receive a log allowing them to document the use of their cardboard cooker and the amount of money they saved by not using charcoal. Participants who use their solar panel cooker on sunny days, for 90 days or longer, can use their log as a down payment on a Sun Oven. The Sun Ovens cook food much faster and can be used to cook the evening meals. After 90 days of documenting the use of the cardboard cooker, women have a much better understanding of the financial benefits of cooking with the sun and are eager to agree to a payment plan to obtain a Sun Oven.

In a project funded by Rotary International, SOI has partnered with a school in Lambert, Haiti to establish a plant to assemble Sun Ovens. Over time, further cost reductions will be obtained by utilizing locally manufactured component parts. Producing Sun Ovens in Haiti will sufficiently decrease the shipping costs, and using Haitian labor for production will create jobs in Haiti and reduce the overall cost of each oven produced. To date, 700 Sun Ovens have been made in Haiti and a total of 2,600 Sun Ovens have been distributed. More information on Sun Ovens International is available on their PCIA Partner profile at www.pciaonline.org or here.

☼ NOTES FROM THE FIELD

Nancy Hughes, Stove Team International
nancyineugene@yahoo.com

If you had been with me in December, and you were here with me now, you would know it is a miracle! When our team of 8 volunteers arrived on the 6th of December we encountered a bright, dedicated Salvadoreño and a house with a nearly empty and overgrown back yard. Some of the land had been cleared by a team of oxen and a shelter of corrugated metal had been erected to protect the people Gustavo Peña had hired to make some prototype stoves.

Gustavo proceeded to introduce us to the Vice Minister of the Environment, Directors of FIAES, Habitat for Humanity and others. We spent a busy week planning how to increase factory production and give incentives and directions as to how to improve the stove design.

We returned in March with a team of 29 volunteers to see what we could do to help. The team gave stove demonstrations in the community, helped start the construction of a brick wall to protect the factory site, and build a desk, a few workbenches, and expand the covered area in the yard. The team members returned home satisfied that they had been the start of a grand experiment to help someone in El Salvador start his own business, others to gain employment, and many to receive stoves that would not only improve their health but help with the problem of deforestation and pollution.

Yesterday, when Don Steely and I returned to the factory site we were absolutely blown away! The factory with a large StoveTeam International sign out front was up and running with 10 permanent employees, a number of temporary employees, and an enormously expanded facility. This all happened in less than 5 weeks! There is now an office, nicely painted and with pretty curtains, where there is a computer expert, a secretary, and someone to receive payments and distribute the stoves. The tools have been individually photographed and inventoried by date received. There are official invoices for the stoves and there are banking procedures in place.

Out in the yard the work area has been expanded to twice the size, and there is a work area covered by blue tarps where two women are filling the stove bodies with pumice and finishing the tops. Each employee has his or her own designated tools and many of the tools have been redesigned or custom designed to make the job easier. The

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stove body is not only cut with a plasma cutter, but one of the employees designed a stand with a ring magnet to hold the steel in place to make cutting easier. The bead roller has been attached to a post to make the job of finishing the edge easier. Tools for bending the parilla have been designed and produced by Gustavo. The employees have been divided into teams working together to make all of the jobs more efficient. A ten year old boy comes each morning to clean the site in return for having his school fees paid by Gustavo.

Production is up from 100 per month to 1,000 per month in five weeks, and there is still room for additional workers. Each employee wears protective equipment, fans have been installed, respirators put into use, and painting is now only done on Saturdays to keep fumes from contaminating the others.

Don and I met with attorneys and accountants yesterday and will be making decisions this week as to how to proceed. In the meantime we have had meetings with various governmental and nongovernmental organizations who are increasingly more interested in our project. Yesterday the members of San Salvador Rotary came to the factory and were also so impressed they are having a special meeting to see about redesigning their program to help. The governmental organization in charge of bettering the lives of women took all of our information and they hope to include the stoves in their house production program. And, to top it off, last night we received a call asking for another 4,000 stoves!

Today we are meeting with another Rotary Club from Santa Ana, visiting a bilingual CPA, checking out hotels and transportation for future volunteers.

Tomorrow is the CARE demonstration to prepare for the Warren Buffett delegation. Warren will not be coming in late May, but will be sending an advance team to check out the site where CARE is working. It is five hours across El Salvador from the capital and is supposed to be the hottest area of the country. We'll be ready to go at 5am and happy to show off our stoves.

In addition, we will be stopping to investigate two potential sites for factories in that area and will return to San Salvador to pick up Marco Tulio from the bus station so he can work with us in the factory in Sonsonate and decide if he wants to work with us in Guatemala.

The three days spent in Guatemala were extremely productive as we now have two or three people from there who are interested in starting factories, and one will be here on Friday. Also, I met with a film crew there that is interested in producing a documentary on our project. We have possibilities of much more publicity, but our attorneys have advised us to wait until we get our legal processes in place before doing too much, so we have cancelled today's television appearance and put it off until early June when we return.

So all is well with StoveTeam International and Don is busy tweaking some last minute changes to the latest stove model. Martin, our fabulous Peace Corps Volunteer, is contemplating spending a couple of years working with us in a special project funded by the government. They would pay all of his expenses if he decided to stay. We would be more than thrilled to have him!

When the next group arrives in late May we will not only be working with stoves and the factory site or sites, but will be bringing a mobile dental unit to go out into the villages on weekends to do dental care. We have one dentist here and one from the USA to start the project and our local dentist is contacting others to help.

We're more than off and running... and we're hoping you can come and join us soon. Our next scheduled trip is in November 2008. Please come!

Nancy

Your comments are welcome!

This newsletter is published by Winrock International on behalf of the Partnership for Clean Indoor Air. To share comments, suggestions, news, and article contributions please email PCIAonline@yahoo.com. The deadline for contributions to next quarter's Bulletin, the topic of which is Partner activities in Asia, is **May 30, 2008**.

☼ FEATURE ARTICLES

Sustainability Strategies for Improved Stove Projects in High Andean Peruvian Communities Dante R. Diaz Vásquez, Coordinador, Centro de Ecología y Genero (Centro ECO); ddiaz@centroeco-peru.org

With financing from USAID, and in conjunction with Winrock International, the Centro de Ecología y Genero (Centro ECO) executed a "Healthy Kitchen" project in the high Andes of Peru. The objective of the project was to improve health and environmental conditions in 16 communities from the Inkawasi district, through the implementation of improved stoves, organizational strengthening, and capacity building for local communities and organizations. The project is built on a previous GTZ-funded pilot project in Ayamachay, as part of which a local "Inkawasina" improved stove incorporating rocket design principles was developed in consultation with local women. The Inkawasinas, now also used in the project described here, are made from locally-available raw materials.

One of the main goals of the project was the adoption of 600 Inkawasina stoves. During implementation we faced many challenges including weather conditions, difficult topography, and villagers' hopes that the stoves would be distributed for free, which was not the case. Due to the extreme poverty in these communities it was almost impossible for most families to afford the full cost of an improved stove (100 Nueva Soles, which is ~$US30). At the same time, we did not want to give the stoves away due to concerns that they would not be valued by users. Thus we adopted an animal husbandry-based micro credit strategy which consisted of training families to raise and sell small animals, including ducks, chickens and guinea pigs, all of which (including duck and chicken eggs) are eaten locally. Families were given an animal module consisting of one male and five females on loan. By breeding and selling these animals, they were able to buy an improved stove, pay back the initial loan including interest, and keep breeding the animals for additional income generation. Due to a short project timeline, some families were given the improved stoves on credit simultaneously with the animal modules. The interest on the loans supports local Environmental Health Associations (AGESAS) charged with expanding the project and ensuring its sustainability. The AGESAS also oversee and administer the micro-loan fund, and is comprised of Environmental Health Committees consisting of local leaders and trained promoters charged with educating the public about indoor smoke, improved stoves, and related behavior and environmental health issues.

By the end of the project implementation period in September 2007 about 380 improved stoves had been purchased and installed and more than 400 animal modules had been distributed on loan. Since then project activities have continued without external funding. By March 2008 the AGESAS had supported the adoption of about 700 improved stoves, and loans of more than 800 animal modules. This continued success demonstrates the sustainability of the project, which relied on local organizations, developers, and community leaders influencing their neighbors and friends about the importance and benefits of the improved stoves.

Inkawasi family with new stove

One noteworthy project outcome is the reduction in fuelwood consumption after improved stove adoption. The burden of fuelwood collection has been reduced, as consumption has been decreased by more than 50% on average. Variations exist between the sites primarily due to the number of people per home and willingness of cooks to dry firewood before burning it in the improved stove.

Indoor air pollution monitoring within 12 months of stove installation showed that indoor concentrations of respirable particulate matter (measured as PM_4) and carbon monoxide (CO) were reduced by more than 80% in a large majority of households.

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In working with families breeding guinea pigs, Cento ECO has placed an emphasis on consumption over sales alone in order to improve the family diet and chances of replicating such breeding programs within the communities. Even so the establishment of a strong productive chain, especially for guinea pigs, was necessary. We searched for customers who were willing to pay a higher price for the guinea pigs produced in rural communities, and established a commercial alliance with the noted Marakos Restaurant in the town of Chiclayo. They added a special dish to their menu to promote the consumption of guinea pig, which they now buy directly from the AGESAS.

Activities were also conducted to strengthen the AGESAS' abilities to train local health committees in accounting, production, and business management. While AGESAS are responsible for ensuring the sustainability of the project, they are now also expanding their activities to forest plantations and home gardens as part of efforts to preserve the environment.

With this local development methodology described here Centro ECO together with local organizations has installed more than 1000 improved stoves in the rural communities in the north of Peru. Centro ECO is now working with various national companies to provide stoves to workers as part of corporate social responsibility activities. One of these companies is the Empresa Agrica San Juan, which is part of the first group of exporters of Peruvian organic coffee. Beginning in August 2008 Centro ECO will be working to provide stoves to the company's 1000 workers over the next three years.

Centro ECO Healthy Kitchen coordination office

Energizing Development: Access to Modern Energy

Klas Heising, GTZ Bolivia, klas.heising@gtz.de

Biomass for cooking is still the dominant energy source in rural areas of Bolivia. For logistic and economic reasons, a massive shift to cleaner fuels such as liquid petroleum gas (LPG), natural gas (NG), kerosene and alcohol is unlikely in the near future. Due to high altitudes and a resulting rough climate, women often cook on the floor with a three-stone or shielded open fire in rooms with very poor ventilation, resulting in high levels of indoor air pollution (IAP) and thus IAP-related health issues.

In the fall of 2005 GTZ Bolivia launched the project "Energizing development: Access to modern energy", co-financed by the Dutch government (DGIS). Its goal is to enable access to modern energy for as many Bolivians as possible, with at least 570,000 beneficiaries by Dec 2010.

There are 4 lines of work:

- Energy for illumination - grid densification; mobile solar appliances/lamps
- Energy for cooking - biomass stoves for households and institutions; connection and installation of natural gas appliances for schools
- Energy for social infrastructure (schools, health centers) - photovoltaic systems; solar water heating; connection and installation of natural gas appliances for schools
- Energy for productive uses - crop transformation; micro irrigation; biogas

So far, in the second line of work above, we implement 3 strategies for biomass stove dissemination in parallel:

- Strategy A: dissemination of off-the-shelf stoves (linked more and more with microcredit)
- Strategy B: complementing existing projects and programs with stoves through strategic alliances
- Strategy C: training of local stove builders who are hired by families

In the Andes, we usually work with two pot chimney stoves in order to efficiently evacuate IAP. Chimney stoves are not as cheap and transportable as simple one-pot rocket stoves. Manufactured off-the-shelf two-pot chimney stoves can be too expensive for many rural

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families while marketing, logistics and after-sale service in scarcely inhabited areas appear to be too costly to sustain manufacturers without subsidies. Hopefully, the off-the-shelf stoves will establish themselves in periurban areas and small towns, especially if combined with a microcredit scheme.

In the meantime, the challenges of off-the-shelf stoves lead us to promote building mud/adobe stoves in family homes in areas with no other market alternative so far. Encouragingly and contrary to experiences in India, there is evidence in Bolivia that stoves that are more similar to traditional stoves are better accepted than industrially manufactured metal stoves.

Malena stove in outdoor patio

Since Bolivia has a variety of climate zones with different biomass fuels, we developed different versions of a mud adobe stove named "Malena." The stove was adapted accordingly: a version for the tropical lowlands, another one for the valleys and a third one for high altitudes, optimized for the use of cow and lama dung as well as shrubs. In addition to the usual rocket chamber for shrubs and cow dung, the highland Malena stove has a 45 degree feeder tube that directs the fall of 9mm diameter lama dung pellets to the right place. It also has a special grate and ash trap in order to guarantee continuous air flow. This multi-fuel combustion chamber design was developed by a Peruvian engineer in a partner GTZ project and successfully incorporated in Bolivia.

In order to reach families in poor rural areas, we train local installers who are paid for their services by customer families, usually US$4-10, depending on local fares. The families provide local material such as adobe bricks and mud. GTZ subsidizes non-local materials (chimneys, grates) and provides support for supervision, awareness and social marketing. When possible, chimneys and grates are produced in small workshops close to the installers.

We create local markets for stove builders by training installers on the supply side and creating demand by raising awareness through social marketing. With this demand driven approach, coverage well above 50% has been achieved in some poor districts.

We hope that once the improved stoves are established and the subsidy ended, families will continue to hire local stove builders and shoulder the cost for the external material. A grate and chimney in Bolivia cost US$7-10. When substituting the metal chimney entirely with adobe bricks (not recommended in some regions with recurrent seismic activity!), this additional cost might be reduced to US$3. This seems reasonable if the stove is perceived as useful by the families, if there is a minimal purchase power and if the area is not spoiled by too many give-away activities of NGOs, government and international agencies.

All the stoves promoted are tested thoroughly in the laboratory and in the field by the Stoves Testing Center of the University of San Simon in Cochabamba. The mud adobe stoves have reached a very satisfactory performance, boiling 5 liters of water in less than 20 min, using less than 18,000kj of energy to finish the WBT (the benchmark for two-pot chimney stoves proposed by Aprovecho is 30,000kJ) and if used correctly almost completely eliminating IAP.

The implementation is accompanied closely by monitoring using structured interviews and observations as well as Controlled Cooking Tests (CCT) with IAP metering. GTZ applies a similar approach in the Southern Andes of Peru.

Certified stove installers in the Altiplano

Latin American Partners Strengthen Their Programs in Two Key Areas

Brenda Doroski, U.S. Environmental Protection Agency, doroski.brenda@epamail.epa.gov

Over the last four years, more than 40 Latin American Partners have participated in PCIA regional workshops to learn new skills in monitoring and evaluation, stove design and performance, and commercialization of their stove programs. These workshops have resulted in more data available on the performance of innovative technologies and the impact of interventions throughout the world; robust business strategies with which to evaluate, roll out and monitor household energy programs; and commercially viable markets for improved technologies.

Ultimately, the combined effects of these capacity building efforts will lead to improved health, family economics and quality of life; and reduced poverty and impact on environment throughout countries in Latin America.

Monitoring the Impact of Interventions

In May 2005, 28 Partners from 7 Latin American countries developed monitoring plans during a Partnership for Clean Indoor Air regional *"Indoor Air Pollution and Household Energy Monitoring"* workshop in Antigua, Guatemala. The workshop was conducted in English with simultaneous Spanish translation. During interactive and hands-on sessions, household energy and health experts learned how to monitor indoor air pollution (carbon monoxide and particulate matter), health and well-being impacts, stove performance, and socioeconomic impacts of their household energy interventions. One participant particularly appreciated "the variety of participants, trainers and different perspectives (NGOs, governmental agencies, researchers)." The workshop was cosponsored by the U.S. Environmental Protection Agency, World Health Organizations, Center for Entrepreneurship in International Health and Development, and Aprovecho Research Center. Guest speakers presented case studies on various monitoring and evaluation initiatives in Latin America. A booklet and CD-ROM of the workshop materials is available upon request to PCIAonline@yahoo.com.

Conducting a water boiling test

Commercialization Workshop Participants

Commercialization

In June 2006, 15 representatives from six NGOs participated in the first in a series of regional commercialization workshops, this one held in Patzcuaro, Mexico to develop commercially viable household energy projects in Mexico, Honduras, and Nicaragua. Accenture Development Partnerships conducted the workshop based on the fundamentals of the Commercialization Toolkit that they developed and field tested for the Shell Foundation. The workshop resulted in an increased understanding of commercial considerations and tools available to strengthen the commercial aspects of stove programs. One workshop participant reported "the workshop helped us consolidate our field experience, and organize the steps we need to take to operate more efficiently." For more details please see the article on this event in Bulletin #8.

Conclusion

Participant feedback from these workshops indicated that participants appreciated the hands-on, participatory workshop format, and found the interaction and networking with other regional experts essential in identifying solutions and effective approaches for their individual stove

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programs. The Partnership for Clean Indoor Air will continue to provide Partners with regional training opportunities to strengthen vital components of their stove programs. If you would like to co-sponsor a regional workshop, please contact us at PCIAonline@yahoo.com. Visit the PCIA website at PCIAonline.org for information on upcoming regional workshops.

New Funding Awarded for Scale-up Project in South America

The U.S. Environmental Protection Agency (USEPA) recently competed and awarded cooperative agreements totaling approximately $1.3 million to six highly capable household energy and health programs in Africa, Asia and South America that have successfully produced commercially viable cooking and/or heating technologies. These projects will significantly increase the availability and use of affordable, reliable, clean, efficient and safe home cooking practices through the scaling up of already sustainable manufacturing and delivery systems.

All awardees successfully met program requirements by demonstrating that their proposed technology to be scaled up 1) reduces people's exposure to particulate matter and carbon monoxide by a minimum of 50%, and reduces fuel use by a minimum of 30% over current local practices; 2) meets the needs of the target population (e.g., is affordable, reliable, clean, efficient, and safe); 3) provides a social benefit (e.g., has a positive impact on health, local employment and income generation, environment, and/or family finances); and 4) utilizes a financially sustainable business model.

One of the scale-up projects is located in Latin America and is described below. Descriptions of the Africa projects can be found in PCIA Bulletin #14, and the Asia projects will be discussed in Bulletin #16.

What Does an Iceberg and Cellular Phones Have To Do with Clean Burning Stoves?

David Whitfield, Director, CEDESOL, david@cedesol.org

This is an exciting time for CEDESOL as we are looking to build on the progress we made in 2007 and preparing to make a much greater impact in 2008. One way in which we will be able to achieve our goals for this year is through a cooperative agreement with the United States Environmental Protection Agency (EPA).

Under this cooperative agreement, CEDESOL will scale-up the industrialization process for a uniquely designed wood-burning rocket stove, which is part of our group of Ecological Cookers (a well-sealed solar box cooker based on the ULOG type solar cookers[1], retained heat cookers and the two-burner rocket stove with chimney). Major improvements are being made in the production process so that 2,000 of these stoves will be produced every month, compared to 300 or 400 per month before the scale-up.

The stove is fuel efficient, does not pollute the environment and gets about 95% of harmful gas particles out of the living space. Our goal is to deliver 20,000 stoves by mid-2009, thereby impacting sizeable cultural change and improving the lives of a significant sector of the population. Stoves will be sold countrywide through 30 certified regional businesses and NGOs, directly benefiting 120,000 people, and made affordable through industrialized production techniques and appropriate micro-credit schemes (one micro lender is already making loans, programmed so

Ruth Saavedra de Whitfield demonstrates the 2 burner rocket stove for representatives of 75 communities in Santa Cruz Bolivia

that when the stove is paid off, the lender has a savings account started in the amount of the monthly payments!). Aprovecho Research Center of the USA is providing technical assistance to ensure quality assurance. We expect this 20,000 to be just a launching point for supplying the large

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need for improved household cooking in Bolivia as well as its neighboring countries.

Since the beginning of our project with EPA in September 2007 we have found that what we planned for was like the tip of an iceberg; two-thirds or more lay below the surface. Our plan consists of education, consumer awareness, retooling of the fabrication, modification of the stove's appearance and assembly process, a distribution system, a spare parts replacement system, financing stove sales through micro-credit, and incorporating carbon credits to help mitigate the constantly rising costs of our materials.

In December we determined that during 2006-2007, 58% of our stove sales were for our solar cooker manufactured by the Bolivian micro enterprise Sobre la Roca. Surprisingly, solar cooker sales have continued strongly even during the rainy season, which is just ending in Bolivia. By working with improved wood burning stoves, insulated cookers and solar cookers, we are working with what is called an integrated approach to improved household cooking. When all three technologies are employed, this integrated cooking system has demonstrated an average fuel reduction of 85% in addition to significant indoor air pollution (IAP) reduction.

The first phase of our "place-based education" program has been completed, and from that a radio drama was developed, first produced in Quechua, the main native language. The radio drama was tested in a very rural area in North Potosi and we were overwhelmed by the response. In Bolivia, most rural people listen to the radio, making it a more effective medium than TV.

In March CEDESOL began airing the program in Quechua in the state of Cochabamba, the heart of Bolivia. Again, the response was exciting as the radio stations said they were flooded with calls asking for the same program in Spanish. Our twice monthly appearances on a popular news magazine show and 30 second TV spots have helped increase awareness. Groups and growers associations from around the state have started coming by and asking for the broadcast material to air in their locations. Over the two-year project period, an estimated one million households will be educated about IAP consequences and interventions.

As has been seen in the proliferation of cell phones in every economic bracket, even the poorest of individuals can afford a "luxury" such as an efficient and clean-burning cook stove. By working on both ends of the equation, bringing down the cost of the product and raising awareness of the technology's benefits, we expect to create a significant demand for this much-needed cooking technology.

Getting the plasma cutter and CNC table set up and running was quite a learning curve!

Two important things have quickly become clear to us. First, the socialization related to our ecological cookers (helping folks identify the reasons our stoves are essential for their lives) will require the most work and preparation, much more so than producing the "best" product. Like the iceberg, there is so much more than is immediately apparent that must be taken into consideration. Second, once people decide they need our stoves like they perceive they need the "luxury" of a cell phone, our sales goals will be achieved.

This program will be made sustainable through its partnership with the Bolivia national government, GTZ, the University of Bolivia, local and national NGOs, a carbon credit program, private businesses and micro loans to consumers as a component of a national 100,000 Smoke Free Homes initiative. The success of this project will provide lessons for replication in other South American countries. For more information on CEDESOL please visit www.cedesol.org.

Notes

1: More information available at http://solarcooking.org/papevar2.htm

☼ HAPPENINGS

Recent Partner Activity…

Dissemination of Efficient Cook Stoves in Brazil: A challenge to curb respiratory infections and reduce fuel wood consumption

Jörgdieter Anhalt, IDER-Instituto de Desenvolvimento Sustentável e Energias Renováveis, Brazil; anhalt@ider.org.br

In Bulletin#10, January 2007 we described our early efforts to establish a dissemination program for efficient cook stoves in the northeast of Brazil. Based on the set up of 100 pilot units along with parallel environmental recovery measures, exhaustive application of questionnaires and exerting influence on local governmental bodies, we have developed a complete dissemination model well adapted to the Brazilian environment. The stove technology is perfectly tailored to the needs of the women. The design matches cheap mass production requirements, and is sturdy enough to withstand 10 years of service.

Mother and daughter with new effcient cook stove

Communities plant native trees around their villages in order to provide a sustainable supply of fuel wood. A health impact study revealed fewer visits to the health posts, specifically of children to treat respiratory infections. The state government supported the initiative by granting the implementation of 4,000 stoves in 2007 and additional 4,000 units in 2008. About 3,000 efficient stoves are already in place and the women are highly satisfied with the now comfortable smoke-free kitchen. The flame is shielded, the heat trapped behind brick walls, cooking time is much reduced, and fire wood consumption is almost cut in half.

Further efforts are underway to obtain carbon credits for the stoves on the voluntary market.

Solar Cooking Spreads through El Salvador and Beyond

Camille McCarthy, Solar Household Energy, camcart@gmail.com,

In 2006, Solar Household Energy (SHE) launched a successful 50-family solar cooking HotPot project. Huizucar is a traditional rural pueblo in El Salvador, but the entire pueblo has now adopted this very untraditional cooking method. Solar cooking has also spread throughout the surrounding hamlets of Huizucar.

Thanks to the hard work of ACUA staff and community promoters (Estela, Gloria, and Carolina), we have trained close to 300 women in the proper use of the HotPot. These 300 women report daily HotPot usage has lowered their fuel-wood and gas use significantly. All three promoters report that interest in acquiring a HotPot remains high in the community. Additionally, they feel like they are making a positive contribution to their communities by spreading knowledge about solar cooking.

SHE also partners with two other NGOs, UNES and ALGES, in El Salvador. In total, approximately 500 women are using the HotPot on a daily basis helping improve the environment, familial health, and the economic situation of the family.

In Mexico one of the worst floods in the country's history ravaged the southern state of Tabasco last November, displacing hundreds of thousands of residents for several weeks. In response, two of SHE's partner organizations in Mexico, the Mexican Fund for the Conservation of Nature and International Logistics Solutions, made available 400 HotPot solar ovens to flood victims.

SHE is also working to raise awareness about solar cooking in the U.S. On March 21, SHE's co-founder Louise Myer and board member Pat

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McArdle presented "Solar Oven Revolution" and other short solar cooking films at the annual Environmental Film Festival in Washington. A link to "Solar Oven Revolution" is currently posted on the PCIA website video gallery, and the other films will be available on the PCIA website soon.

These women from Huizucar save $5-$10 on gas per month using the HotPot

Stove Team International Tests Ecocina Stoves at Aprovecho

Nancy Hughes of StoveTeam International has produced a report from tests on their Ecocina stove conducted at Aprovecho Research Center. The Ecocina stove operating with a skirt used a third less fuel than a laboratory three stone fire while emitting two thirds less carbon monoxide and particulate matter. The stove also received high marks for safety. For more information please see http://www.bioenergylists.org/en/ecocinatest030508.

UMW Students Tackle Indoor Air Pollution in Honduras

A team of University of Mary Washington (UMW) students is helping improve the environment for families living in Honduras. Seven students and Shawn Humphrey, UMW assistant professor of economics, recently returned from the village of Siete de Abril after surveying more than 50 families suffering from indoor air pollution from wood-burning stoves. The UMW team, along with two undergraduate researchers from UNITEC University in San Pedro Sula, Honduras, spent a week in January conducting in-depth interviews and assessments of the residents' respiratory health. The project was partially funded by both a UMW Student Research Grant and a nationally competitive grant of $1,000 from the Jimmy and Rosalynn Carter Partnership Foundation.

The students aim to raise enough money to provide every home in the refugee village with improved cookstoves. The stoves cost $83 each, and PCIA Partner AHDESA will provide training to the villagers in how to properly use the new stoves in their homes. The group has hired Sebastian Africano of ENASA to perform pre- and post-installation indoor air pollution monitoring, with UCB monitors and HOBOs provided by PCIA Partner Berkeley Air Monitoring Group. For more information, please see http://www.umw.edu/news/?a=799 or http://www.studentshelpinghonduras.org/iapinitiative. The group is also raising money for a microfinance institution in the community—learn more at http://twodollarchallenge.org.

International Network on Household Energy Launches New Website

The Women's Commission for Refugee Women and Children and the InterAgency Standing Committee Task Force on Safe Access to Firewood and Alternative Energy in Humanitarian Settings (IASC Task Force SAFE) have created a new website for the International Network on Household Energy in Humanitarian Settings at http://www.fuelnetwork.org. The purpose of the Network is to be a key multi-sectoral mechanism for NGOs, researchers, technical experts, international organizations, the private sector, government agencies, donors and others to share, receive and discuss information regarding household energy-related initiatives and technological innovations for use in humanitarian settings worldwide, including both conflicts and natural disasters. The website is being actively developed, and users are invited to send content and information that they would like to see promoted on the site to info@fuelnetwork.org.

ENERGIA Presentation on Biofuels at WIREC Side Event

The Stockholm Environment Institute (SEI) invited ENERGIA to present a paper on gender and biofuels at their side event 'North-South-South

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Forum on Biofuels, Climate and Sustainable Development' at WIREC. ENERGIA was represented by Gail Karlsson, who presented the paper 'Engaging Women in Small-scale Production of Biofuels for Rural Energy'. For more information please see http://www.energia.org/pubs/papers/2008_karlsson_sei-wirec_pres-sum.pdf.

Upcoming Events...

Carbon Expo and PCIA side event
May 7 - 9, 2008, Cologne, Germany

The World Bank has secured a household energy side event for PCIA at the upcoming Carbon Expo. The Carbon Expo is the world's leading global event for stakeholders in the Carbon Market, and provides a platform for emissions trading, carbon abatement solutions and new technologies. PCIA is currently putting together a panel of household energy experts with a goal of educating Expo stakeholders about the Partnership's work, and share examples of projects that are effectively reducing carbon emissions. The side event will be on Friday, May 9 from 14:15-15:15. More information on the Expo is available at http://www.carbonexpo.com/. Partners interested in helping or contributing to the side event should please email PCIAonline@yahoo.com immediately.

International Women Environmental Entrepreneurs Fair
October 5 - 14 2008, Barcelona, Spain
Application deadline April 30

The International Women Environmental Entrepreneur Fair aims to facilitate and strengthen women's productive enterprises that produce or provide services that are environmentally friendly, and showcase women's professional and business activities. For more information please see http://www.genderandenvironment.org/admin/admin_noticias/documentos_noticias/Form.doc.

Commission on Sustainable Development 16
May 5 - 16, 2008, New York City, USA

The CSD-16 Review Session will be focused on agriculture, rural development, land, drought, desertification, and Africa. It will provide various opportunities for major groups to contribute case studies and best practices, provide data and information on projects in the field, identify challenges and obstacles to implementation, and engage in interactive dialogues with government officials and other participants, including with Ministers during the high-level segment. For more information please see http://www.un.org/esa/sustdev/csd/review.htm.

Global Health Council - 35th Annual International Conference
May 27 - 31, 2008, Washington, DC, USA

The theme of the Council's 35th Annual International Conference is "Community Health: Delivering, Serving, Engaging, Leading." The conference will also address key issues of global health that are at the heart of the Council's work around the world, such as women's and children's health, HIV/AIDS, infectious diseases, and emerging threats. For more information please see http://www.globalhealth.org/conference/.

Energy and Poverty: Clean Cooking Fuels
June 16 - 17, 2008 Istanbul, Turkey

The workshop will focus on barriers to the transition to cleaner, more efficient fuels and technologies for meeting the cooking needs of the poor, and on measures for enhancing access, affordability, and supply. For more information please see www.iaee08ist.org/.

Better Air Quality (BAQ) 2008
November 12 - 14, 2008, Bangkok, Thailand

The theme of BAQ 2008 will be "Air Quality and Climate Change: Scaling up win-win solutions in Asia". For more information please see http://cleanairnet.org/caiasia/1412/article-72204.html.

☼ WHAT'S NEW?

... In Resources

Retained Heat Cooker Guide in Spanish

The Guide to Designing Retained Heat Cookers, written by Don O'Neal, Vice President of HELPS International and Special Projects Director, has now been translated into Spanish. The purpose of the Guide is to demonstrate how to effectively design, test, and distribute a retained heat cooker in a field setting. The development of the HELPS International Retained Heat Cooker was funded by a grant from the United States Environmental Protection Agency to further the mission of the Partnership for Clean Indoor Air, to improve health, livelihood, and quality of life by reducing exposure to air pollution, primarily among women and children, from household energy use. The Guide is available online at www.pciaonline.org/resources.

Fuel for life Now Available in French and Spanish

The WHO has published *Fuel for life: household energy and health* in French and Spanish. The publications include the results of the assessment of the burden of disease due to solid fuel use at national level. They can be downloaded from http://www.who.int/indoorair/en/, and printed copies can be ordered at http://www.who.int/bookorders.

World Bank Country Environmental Analysis report on Peru

The World Bank has published a Country Environmental Analysis (CEA) of Peru that includes information on the costs of indoor air pollution relative to other forms of environmental degradation. The Bank uses CEA as a diagnostic tool to evaluate the environmental priorities of development in client countries and the environmental implications of key policies. Indoor air pollution was the fourth most costly source of environmental damage analyzed, following outdoor air pollution, water/sanitation/health, and natural disasters. Household substitution from unimproved to improved stoves was found to provide the highest ratio of benefits to costs and the largest reduction in environmental damage. The report also includes estimates of the health impacts of indoor air pollution on women and children, and the cost of these health effects. For more information or to download the full report, please see http://go.worldbank.org/Z3F3QDPEF0. More information on CEAs, including the methodology used, will be the topic of a feature article in an upcoming issue of the Bulletin.

ESMAP publishes *Haiti: Strategy to Alleviate the Pressure of Fuel Demand on National Woodfuel Resources*

The Energy Sector Management Assistance Program (ESMAP) has proposed a strategy for striking a sustainable balance between the supply and demand for cooking fuels in Haiti. Key elements of the strategy include encouraging improved land management by farmers, more efficient use of woodfuels, imports and/or local manufacturing of efficient stoves, a mechanism to supply imported substitution fuels, and manufacturing and/or imports of equipment required for producing substitution fuels (e.g. briquettes) from agricultural products. The strategy is expected to produce at least a 20 percent decrease in charcoal consumption over a 10-year period during which LPG and kerosene consumption would double. Additional benefits of include 99,400,000 tons of CO2 emissions avoided over 20 years, and improvements in household health and safety. For more information please see: http://www.esmap.org/filez/pubs/620200775512_Haiti_English_Woodfuel_Resources_112-07.pdf.

Two WHO Publications on Indoor Air Pollution

The WHO has released two publications on indoor air pollution, titled *Indoor air pollution from solid fuels and risk of low birth weight and stillbirth* and *Indoor air pollution and lower respiratory tract infections in children*. The former reports on a symposium held at the Annual Conference of the International Society for Environmental Epidemiology (ISEE) in Johannesburg in September 2005. The latter

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reports on a symposium and workshop held at the International Society of Environmental Epidemiology, Paris, on 4 September 2006. It presents preliminary results of a randomized intervention trial in Guatemala and discusses the implications for policy, advocacy and future research. To read the full text of these publications, please see http://www.who.int/indoorair/publications/en/index.html.

Here Comes the Sun – Options for Using Solar Cookers in Developing Countries

The new brochure published by GTZ's household energy programme HERA analyses the successes and constraints in the dissemination of solar cookers. Neglected specific cooking traditions, high costs and shortcomings in maintenance and after sales services are hindering their successful dissemination and use. Nonetheless, in regions where virtually no alternative fuels are available and where it fits to cooking methods, solar cooking can take hold. Based on experiences of the GTZ pilot project in South Africa and on experiences and observations made all over the world the authors conclude that ten basic rules have to be considered for a successful dissemination and use of solar cookers.

The publication is available for download at: http://www.gtz.de/en/themen/umwelt-infrastruktur/energie/20674.htm (English, 1.92 MB) and http://www.gtz.de/de/themen/umwelt-infrastruktur/energie/20674.htm (German, 1.92 MB).

Additional PCIA Resources in Spanish

Design Principles for Wood Burning Cookstoves

This guide was developed by Aprovecho Research Center under a grant from the Shell Foundation to provide technical support to household energy and health projects to ensure that their stove designs represent technical best practice. It is available in English, Spanish, and French at www.pciaonline.org/resources.

PCIA Factsheet

The factsheet provides general information on the mission and activities of the Partnership, and is available in English, Spanish, Chinese, and French at www.pciaonline.org.

… In Research

Global and regional climate changes due to black carbon; Ramanathan, V. and Carmichael, G; Nature Geoscience. 2008 Mar, 23;1:221 - 227

Black carbon in soot is the dominant absorber of visible solar radiation in the atmosphere. Anthropogenic sources of black carbon, although distributed globally, are most concentrated in the tropics where solar irradiance is highest. Black carbon is often transported over long distances, mixing with other aerosols along the way. The aerosol mix can form transcontinental plumes of atmospheric brown clouds, with vertical extents of 3 to 5 km. Because of the combination of high absorption, a regional distribution roughly aligned with solar irradiance, and the capacity to form widespread atmospheric brown clouds in a mixture with other aerosols, emissions of black carbon are the second strongest contribution to current global warming, after carbon dioxide emissions. In the Himalayan region, solar heating from black carbon at high elevations may be just as important as carbon dioxide in the melting of snowpacks and glaciers. The interception of solar radiation by atmospheric brown clouds leads to dimming at the Earth's surface with important implications for the hydrological cycle, and the deposition of black carbon darkens snow and ice surfaces, which can contribute to melting, in particular of Arctic sea ice. To view the full text, please see: http://www.nature.com/ngeo/journal/v1/n4/abs/ngeo156.html.

PCIA Website Update

Please visit the website (www.PCIAonline.org) for information on PCIA activities!

Recent updates to the website include:

- **IAP Monitoring Workshop Proceedings Pages**
- **New Articles in Media Coverage**
- **Information on New Partners**

We encourage you to visit the website and give us feedback on these new features. For any website related questions please contact Winrock International at PCIAmoderator@yahoo.com.

☼ FACT BOX


PCIA Partners in Latin America and the Caribbean
23 Organizations Working in 11 Countries
reducing exposure to indoor air pollution
Mexico
Haiti
Belize
Honduras
Guatemala
Panama
El Salvador
Nicaragua
* PCIA Workshops and Events
Brazil
Peru
Bolivia
•Asociación Hondureña para el Desarrollo (AHDESA)
•Associação de Credito Popular
•Biomass Energy Foundation (BEF)
•Centro de Desarrollo con Energía Solar (CEDESOL-BOL)
•Centro de Ecología y Género (Centro ECO)
•Ecofogão Industria de Fogoes Ltda
•Energizing Development (GTZ-DGIS), GTZ Bolivia
•Fondo Mexicano para la Conservación de la Naturaleza A.C. (FMCN)
•Grupo Interdisciplinario de Tecnología Rural Apropiada A.C. (GIRA)
•HELPS International
•Instituto de Desenvolvimento Sustentável e Energias Renováveis (IDER)
•Instituto Nacional de Ecología (INE)
•Permagri SA
•ProPerú
•Project Gaia
•Proleña
•Solar Household Energy, Inc. (SHE)
•StoveTeam Guatemala
•Sun Ovens International
•Sustainable Harvest International
•Trees, Water & People
•Universidad Peruana Cayetano Heredia, Laboratorio de Respiración, Instituto de Investigaciones de la Altura