



PARTNERSHIP FOR CLEAN INDOOR AIR

PCIA Bulletin

January 2007 Issue 10

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 110 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!

IAP Awareness Drives Technology Changes

As we begin a new year already full of plans and expectations for providing thousands more families a healthier living space, a bit of reflection on the past year's advances is warranted. Indoor Air Pollution "IAP" may not yet be a common household term, but awareness of both the risks of IAP and the variety of available solutions is growing around the world. During 2006, Partners held workshops and trainings, produced, tested, sold or otherwise disseminated stoves and retained heat cookers; published papers and manuals; won prestigious awards; and exchanged information daily via listserves dedicated to IAP and household energy.

Last quarter, we reported that over 70,000 homes had adopted improved cooking and heating technologies under the ten PCIA pilot projects alone; the combined impact of all Partners is far greater and growing rapidly. Contributions to the PCIA Bulletin in 2006 came from 19 countries, reflecting the global span of this growing Partnership.

With the increasing awareness of and ability to monitor IAP, practitioners are more often paying attention to how well the technologies they promote are achieving reductions in emissions and indoor pollutant concentrations. Focus is no longer limited to anecdotal evidence of fuelwood savings. Dispersed groups are taking note of stove testing, IAP monitoring, and WHO guidelines—which themselves continue to evolve as information improves—and are making adaptations to maximize reductions in IAP exposure.

This issue features organizations from Tanzania, Pakistan and Brazil which have come to address IAP from different lines of work, but all ultimately seek to improve their technologies to more effectively promote health and quality of life. You will also read about new developments in plant-based fuel stoves, and stoves that generate electricity in addition to cooking heat. Enjoy!

Register and Submit your Abstracts NOW!

The 3rd Biennial PCIA Forum will be held in Bangalore, India, from March 20-23, 2007 (*please note there has been a venue change; details will be available on Bangalore on the website soon*).

Registration, abstract and financial support forms are available at www.PCIAonline.org.

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☀ FEATURE ARTICLES

Indoor Air Pollution Reduction Efforts in Tanzania: Some Lessons and Options from TaTEDO Experience

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Background

More than 90 percent of people living in Tanzania use solid fuels, mostly biomass (wood, cow dung and crop residues) for household cooking, heating and provision of process heat in small and medium enterprises (SMEs). The practice in Tanzania particularly in rural areas is that most biomass fuel is collected freely or bought and burned directly and inefficiently, over three-stone fires, leading to fuel wastage, poor indoor air quality, and significant health risks.

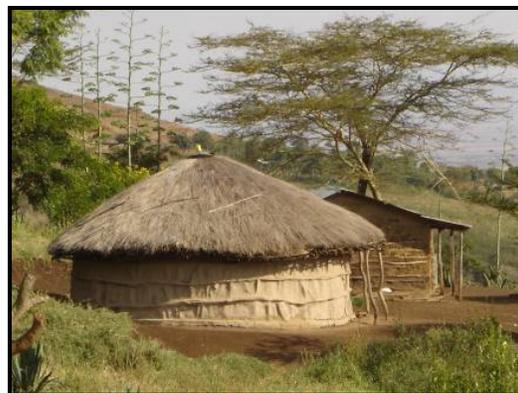
More than 98 percent of Tanzania's rural population has no access to grid electricity. Lighting in rural areas is mostly sourced from burning kerosene in wick-lamps which also emit a significant amount of smoke with harmful gases. A study conducted in Mwanza, Tanzania (TaTEDO/FREDKA, 2001) indicated that 67,810 households using kerosene for light emit around 6,695,726 Kg of CO₂ per year, giving an indication of the significant pollution produced by these rudimentary lamps.

Pollution levels resulting from kerosene use and stoves have not been adequately monitored and documented in Tanzania. Indoor air pollution (IAP) risks are poorly understood compared to other health risks caused by outdoor environmental pollution such as those from water, malaria, cholera and TB. Indeed many rural people are not aware of the effects of IAP resulting from burning biomass. As such they do not take IAP as a serious health threat. Similarly, IAP is not seen as a serious public health issue even at the national level and within related sectoral policies.

Though several sectoral legislations relate to air pollution in general, there is no specific legislation dealing with IAP. Instead, IAP is addressed through only a few institutions and mostly individual efforts taken by those few who understand the associated health effects, mainly academics.

Reports from several studies on effects associated with combustion of biomass and kerosene, air pollution and health effects which were conducted in countries like China, India and a few in Africa have been the main sources of information to countries with limited studies such as Tanzania. For instance, the first impact of indoor air pollution on the health of people in developing countries was reported as early as 1968 (Cleary and Blackburn, 1968 and Sofoluwe, 1968 and Msafiri, 2005). Another source of information on IAP has been the WHO through a programme known as Global Environmental Monitoring System (GEMS)/Air pollution in which Tanzania became a member in 1994.

These sources and many others have made TaTEDO aware of the need to enable people—especially the poor in the rural areas—to understand the effects associated with uncontained burning of biomass and kerosene and find ways of mitigating such effects. In many rural areas house ventilation is very poor; some houses have no windows and the majority lacks specific kitchen rooms (Msafiri and Pamela, 2005).



*Typical houses from rural poor in Tanzania
(Photo: J. Shuma – TaTEDO, 2006)*

As a result, most households members—especially women and children who spend more than 75 percent of their time in the kitchen (Semiono, 2005)—inhale a high amount of highly polluted air, much above the recommended WHO levels. Table 1 shows the results of a study conducted to establish the concentration levels of indoor pollutants including carbon monoxide, sulphur dioxide, nitrogen oxide and particulate matter.

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Table 1: Measured air Pollutants from rural households in Tanzania.

Type of fuel	Pollutants	Quantity	
		On site	WHO Guidelines
Woodfuel	Carbon Monoxide (CO),	325mg/m ³ (firewood) 148mg/m ³ (charcoal) 23mg/m ³ (kerosene)	30mg/m ³
	Suspended Particulate Matters (SPM)	13571 – 305798 µgm ³	150µgm ³
	Sulphur Dioxide (SO ₂),	26µgm ³ (firewood) 14.7 µgm ³ (charcoal) 0 µgm ³ (kerosene)	500µgm ³
	Nitrogen oxides (NO)	27.6 µgm ³ (firewood) 15 µgm ³ (charcoal)	240µgm ³
Kerosene	Particulate Lead (Pb)	Not measured	-

Source: Pamela Semiono-TaTEDO, 2005.

The study area was conducted in a village with a population of 3630; data was collected for 45 households, approximately 10 percent of the total households in the village. The gravimetric pump-and-filter method was used to measure total suspended particulate matter; CO was monitored using real-time combustion analyzer equipment fitted with CO gas sensors. The data was presented on a large display screen making it possible to display multiple parameters simultaneously; the data was saved for records and analysis.

Initiatives to reduce IAP

To alleviate health risks arising from smoke exposure, TaTEDO has been in the forefront of designing and implementing indoor smoke removal interventions. This includes promotion of biomass stoves that improve combustion, and improved kitchen designs with chimneys; sensitizing households, institutions and SMEs on the need for increased kitchen ventilation; and, where possible, promoting outside cooking practices and solid biomass substitutes, such as biogas and liquid biofuels.

TaTEDO works in collaboration with and with the support of her developmental partners, including the Norwegian Agency for Development Cooperation (NORAD), the Humanist Institute for Development Cooperation (HIVOS), Educational Training Consultants (ETC), and the United Nations Development Programme (UNDP). Through its programmes on scaling-up access to

integrated modern energy technologies and services, TaTEDO, has developed and built capacities for installing improved wood stoves with chimneys, through a participatory approach in several districts of Tanzania (including Mwanza, Muheza, Kibaha, Hai, Rombo, Lushoto, Kwimba, and Kahama), where more than 100,000 improved stoves have been disseminated and the number is increasing. Due to TaTEDO's close collaboration with local authorities, partners and appropriate institutional arrangements that include the establishment of district and village energy teams, the impacts and sustainability of access to modern energy services is now greater and assured.

Improved Cookstoves

From the mid-eighties there have been a number of isolated small efforts to promote improved stoves and substitutes such as biogas and more recently liquid biofuels. The use of LPG, kerosene and electricity for cooking is still very insignificant due to high initial costs of the stoves and fuels, as well as underdeveloped distribution infrastructure. TaTEDO took the initiative to promote improved biomass stoves starting in the early 90's. Since then, TaTEDO has implemented several programs and projects on improved biomass (charcoal, fuelwood and saw dust) stoves and improved kitchen management practices. The biomass stoves promoted by TaTEDO have efficiencies ranging between 30 - 40 percent as compared to 10-15 percent inefficient traditional wood stoves (TaTEDO, 1998/9).

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The choice of stove type depends on the beneficiaries' needs, localities (urban or rural) and types of wood-fuel available, while stove size depends on the number of people to be served or volume of food to be cooked. TaTEDO promotes stoves with chimneys as well as without, to provide a low-cost option. A study conducted by TaTEDO in 2006 showed significant reductions in 24-hour indoor concentrations of CO for three stove types: a mud firewood stove with no chimney (41%), a firewood stove with a chimney (70%), and a charcoal stove (66%).

In addition to the IAP reduction benefits, the improved stoves reduce wood consumption by more than 50% thereby reducing drudgery on women and children in searching for firewood. On the average in Tanzania, a household with improved stove consume about 1,700 kg of wood per year, in contrast to 2,900 kg/year with traditional wood stoves; for households using charcoal, annual use is 370 kg, compared to 1,080kg with traditional metal charcoal stoves.



Low-cost improved firewood stove appropriate for rural households (Photo: M. Darwin – Oxford University and TaTEDO, 2006)

Replication and scale-up of the TaTEDO experiences have started and currently work is ongoing in the same and newly-identified districts, where promotion and construction of improved woodstoves with better combustion and chimneys is progressing well. On the policy level, TaTEDO has been collaborating closely with national and local authorities while ensuring strong participation of key beneficiaries from the rural areas in information sharing and dissemination through different forums such as workshops, seminars and newsletters, posters, brochures and mass media programs.

TaTEDO is focusing heavily on the “Okoa” wood stove, comprised of two fire chambers, two pot rests used for cooking and a chimney. Through work supported by development partners already mentioned, TaTEDO has been able to continue to improve on the stove and initiatives for up-scaling the adoption of the stoves through market development, and self help efforts as well as capacity building are given high priority.



The specific design of the OKOA improved firewood stove that has contributed to IAP reduction in many rural areas (Photo: T. Mkunda TaTEDO –2005)

Complementary fuels and technologies

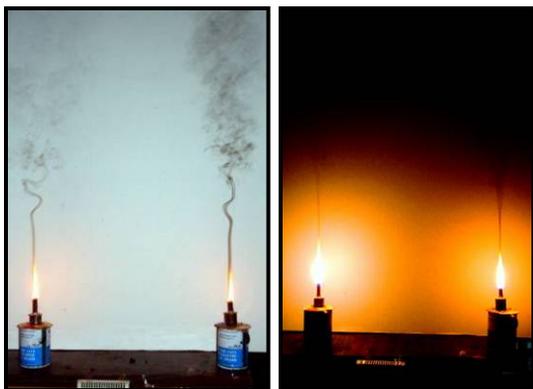
For more than eight years TaTEDO has been promoting use of solar PV technology for rural lighting in households and institutions, leading to the installation of more than 2000 solar home systems by trained technicians in seven (7) regions of Tanzania. The substitution of kerosene with PV enables reduction of harmful indoor pollutants.

Biogas and biofuels also present significant potential for contributing to IAP reductions in Tanzania, as alternative or complementary fuels to biomass. Since the early eighties, several small-scale biogas programs have been implemented in Tanzania using a variety of plant technologies from inexpensive plastic bag models to floating and fixed-dome models. Although more than 6,000 units are now in operation, the demand is still immense as Tanzania has nearly 4 million households involved in various animal husbandry activities, with some areas experienced in practicing zero grazing with more than three dairy cattle in the household.

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In the area of the liquid biofuels, TaTEDO has ongoing applied research, seeking the replacement of kerosene with locally-produced vegetable oil or biodiesel (primarily from the jatropha plant) in the locally-made wick-lamps. Also the visible smoke is greatly reduced as showed in the photos below.



In both pictures biodiesel (left) and kerosene (right) burning in locally made wick-lamps. In the first picture it is possible to see the difference in the amount of smoke emitted. In the second it is possible to see the difference in the intensity of the light (In all the experiments the size of the flame is the same). (Photo Perdomo, Leonardo – TaTEDO, 2006)

Way forward

These efforts are still limited and government among others needs to increase political and resource commitments toward indoor air pollution. Greater participation of key stakeholders is crucial for the success of any IAP initiatives.

For its part, TaTEDO is striving to increase national uptake of improved fuelwood stoves beyond the current 20% coverage, through collaboration with development partners and a strategy that involves strong participation of target groups, the private sector, and financial institutions, with close involvement of local authorities in the process of stove promotion from conceptualizing, planning, implementing, and monitoring. This strategy aims to strengthen the local institutional setting and capacity to ensure that efficient cook stoves are increasingly adopted, while alternatives for cooking fuels and electricity such as biogas and liquid biofuels are pursued.

Deliberate and immediate action needs to be taken to move the rural energy services from subsistence to modern energy forms and services that would improve the people's capacity to move

out of poverty. The impact of poverty in Tanzania demands that innovative financing mechanism be found. Appropriate policies, strategies and regulations should also be formulated and implemented to respond as priority on energy balance and modernization in rural areas. The innovations needed to reduce indoor air pollution can work so long as communities are involved through participatory efforts.

At the very least the challenge is to make the IAP agenda a national and people's agenda and raise the profile of the risks at the household level to higher levels among the hierarchy of needs.

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Improves Health and Sustainable Livelihoods in Northern Pakistan

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Aga Khan Planning and Building Service, Pakistan (AKPBS,P), an agency of the Aga Khan Development Network (www.akdn.org), has been working to improve safety and health conditions and promote solutions for housing-related problems in rural areas of the Northern Areas and Chitral region of Pakistan since 1980. One of AKPBS,P's programs, the Building and Construction Improvement Programme (BACIP), develops, manufactures and delivers affordable, regionally-appropriate home improvements which provide practical and imaginative solutions to harsh living conditions in a region where the average household income is 50 cents per capita per day and the unemployment / underemployment rate is 70%. The Northern Areas is one of the most remote, unattended, poor and cold areas of the high mountain regions of Pakistan. It is an earthquake-prone zone, with seismically weak housing unable to withstand a major or medium seismic jolt.

The poverty level of this area is reflected in the deteriorating housing conditions, as most households live in cold, dark, damp, dusty, smoky, non-ventilated, unhygienic, structurally unstable and congested houses. The average household spends about 18% of its disposable income, directly or indirectly, on housing,¹ the second biggest expenditure after food.² The main cause of children's death from indoor air pollution (IAP) is acute lower respiratory infections (ALRI). At 2.1 million deaths a year, ALRI is the world's leading killer of children under five. More than 50% of these deaths are caused by indoor air pollution, lack of adequate heating and other precarious living conditions.³ In Northern Pakistan, women and children under the age of five, who spend the majority of time inside the home, suffer the most from exposure to smoke and IAP. Furthermore, heavy use of wood for heating and cooking results in deforestation and causes excessive emissions and concentrations of CO₂ and other gases, both inside the house and into the atmosphere, resulting in irreparable damage to the ecosystem and biodiversity of the region.

To reduce IAP health-related incidences by at least 50%, BACIP works with community members to identify housing needs and determine

appropriate products. Feedback from community members, especially women, led AKPBS,P to design and distribute fuel-efficient smoke-free cooking stoves with improved metal sheets and chimney pipes (*ferife*), as well as wall and floor insulation, roof waterproofing treatment, and roof hatch windows to reduce dust particles and improve indoor heating.⁴ Good quality sheet metal ensures durability and eliminates leaks of smoke into the home. Designs vary from region to region to adapt to local norms, cooking and fuel use practices (some areas commonly bake bread; others use long wooden sticks, etc.). AKPBS,P monitors fuelwood consumption patterns over the seasons, using weight measuring devices among both control and case households, to verify fuelwood use reductions due to the improved cookstoves.

BACIP's water warming facility, one of its best selling products, also reduces smoke inside rural houses and decreases women's drudgery. By running pipes through the household woodstoves, this product simultaneously heats water while



BACIP model home with water warming facility (note blue tank in upper right and pipe inlet to stove).

food is being cooked. With access to hot water for laundry within the home, women and children spend much less time cold and wet by the river, where laundry has traditionally been washed—typically a 3-4 hour activity, which in winter time can present a significant health risk, particularly for the children.

Other products promoted by AKPBS,P range from bedding storage racks and food storage to seismic-resistant, energy efficient construction; solar products; bow string and composite beams for reducing timber use in roof construction; double glazed windows; and earthquake resistant wire-wall reinforcement.

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Community approach. Since its inception, BACIP has been designed as a project for the community by the community. BACIP identifies women from local villages to disseminate its products. By installing demonstration models in a few homes, villagers directly witness the benefits and learn about appropriate use. Women serve as resource/commission sales agents, who obtain orders and arrange for product delivery through local manufacturers and suppliers. Village workshops are held where community members give input into the research, design and refinement of each BACIP product to ensure sensibility, efficiency and applicability (e.g. feedback from women is helpful in determining the size of the stove, pots, etc.).

Encouraging women residents to partner in research, design and decision-making processes gives them a greater voice and enhanced status in the community. In BACIP product adoption more than 72% of the women made decisions without consulting their spouses (Hassan, Arif 2000). Local promotion and community awareness is raised through radio broadcast (e.g. interviewing women about the time- and cost-saving advantages of BACIP products), print material, cross-community visits, road shows, and seminars at local schools. To date over 12,500 BACIP products have been installed in 5,000 households benefiting over 43,000 people.

Sustainability. BACIP products are manufactured and sold by local entrepreneurs and artisans who are trained by AKPBS,P. Over 200 entrepreneurs, including sales women from the villages, have been trained in the design, manufacturing and installation of products. The products' low cost and production linked to the local market ensures long-term sustainability. BACIP is one of a few development projects in the region that operates on a "no subsidy" basis and is welcomed by community members of all income levels. A BACIP stove with water warming facility costs approximately US \$30-40.

Village women sell these products and get a commission, providing them with a modest income. Partnering with the First MicroFinanceBank Ltd of Pakistan, microcredit loans ranging from \$20-\$200 payable in a year are provided to homeowners. This was one of the first initiatives in Pakistan geared toward small investments for home improvement, an area for which banks traditionally do not offer loan products.

Impact. BACIP house improvements focus on resolving environmental health issues as well as poverty through better investments and saving money. Over the past seven years, smoke-free stoves, windows, water warming, insulation and construction technologies have decreased household greenhouse gas emissions by over 50% and reduced in-house smoke and other air pollutants by over 80%.⁵ An estimated 300,000 trees, valued at \$6.5 million, have been saved. At the household level, this translates into 50% annual savings in fuel wood expenditures; and a 50% decrease in incidences of acute respiratory infection, pneumonia and other illnesses,⁶ leading to a 25% savings in health-related expenditures. In 2003, AKPBS,P began a BACIP program in Sindh province, in South Pakistan. While household needs are different from the North, the participatory research and implementation process has allowed for easy replication and new products have been designed that match cultural and climatic requirements.

In March 2006, the AKPBS,P received the \$1 million Alcan Prize for Sustainability for its efforts to improve housing conditions as well as water and sanitation facilities in Pakistan. In October, BACIP was honored with the World Habitat Award 2006 for its innovative and sustainable housing solutions.

Footnotes:

1. This includes cost of heating, housing repair and 50% of health expenses as around 60%-70% of the diseases are caused because of poor housing conditions.
2. "An Assessment of Socio-Economic Trends and Impacts in Northern Pakistan (1991-97); Findings from AKRSP's Farm Household Income and Expenditure Surveys," Policy and Research Unit, AKPRS,P; February 2000.
3. "Smoke, the killer in the kitchen", http://www.itdg.org/?id=smoke_report_1
4. Traditional homes in Northern Pakistan have a roof hole to take the smoke out when open-hearth system was prevalent. These holes in the room bring cold air and dust besides bringing back the smoke of the traditional stove. The roof hatch window is designed to get maximum sun light during sunny days and also conserves the interior heat, and prevents dust from entering. It alone can save more than 50% of the energy requirements for heating.
5. Abbasi *et. al*, 2001, "Integrating Natural Resource Conservation with Built Environment" a report for AKPBS,P
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Dissemination of efficient cook stoves in Brazil: A challenge to curb respiratory disease and reduce fuelwood consumption

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The Institute for Sustainable Development and Renewable Energy (IDER), an NGO located in Fortaleza, Brazil, has been successfully working over ten years in several northeastern and northern states. Its work is based on the concept of sustainable development, environmental awareness and participation of population in the decision making process to foster rational growth through measures that address the present and future needs of the people and the planet.

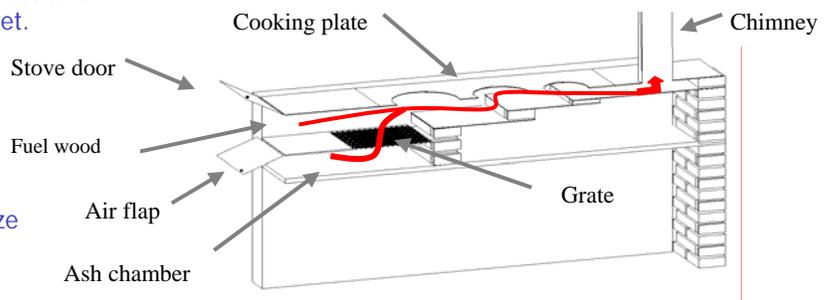
During the implementation of thousands of solar electric systems in rural households, IDER observed precarious cooking devices and smoke related health problems. Nevertheless, it took some time to realize the cruelty in terms of environmental damage and respiratory illness. Health problems related to smoke exposure have never been an issue of governmental prevention programs, although statistics published by SUS in 2005 revealed a significant increase of ALRI, allergies and ophthalmic illnesses during the last 5 years, in particular of women and children. The use of firewood has grown due to increasing LPG prices and cancellation of the gas bottle voucher for the poor. Considering a population of approximately 2.5 Million families living in the poorest regions of Brazil and estimating that 50% of those burn approximately 5 kg of firewood per day, some 6,000 tons of wood are burned daily only for cooking purposes.

The most significant devastation of vegetation in Brazil occurs in the state of Ceará where IDER works, where just 16% of the native forest remains. Besides charcoal production and tile baking, the use of firewood for cooking purposes is among the leading threats.

While fuel-efficient stoves are effectively disseminated in many developing countries, they are almost totally ignored in Brazil. No entity from whatever kind has assumed an attitude to solve one or the other cause by introducing efficient cook stoves.

Extended research on health and environmental issues in other countries revealed that highly positive results have been achieved by adopting relatively simple technologies. A variety of dissemination strategies have been adopted, with local culture and manufacturing capacities playing a major role.

The first step for IDER was to study already existing efficient cook stove designs which pull together as much as possible the operational characteristics of the common stove used in Brazilian rural households. We developed our first efficient cookstove based the named "Doña Justa" stove design, and tailoring it to the cooking habits and traditions of rural women in Brazil.



The stove design features physical and technical requirements to achieve efficient wood burning, optimized air flow and hot gas channeling, maximized heat transfer to the pots, improved heat insulation to the surrounding environment and leak-tight toxic gas exhaust piping. Twenty (20) prototypes were installed in selected rural households. The feedback from the women users was essential to introduce further improvements. For example, the susceptible hinge-joints of the air flap and ash door were replaced by an easy sliding mechanism. A flat hot plate to roast fish and prepare the popular "Tapioca" (a kind of tortilla made out of manioc flour) was incorporated in the stove design. And finally, the ash can now be removed by means of a drawer.

Since the basic construction of this newly developed stove only slightly differs from others in use worldwide, it is assumed that the benefits in terms of less fire wood consumption and health improvement should be similar. However, realistic data will be obtained during the project progress.

At this stage of development it was necessary to consider how to obtain sufficient funds to put into practice a pilot project with all elements to draw

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the attention of the responsible political entities for environment and health, and the Brazilian Development Bank-BN. We are thankful to the GAPFund which gave us the opportunity to implement such a pilot project.

The project is now in its early stage of implementation. In order to make available a long lasting but still affordable stove and favor local fabrication for simple marketing, the stove design underwent significant adjustments. Hand in hand with detailed cost analysis, the mainframe iron structure was slimmed to its most essential parts. Wherever possible, L-sections were substituted by round bars since they are three times cheaper. The cast iron grate was replaced by a heavy-duty welded piece. The chimney construction and other metal pieces were redesigned to fit the available sheet dimensions to yield less cutting waste.



Currently, the jigs for the mainframe mass production are ready. Production training at three local metal shops is under way in the municipal capitals. The first 200 stoves are financed by the project. However, the jigs will remain property of the shops and future clients have already shown interest in purchasing the stove. Baseline data collection regarding the social-economic situation, fuelwood supplies and health situation is in progress in the selected communities. All these data as well as market surveys and discussions with the BN Bank will lead to the design of a dissemination strategy adapted to the local environment.

We will come back soon to report on results, and stove performance. And hopefully we will have advanced in increasing awareness of political entities to build up a large-scale Brazilian program.



Woman with locally-constructed stove designed by IDER.

The rigid mainframe will ensure that all moving parts (air flap and stove door), the grate, cooking plate, and chimney stay in place and guarantee efficient wood burning and smoke elimination during its service life. This structure including the chimney will be delivered completely assembled to the installation site. Local masons, trained by IDER, will build the surrounding refractory brick walls. The stove lay out also assures that small defects caused by heat impact to the walls will not greatly influence the stove's overall operational characteristics and can be easily repaired by local means. It is expected that the stove will last 7 to 10 years. An entire stove installed at a rural household is calculated to cost about R\$ 220 (USD 100), which is in line with user expectations.

New Partner Developments in Technology: Field Testing

Protos - The Plant Oil Stove.
An initiative of Bosch and Siemens Home Appliances Group
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The objectives

The motivations to develop a plant oil stove are based on the fact that even today more than 2.5 billion people prepare their food on traditional "three-stone fireplaces", which are open fires fueled by firewood or plant residues. The emissions from those fires contain hazardous concentrations of presumably carcinogenic substances and lead to eye and lung disease. According to an estimation of the WHO over 1.6 million people die annually from exposure to this "indoor air pollution."

The very low efficiency of open fires results in a high consumption of firewood which leads – especially in combination with a growing population – to an increase in destruction of forests and consequently to serious ecological problems such as erosion, desertification, and flooding. As forests are reduced, collecting firewood becomes more time-consuming and the prices for firewood will rise for those who have to buy their fuel. Often, the firewood is more expensive than the food to be cooked.

Utilization of alternative energies is therefore desperately required. Utilization of plant oils as fuel is beneficial, especially because a vast number of oil plants are native to the tropics and subtropics. Even in remote areas, traditional methods exist for the harvest as well as for the production of the oil. In some places the supply of the plant oil exceed the demand. Moreover, numerous oil plants have been neglected so far because their oil is toxic for the human being or otherwise not suitable for nutrition. Examples for those plants are the Physic nut which is also known as Jatropha and the castor plant, respectively.

The Protos stove designed by the Bosch and Siemens Home Appliances Group, Munich, Germany, now allows the utilization of those oils in a sustainable system as renewable fuel. Target groups for the Protos stove are the urban and semi-urban poor, which are urged to buy their cooking fuel, as well as rural populations, which can produce plant oils as fuel by themselves.

The challenge

The functioning of the plant oil stove Protos is similar to the functioning of a kerosene pressure stove. For combustion of plant oils a completely new burner was developed. With this burner, diverse crude or refined plant oils like coconut or jatropha oil can be used as well as plant oil esters and kerosene.

The technical development of the plant oil stove was very challenging, since the chemical and physical properties of plant oils are considerably different to the properties of liquid fossil fuels. Among others, the inflammation points of the plant oils range between 180 and 260 °C, while that of kerosene is around 84 °C. The viscosities (50 mm²/s in comparison to 1.3 mm²/s) as well as the carbon residues (0,3 % in comparison to < 0.01 %) are likewise very much higher. However, the volumetric heating values of plant oils are comparable to those of liquid fossil fuels.

The technology was originally developed at the University of Hohenheim in Germany. Further development by the Bosch and Siemens Home Appliances Group (BSH) involves internal experts from diverse departments. BSH also cooperates with experts from various institutions like the German Universities of Karlsruhe, Stuttgart, Hohenheim, Munich, and the Leyte State University (LSU) in the Philippines.

The Solution

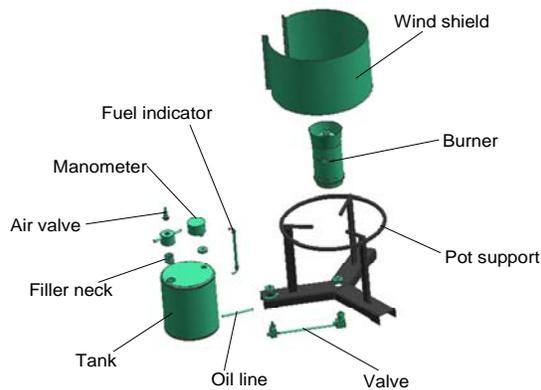
The plant oil stove Protos is shown in the following pictures.



Figure 1. Protos plant oil stove.

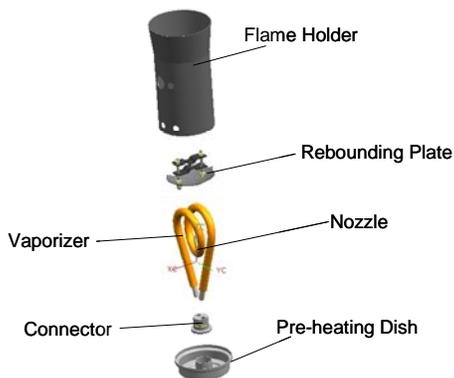
The functioning

The fuel is filled into the tank. With the use of a pump, air is introduced into the tank through the air valve increasing the pressure which is measured by the manometer. The fuel indicator allows monitoring of the fuel level in the tank.



Components of tank and support

The tank pressure causes the fuel to flow through the oil line toward the vaporizer. The burner flame heats up the vaporizer leading to a vaporization of the fuel inside. The vaporized plant oil is accelerated in the nozzle and mixes with ambient air. The air-fuel mixture hits the rebounding plate and burns within the burning area. The power of the stove is regulated by the valve in the oil line.



Burner components

For start-up, a small amount of alcohol is incinerated in the pre-heating dish, which heats up the vaporizer. The nozzle has to be cleaned from time to time with a nozzle cleaner as well as the vaporizer with a vaporizer cleaner. The tank contains up to 3 litres of oil which is sufficient for 6 to 16 hours running time. Known cooking pots, woks and other common cooking utensils can be used.

The field test

The stove technology has been tested since 2004 on the island of Leyte, Philippines, and beginning in 2006 also in Arusha, Tanzania. Both tests are supported by the Public Private Partnership Program of the German Ministry for Economic Cooperation and Development (BMZ) through DEG and GTZ, respectively. The tests are not only focusing on the technical adaptation of the stove technology to the local conditions, but also include the set-up of business cases for the plant oil and the stove production as well as the servicing and distribution system.

Given that rural farmers who can produce plant oils locally are among the target groups for the Protos stove, farmer cooperatives are also involved in the testing.

The user comments

The test users like very much the following characteristics:

- security of the fuel (explosion or uncontrolled burning can not take place)
- high efficiency (> 45 %)
- time saving through fast cooking (max. power > 3 kW)
- local production of the fuel as well as of most parts of the stove
- very low emissions (better for the health, pots stay clean)
- nice design

At the same time, users are also still commenting on some potential for optimization, including:

- cleaning of the vaporizer is tiresome
- utilization of pre-heating material is required
- noise
- Regulation

Together with its partners, BSH continues the intensive research and development activities to further optimize the Protos stove technology. However, there are already a lot of requests for purchasing the technology. The first 500 units will be sold by end of 2006, produced in a small series production line set up for the stove frame as well as for the tank at LSU. A bigger production line will be set up in a Chinese BSH factory. The burner requires a sophisticated production process with exact tolerances and will be produced by BSH. BSH is looking for partner organizations to introduce the plant oil stove technology to others in developing and emerging countries.

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Woodstoves Generate Electricity in Nicaragua and India: Field Testing of Prototypes

Winrock International and its partners Colorado State University (CSU) and Proleña /Nicaragua began last October the first field testing of the Firefly Ecostove, the first woodstove to be designed for both cooking and electricity generation for developing countries. The Firefly Ecostove uses a thermoelectric generator, which absorbs excess heat from the Ecostove combustion chamber (powered by a "rocket" stove), and generates about 18 watts of electricity. The four families who are testing the Firefly Ecostoves are using it for their daily cooking on a clean and efficient stove, while in the evenings lighting a 9 Watt compact fluorescent lamp and also powering a black-and-white TV.



A rural woman in Nicaragua with her Firefly-Ecostove generating cooking heat and electricity.

The goals of this project are two fold: to combine both needs for rural energy--i.e. thermal energy for cooking and electric energy for lighting and TV—in a single clean and energy-efficient technology; and to leverage funds from rural electrification projects to co-finance elimination of indoor air pollution. This project is funded by the Energy Collaborative Group from the "The Philanthropy Workshop", through the Tides Foundation, and is expected to conclude by April 2007. For more information, contact Rogerio Miranda at miranda@winrock.org.



Testing of thermoelectric lighting from stove, CSU lab

Meanwhile, entrepreneurial CSU students are currently pilot testing a similar stove, called the "Starlight" stove, in India, with a vision of commercializing the stove through Bright Light Innovations, a business developed by students as part of an entrepreneurship program with the CSU Global Innovation Center for Energy, Environment and Health, a joint program between the Colleges of Business and Engineering. The students' goal is to form a for-profit company that will develop and distribute the Starlight stove to provide cooking and lighting while reducing biomass consumption. They plan to distribute the Starlight stove for initial sales in Northern India and Nepal. Already, they have produced prototype stoves in India and are testing these in low-income households. The student team is working with [SEWA Bank](#) and [SELCO](#) in India to develop this business. For more information, contact Paul Hudnut, Director Global Social and Sustainable Enterprise Program, College of Business, paul.hudnut@business.colostate.edu.

PCIA Website Update!

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

New features on the website include:

- **3rd Biennial PCIA Forum web pages, including web-based registration form, call for abstracts, and information packet. Please note the following deadlines:**
 - January 12—Abstract Submission
 - January 19—Financial Support Form
 - February 12—Registration
- **New articles in Media Coverage**

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

HAPPENINGS

Recent Partner Activity...

Indoor Air Pollution and Ecological Stoves Seminar in Brazil

The first Brazilian seminar on indoor air pollution (IAP), ecological stoves and sustainable development was held in Brazilia, October 16-17. In Brazil, the number of households which use woodstoves is roughly 8.5 million, and this number is growing due to an excessive increase on LPG prices in recent years. In most of these households the stove technology is old fashioned, with low efficiency and high emissions. The goals of the seminar were to raise awareness among authorities and other stakeholders about the risks of IAP; present alternative, cleaner technologies such as modern woodstoves with improved designs, ethanol stoves and biogas stoves; and develop an action plan among the participants.

This seminar was organized by Winrock International, hosted by the Ministry of the Cities, and supported by USAID, Shell Foundation, the Ministry of Environment, the National Power Research Center, and GEF. Suggested actions included a proposal by the Ministry of Environment to exempt fuel efficient stoves from production taxes, training Ministry of Health agents to pass on adequate information to people living in remote areas, and forming a local partnership among participants and other interested parties. For more information, visit www.winrock.org.br.

First Global Air Quality Guidelines Now Available

In October 2006, the World Health Organization (WHO) released its first global Air Quality Guidelines that inform about elimination or reduction of air pollutants that are known or are likely to be hazardous to human health and wellbeing. These Guidelines provide a basis for all countries to build their own air quality standards and policies supporting health with solid, scientific evidence. For example, the Guidelines show that reducing the levels of particulate matter ten micrometres or less in diameter could reduce deaths in polluted cities by as much as 15% every year. Since, in the case of particulate matter, the highest exposures and greatest estimated burden

of disease are in developing countries due to indoor combustion of solid fuels, the importance of indoor exposure to air pollution is discussed in the Guidelines. It's important to note, that the Guidelines apply in all microenvironments where population exposure occurs, both outdoors and indoors. The WHO has convened a working group to design more targeted guidelines for the management of air quality in homes than the approaches applicable to outdoor exposure.

Visit the following websites for more information:

Press Release: WHO challenges world to improve air quality

<http://www.who.int/mediacentre/news/releases/2006/pr52/en/index.html>

Executive Summary: WHO Air Quality Guidelines

<http://www.who.int/phe/air/aqq2006execsum.pdf>

WHO Working Group Meets on the Development of WHO Guidelines for IAQ

A WHO Working Group meeting was held in Bonn, Germany, October 23-24 to identify main health risks due to indoor air pollution and to decide on the scope, format and the role of the WHO guidelines for indoor air quality. Three specific subjects - air pollutant-specific guidelines, biological agents, and the combustion of solid fuels - were addressed by the work of subgroups. The participating experts recommended that the future WHO indoor air quality guidelines should be applicable to all "non-industrial indoor environments".

The following priorities were identified: (i) Pollutant-specific guidelines and guidance will need to be developed/updated and made relevant to the indoor environment for benzene, naphthalene, formaldehyde, NO₂, radon, PM_{2.5}, PM₁₀, benzo-a-pyrene and halogenated compounds. (ii) Priorities in the context of biological agents are dampness control, ventilation, allergens (in particular house dust mites and pets) and crowding. (iii) Established guideline values for CO, PM_{2.5}, PM₁₀ and other pollutants apply to all countries and settings; however, a gradation approach will need to be adopted to help developing countries, where the

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household combustion of solid fuels is common practice, move toward these targets. It was agreed to develop technology-based air quality guidelines with a focus on the effectiveness of pathways (such as cleaner fuels, improved stoves and room ventilation) to reduce levels of IAP. The WHO indoor air quality guidelines will be developed over the course of two to three years, starting in 2007.

Partners Meet to Plan Activities for 2007

Sixteen members of the Partnership for Clean Indoor Air (PCIA) met in Bonn, Germany, October 25-26, following the WHO Indoor Air Quality Guidelines Expert Meeting (see above) to plan joint activities for 2007. Participants included representatives from Aprovecho Research Center, Bosch Siemens, GTZ, HEDON, Shell Foundation, University of California at Berkeley, U.S. Environmental Protection Agency, Winrock International, and World Health Organization. Specifically, they prepared for two upcoming events – the 3rd Biennial Partnership Forum in Bangalore India in March and the Commission for Sustainable Development at the United Nations in New York in May 2007 – and discussed emission and fuel efficiency benchmarks for cook stoves.

One outcome of the planning meeting was the realization of the importance of face-to-face meeting and the tremendous potential of working together, including understanding and working through issues together, and the infusion of



energy to keep the action going. Another outcome was that, following successful collaboration at CSD14 in May 2006, PCIA members agreed to promote household energy and health jointly at CSD15, in particular through (i) the preparation of a brief hand-out including a problem statement, available solutions and key messages to be considered by the CSD15 declaration, (ii) a side-

event at the Intergovernmental Preparatory Meeting in February 2007 or at CSD15 in May 2007, and (iii) lobbying with governments and other major groups prior and during CSD15.

To learn more about these activities and how you can participate, download the agenda and outputs at www.PCIAonline.org, and contact the lead for each activity.

2nd Commercialization Training Workshop Held in Ethiopia

The second in a series of PCIA Regional Commercialization Workshops was held in Addis Ababa, Ethiopia, November 7-10. The Workshop, which was sponsored by the U.S. Environmental Protection Agency and organized locally by Project Gaia, equipped organizations with the relevant and appropriate business skills to strengthen the commercial aspects of their household energy programs.



Representatives from 18 organizations participated in the Workshop. Organizations from Ethiopia included: Amhara Bureau of Mines and Energy; Ethio Resource Group Pvt. Ltd. Co.; Ethiopian Rural Energy Development & Promotion Center; Gaia Association, GTZ-Sustainable Utilization of Natural Resources Program: Energy; MAKOBU Enterprises PLC, Millennium Villages Project; U.N. Environment Programme; and U.N. High Commission for Refugees - Regional Liaison Office for Africa. Organizations from Kenya included: GTZ, Promotion of Private Sector Development in Agriculture, Practical Action, Solar Cookers International, Sustainable Community Development Services, and Winrock International. In addition, the Urban Community Development Association from Uganda, the Center for Household Energy and the Environment from Nigeria, and the Shell Foundation from the United Kingdom participated.

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The workshop was facilitated by two representatives of Accenture Development Partnerships (ADP), a not-for-profit unit within Accenture, the global management consultancy, which provides field-based business and technology consultancy services to organizations in the international development sector. Workshop participants were trained on the fundamentals of the Commercialization Toolkit that was developed and field tested for the Shell Foundation. The training helped Partners understand various aspects of the business cycle, such as macro environment, customer and demand, supply analysis and sustainability to ensure that a self-sustaining delivery system is in place to support scale-up.

The workshop resulted in an increase in the Partners' understanding of commercial considerations and tools available to help them scale up their stove programs. At the end of the workshop, ten organizations presented action plans that they will undertake in the short and long term to improve the commercial aspects of their program.



CleanCook Stove (left) and kerosene stove (back right)

Following the three-day commercialization workshop, workshop participants went on a one-day site visit of Project Gaia's Clean CookStove pilot project and the GTZ' Mirt Stove Initiative in and around Addis Ababa. Project Gaia is piloting the ethanol-fueled Clean CookStove as an alternative to traditional (biomass) and improved (LPG and kerosene) stoves, and GTZ is promoting both the Mirt Stove which is specifically designed to cook injira bread and an improved biomass stove. Both stoves reduce both fuel consumption and indoor air pollution.

PCIA Partners Participate in the Better Air Quality-Asia Conference

More than 1,000 experts from Asia, Europe, the Americas, and Australia gathered to present their work on air quality management, research, and implementation strategies at the Clean Air Initiative-Asia (CAI-Asia) biennial Better Air Quality Conference (BAQ-2006) held in Yogyakarta, Indonesia, December 13-14. This conference, and the work of the CAI-Asia, has historically focused almost exclusively on ambient air pollution. However at BAQ-2006, the Partnership for Clean Indoor Air teamed up with conference organizers to sponsor three panels on indoor air pollution from household energy use. The primary focus of the panels was to inform policymakers about the great strides that have been made in various aspects of reducing indoor air pollution from home cooking and heating practices over the past few years and the importance of re-invigorating this work throughout the region.

The three IAP panels were titled: "Indoor Air Pollution;" "Linkages between Indoor and Outdoor Air Pollution;" and "Social Marketing to Reduce Indoor Air Pollution." Speakers included PCIA Partners: Dr. Kirk Smith from the University of California at Berkeley; Anuradha Bhavani from Shell Foundation - India; Xia Zuzhang from The Nature Conservancy China Program; Sumeet Saksena from the East-West Center; Christina Aristanti from the Asia Regional Cookstove Program (ARECOP); Guangging Liu from the China Association of Rural Energy Industry; Minh Cuong Le Quan from the Cambodia Fuelwood Savings Project; and John Mitchell from the U.S. Environmental Protection Agency.



In addition to the three panel discussions, ARECOP arranged a household energy site visit

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prior to the conference, and a PCIA booth was organized to distribute information about the efforts of the Partnership and individual Partners who were participating in the conference. A number of improved stoves from throughout Asia were displayed at the booth and some were lit to show how they operated. For press coverage of the meeting, see <http://dawn.com/2007/01/04/int11.htm>

“Killer in the Kitchen” Conference Held in Alabama

The Southern Institute for Appropriate Technology/Servants in Faith and Technology (SIFAT) and the Sparkman Center for Global Health at the University of Alabama at Birmingham co-sponsored a conference, "The Killer in the Kitchen: Indoor Air Pollution and Appropriate Technology Solutions," November 16-18. This conference drew a multi-sectoral group together including missionary and development workers, stovers, Guatemalan community members, university students, nurses, and engineers.

The diversity of conference participants contributed to a broader understanding of the issues and solutions for smoke in the kitchen. Sessions addressed health, development, and environmental concerns, strategies for community mobilization and education, the physics of fuel-efficient stove designs, the economics of stove production, as well as hands-on demonstration and stove construction time. Total conference attendance was 71 (26 attended the full conference; 45 attended some sessions).

Attendees came from Africa, Asia, Latin America, and several states (FL, GA, OR, CA, IL, TX, AL).

Special thanks to presenters Larry Winiarski (Aprovecho Institute), Don and Lois O'Neal (HELPS International), Stuart Conway (Trees, Water and People), Bev Blum (Solar Cookers International), Martha Port (Solar Oven Society). Also to Paul Anderson and Paul Weaver for their stove demonstrations. SIFAT greatly appreciates all the presenters and participants, and anticipates incorporating this training into SIFAT training in community development and appropriate technologies for meeting basic human needs in a 10-week Practicum (Sept. 1- Nov. 9, 2007) at SIFAT, as well as in trainings overseas. For further

information please contact Kathy Bryson at brysonk@sifat.org.

Countries Draw Attention to Annual World COPD Day

World COPD Day is an annual event organized by the Global Initiative for Chronic Obstructive Lung Disease (GOLD) to improve awareness and care of chronic obstructive pulmonary disease (COPD) around the world. World COPD Day 2006 took place on November 15th around the theme "Breathless not Helpless!" More than 80 World COPD Day activities took place in over 30 countries around the world in 2006, involved patients, families, health care professionals, and public health officials in raising awareness of this disease and what can be done to combat it! Visit <http://goldcopd.com/WCDIndex.asp> to read more about the day and search on activities in your country.

PAHO/Peru Hosts Seminar on IAP from Traditional Fires

The Peruvian Pan-American Health Organization and Winrock International jointly assumed the commitment to analyze strategies for reducing the health impact of indoor air pollution (IAP) from traditional three-stone biomass fires, through the presentation and exchange of experiences in implementing improved cookstoves in households of scarce resources. The Seminar on IAP from Traditional Fuelwood Stoves was organized with this objective, and held at the Pan-American Center for Sanitary Engineering and Environmental Sciences (CEPIS) in Lima, December 13-14.

Seminar objectives were: 1) to increase awareness of the impact of IAP on the health of women and children in Peru; 2) to share experiences with key aspects that foster behavior change and overall sustainability of interventions that introduce healthy stoves; 3) to identify links between the public and private sectors to increase access to interventions by the poor; 4) to detail technical guidelines and promote the standardization of appropriate technological solutions; and 5) to generate recommendations for the adoption of effective interventions to achieve impacts on a large scale.

National and international representatives of public and private entities with extensive

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experience in health and environment issues participated from Bolivia, Mexico, Nicaragua and Peru. Together, participants addressed technical and health aspects related to indoor air pollution. Invited guest speakers included government and university officials, as well as NGO representatives and professionals linked to the topic.

Principal recommendations resulting from the seminar included:

- Seek standardization for improved stoves to increase their use through participation of the private sector and micro-enterprise.
- Incorporate improved stoves in the rural housing programs developed by the Ministry of Housing.
- Seek community participation in the design of houses and/or kitchens, prioritizing use of local materials and labor of the users themselves.
- In response to a perceived need, form a network of institutions that work on IAP and related issues to facilitate the exchange of experience and take maximum advantage of the achievements made to date.

For more information, contact Homero Silva at hsilva@cepis.ops-oms.org.

Upcoming Events...

ETHOS Conference 2007

January 26-28, Kirkland, Washington, USA

Engineers for Technical and Humanitarian Opportunities for Service (ETHOS) is holding its annual conference in Kirkland, Washington. The conference covers advances in lab and field experiences with improved cookstoves and other cooking technologies, as well as other crucial aspects of sustainable household energy and health interventions. As always, ETHOS encourages participation of Southern partners, international stoves experts, and development specialists with field experience in the transfer of cooking technologies. This year, a discussion on stove testing standards and testing methods will be held on Friday afternoon, prior to the traditional evening social gathering in anticipation of the weekend's busy agenda. To register, please visit: <http://www.vrac.iastate.edu/ethos/conference.php>

4th International Biofuels Conference

February 1-2, New Delhi, India

The focus of this annual conference is largely on biofuels for electricity and transportation; it may, however, be relevant to partners interested in biofuels for cooking. For more information, see <http://www.winrockindia.org/doc/Conf07.pdf>

Regional Training on High Quality Charcoal and Briquetting

February 26 – March 7, 2007, Pak Chong, Thailand

Charcoal making and use is popular in many Asian countries and it has been used for centuries for cooking and ironing. Charcoal is also popularly used in many small industries. Yet, the technology of charcoal production remains traditional and inefficient. By providing an opportunity to acquire the necessary skills to introduce improved carbonizing and low-density briquetting technologies, local communities will acquire income generating opportunity.

This training, organized by the Asia Regional Cookstove Program (ARECOP) and Indonesia & Appropriate Technology Association, Thailand, aims to address the lack of skill and know-how and awareness on the potential of charcoal production and briquetting in order to upgrade biomass fuel into a better and cleaner fuel. ARECOP will be convening experts in the region to share their skills and knowledge in the Regional Training on High Quality Charcoal Production and Briquetting.

Central America Regional Bioenergy Conference

February 27 – March 1, 2007, Managua, Nicaragua

Nicaragua's National Energy Commission (CNE) is collaborating with ETHOS to host a 3-day conference to address management of bioenergy resources around Central America, including the development and dissemination of improved woodstoves to address health, economic and environmental impacts associated with inefficient, unhealthy and unsustainable fuelwood consumption for cooking. Participants will include government and non-government entities, private enterprises and academia, and will address both technological as well as policy-based issues critical

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to the region. An optional field tour will take place following the formal conference agenda. For more information, contact dendroenergia@cne.gob.ni.

International Conference on "New Villages with Renewable Energy"

March 12-13, 2007, Beijing, China

This international conference will present results of the Sino Dutch Cooperation Project on Promotion of Rural Renewable Energy in Western China and aims to share valuable experiences and rationales for replication and scale up. The Sino Dutch project is a grant project of the Netherlands Government for cooperating with China with the objectives of promoting comprehensive development and utilization of renewable energy in western China; improving the quality of energy used by rural residents; promoting farmers' income growth; reducing poverty; and improving the local ecological environment. As of the end of 2006, the project has benefited nearly 12,000 people with beneficiary farming households having reduced cooking time by 5 to 6 hours per day on average, in addition to improved cooking conditions which are reducing the chances of respiratory and ocular infections among the rural poor. Farmers' incomes have also continued to increase. For more information on the conference, please visit <http://www.bioenergylists.org/en/CAREIMar2007>

3rd Biennial PCIA Forum

March 20-23, 2007, Bangalore, India

More than 100 household energy and health leaders will gather to report on extraordinary results, celebrate breakthrough achievements, and commit to attaining bold future goals to advance to the next stage of reducing indoor air pollution from cooking and heating practices for 3 billion people in developing countries.

Specific objectives of the Forum include: raising the visibility of this issue and the innovative, successful efforts being implemented in countries, regions, and worldwide; strengthening Partners' capacity to implement highly effective household energy programs, and mobilize and leverage resources; identifying common strategic objectives and opportunities for collaboration; developing a PCIA Declaration on the new generation of healthy and affordable household energy interventions to present at the U.N. Commission

on Sustainable Development in May 2007; and generating commitments and actions to achieve the eight Forum priorities.

Registration deadline is February 12, 2007. For more information, please visit: <http://pciaonline.org/2007IndiaForum/index.cfm?c=progAnnouncement>.

Commission on Sustainable Development – 15th Session

April 30 – May 11, 2007, New York, USA

The 15th session of the CSD will be held at the UN Headquarters in New York. This is the second, or policy year of the second implementation cycle during which the Commission will continue its focus on the following areas: [Energy for Sustainable Development](#); [Industrial Development](#); [Air pollution/ Atmosphere](#); and [Climate Change](#). Indoor air pollution related events will also be held at CSD 15. For more information, please visit <http://www.un.org/esa/sustdev/csd/policy.htm>.

WHAT'S NEW?

...in Resources

Breathing Space – a Short Film

The recently completed short film features Shell Foundation's work combating indoor air pollution from traditional cook stoves in India. To view the film and read new articles on the issue, visit http://www.shellfoundation.org/newsletter/01_12_2006/kf14.htm. For a hard copy of the film, please contact Jo.Chandler@shell.com.

World Bank's Energy and Gender Website

This site is the result of collaboration between the World Bank's Poverty Reduction and Energy Management (PREM) Gender and Development Unit and the Energy Sector Management Assistance Program (ESMAP). The site provides information about energy, gender and the MDGs; business models; subsidies; events; and resources. To visit the website, please go to <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTENERGY/EXTGENENERGY/0,,menuPK:2440347~pagePK:149018~piPK:149093~theSitePK:2440335,00.html>.

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IARC Study on Carcinogenicity of Household Solid Fuel Combustion

The International Agency for Research on Cancer (IARC) in France convened a Working Group to assess the carcinogenicity of household solid fuel combustion (coal and biomass) and of high-temperature frying. The Group concluded that indoor emissions from household combustion of coal are carcinogenic to humans, and that indoor emissions from household combustion of biomass are probably carcinogenic to humans. These assessments will be published in Volume 1 of the IARC monographs. For more information, please visit http://www.iarc.fr/ENG/Press_Releases/pr172a.html and <http://download.thelancet.com/pdfs/journals/1470-2045/PIIS147020450670969X.pdf>

Best Practices in Global Health Award Call for Nominations

The **Best Practices in Global Health Award** is given annually to celebrate and highlight the efforts of a public health practitioner or organization dedicated to improving the health of disadvantaged and disenfranchised populations, and to recognize the programs that effectively demonstrate the link between health, poverty and development. **The deadline for submitting nominations is Thursday, February 15, 2007.**

Visit http://www.globalhealth.org/conference/view_top.php?id=608 for additional award information.

Energy Policy Paper on Health Effects Engineering

Energy Policy, the International Journal of the Political, Economic, Planning, Environmental and Social Aspects of Energy, has recently published an article entitled, "Health effects engineering: Perspectives for environmental health and environmental engineering studies—domestic biomass combustion as an example", by three authors from Fudan University in China. Health effects engineering (HEE) is a newly developed research field, which involves collaboration with environmental scientists, engineering researchers, and toxicologists. By employing the methods of HEE, one can not only confirm which attributes of the project are likely to contribute to certain health effects, but can also get rid of the adverse health effects by engineering technologies.

WHO 1st Africa Regional Health Report

The World Health Organization released its first African Regional Health Report titled "The health of the people" in November 2006. Chapter 5, "Health and the Environment in Africa" discusses indoor air pollution as a serious environmental issue and a major threat to public health (pgs. 87-88). For more information, visit http://www.afro.who.int/regionaldirector/african_regional_health_report2006.pdf

Brookings Launches Global Health Financing Initiative

Washington, D.C. (December 14, 2006)

The Brookings Institution launched a new global health financing initiative, aimed at assessing mechanisms to fund health programs in poor countries and determining which could best increase and improve the impact and efficiency of global health financing. The initiative was established through a Bill & Melinda Gates Foundation grant of \$3.18 million over two years.

The new initiative will be led by David de Ferranti, Senior Fellow and former Vice President at the World Bank. It will be part of the Global Economy and Development Program. Over the next two years, the global health team will evaluate current and potential health financing proposals in depth and issue practical recommendations on how to fill financing gaps through the use of public and commercial finance, aid programs and philanthropy. Innovative financing instruments will be assessed in terms of their capacity to increase net financial resources and improve health system performance in developing countries. More information is available at www.brookings.edu/global.

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 will be **Household Energy and Humanitarian Assistance**, is **February 15, 2007**

DISCLAIMER: Unless otherwise stated, information contained in this Bulletin is not necessarily the opinion of and/or endorsed by all Partners.