

# Cleaner cooking

by Rebecca Voelker

*The Rotarian* -- November 2010

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As a volunteer with a medical relief team that traveled to Guatemala in 2004, Nancy Hughes saw babies whose lungs were clogged with creosote, men with hernias from carrying 100-pound bundles of firewood, and a woman who was unable to use her hands because of severe burns she sustained at the age of two. Unsafe stoves and open-flame cooking were the culprits in every case.



*Illustration by Dave Cutler*

In developing countries, 60 to 90 percent of people burn solids such as wood, coal, crop waste, and dung to cook their food and heat their homes. Open fires and stoves without chimneys release acrid smoke and toxic particles into dwellings that are often small and poorly ventilated. Women, who do most of the cooking, and small children are most likely to breathe the polluted air.

Respiratory problems – coughing, wheezing, and tightness in the chest – are common among people exposed to these pollutants. The list also includes more severe conditions: lung cancer, chronic obstructive pulmonary disease, pneumonia, heart disease, cataracts, and low birth weight in babies born to women with frequent exposure.

“The leading cause of death in children under age five throughout the world is indoor air pollution,” says Hughes, a member of the Rotary Club of Eugene Southtowne, Ore., USA. According to the World Health Organization, indoor pollutants released from solid fuels claim 1.6 million lives each year. The death rate “is bigger than outdoor air pollution or malaria,” says Kirk Smith, director of the Global Health and Environment Program at the University of California, Berkeley.

Smith has found that in India, about 160 million households burn solid fuels in unsafe stoves. Cleaner cooking methods, he says, could prevent the deaths of 570,000 impoverished women and children there each year. In Guatemala, his study of 500 Maya children and their mothers showed that using cleaner stoves could reduce child pneumonia and decrease women's symptoms of respiratory diseases.

Nongovernmental organizations and companies such as Land Rover and Royal Philips Electronics are working to fund, design, and distribute stoves that substantially reduce emissions and disease risks. Hughes is the driving force behind StoveTeam International, which has helped local entrepreneurs produce and sell more than 11,000 stoves in Central America over the past two and a half years, with support from more than 40 Rotary clubs and Matching Grants from The Rotary Foundation.

"At first, the women were skeptical. But once they saw the benefits of the stoves, they accepted them better." - Mariangela Bizzarri

"People are finally waking up to the fact that this is a problem," she says. With funding from sources including musician Carlos Santana's Milagro Foundation, Hughes got the effort going, first in El Salvador and now in Guatemala, Honduras, and Nicaragua. Stove designers Larry Winiarski and Ken Goyer – a fellow member of the Eugene Southtowne club who passed away in June – provided technical support. Hughes met with government officials, relief groups, and community residents to demonstrate Winiarski and Goyer's stove. Resembling an oversized cement crockpot that can be fitted with a flat metal cooking surface, the 50-pound Ecocina can be carried outside and has sides that stay cool to help prevent burns. The design, called a "rocket elbow" stove, reduces carbon emissions by 70 percent.

In some conflict-ridden parts of the world, women who must walk considerable distances from their villages to collect firewood face dangers, including the risk of rape. An important feature of the Ecocina is that it uses about half the wood that a traditional stove requires, meaning fewer wood-gathering forays and a reduced risk of attacks.

Mariangela Bizzarri, a Rome-based consultant with the World Food Programme, has studied violence against women as it relates to firewood collection in Darfur, Sudan, and the Karamoja region of northeast Uganda. In Karamoja, cattle raiders have become better armed in recent decades, and attacks against women gathering firewood have escalated. "This is happening quite frequently," she says. In addition, men who accompany the women for protection have

been killed.

The World Food Programme and other agencies have also introduced stoves that use less firewood, helping to keep women safe from violence and reducing the likelihood that they will skip meals if they don't have enough wood for cooking. Those stoves, which resemble the Ecocina, are replacing traditional, basic ones made from rough blocks of clay, soil, and dung. (The blocks are placed in a horseshoe shape, with the fire burning in the center.) "At first, the women were skeptical," Bizzarri says. "But once they saw the benefits of the stoves, they accepted them better."

The cleanest, most efficient stoves are models that convert solids to gas, which is used for cooking. "The best ones have little blowers in them," Smith says. The blower, operated by a rechargeable battery, cell phone charger, or built-in thermoelectric generator, stabilizes airflow in the stove. As a result, the fuel burns more uniformly – and more efficiently. "These get really clean combustion," he says.

Scientists are working to create better, cleaner stoves that women in developing countries will want to use. "The rocket elbow stoves I've seen are not clean enough," Smith notes. "But a new generation with blowers on them might be."

The health risks resulting from the smoke and pollutants created by burning solid fuels indoors are much the same as those linked with smoking tobacco, he says. "The worst thing you can do is stick burning stuff in your mouth. The next worse thing is to stick it in your kitchen."

[Learn more](#)

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4 Comments:

At 10:07AM on 22 November 2010, **Dianne Mattar Artist Sacramento CA** wrote:

Just returning from a service trip to Guatemala & Honduras....actually making the stove; visiting "homes" (dirt floors, walls made of corn husks, no running water or electricity....but a safe economical way to cook....using 1/5 of the wood than open fire...most rewarding go Rotary go continue to make a difference..Thank you

At 4:02PM on 9 November 2010, **Juan C. Cheves** wrote:

I feel honored to know Nancy and that my RC here in Guatemala has been able to provide our

little part to this great project. Thank you Nancy, we love you!!!!

At 10:02AM on 1 November 2010, **Cecelia Babkirk** wrote:

The Rotarian has done the world a great service by calling attention to the problems of indoor air pollution in homes in the developing world, however the author failed to realize that most who live in this environment do not have access to electricity, nor do they live in homes similar to those in Europe, Canada and the United States. Where on earth would a stove beneficiary - likely a poor woman in a remote village in any developing country - acquire a stove with a "little blower" in it, not to mention replacement batteries, a cell phone charger or a thermoelectric generator? As one who has seen such homes, this was amusing to me. Such things are certainly not a sustainable solution using local materials and employing local labor. The depiction of someone with black lungs in front of a large, smoke-filled stove shows a lack of understanding of how most of the world lives and cooks. In the Ecocina stove projects, StoveTeam International not only addresses the problems of indoor air pollution but also the cause, which is lack of a local source for such stoves at a reasonable price. Our Rotary Club is actively pursuing the development of multiple stove factories with StoveTeam and we would encourage other Rotary Clubs to do so as well. The solution is in our hands. Cecelia Babkirk, Cupertino, CA

At 9:22AM on 25 October 2010, **Ray Sanford** wrote:

Our club joined with 10 other clubs in our district and one in Guatemala to purchase 1,156 Ecocina stoves from the new factory in Guatemala. StoveTeam projects are "win-win-win-win." They provide local jobs, better health, more time and opportunities for women, and a better planet. How cool is that?