



By making affordable water filters and improved cookstoves available to households in Guatemala, the project aims to reduce the costs of fuel wood plus the incidences of respiratory and water-borne disease, which are serious problems for the poorer communities in the country.

The project, which is the first Gold Standard water treatment or cookstove project in the country, distributes water filters and stoves that enable access to clean water and improve cooking conditions by increasing fuel efficiency and reducing harmful indoor air pollution. Carbon finance is used to develop a low cost supply chain which means low-income households can afford the devices and make immediate savings on the cost of fuel-wood.

The project

This Gold Standard project uses water filters which are manufactured and distributed in association with the winner of the World Bank's 2011 Innovation Award, Ecofiltro. The water filters enable households to access safe drinking water through the purification process of a gravity fed ceramic filter made of clay, sawdust, colloidal silver and carbon. The water filter treats two litres of non-potable water per hour and removes 99% of pathogens. Currently, approximately 35% of the country's rural population drink water before it has received any treatment while 39% boil their water. The project aims to increase the number of households that treat their water and reduce the need for fuel wood to boil it.

Despite almost 90% of Guatemala's rural population having improved water access and over 70% of the rural population receiving water piped into their homes¹, water-borne disease is a major issue. It has been identified as a national priority in Guatemala given the high incidence of diarrhoeal disease and chronic malnutrition. There are 25,000–75,000 cases of diarrhoea reported each month nationally due to infected water. Several studies have found that municipally provided tap water is unsafe for drinking and, in 2007, a study of tap water across the country found that 80% of the collected samples were contaminated with coliforms.

In addition, high-quality, affordable, improved plancha wood stoves are also distributed as part of the project to replace inefficient traditional 3-stone fires. The improved cookstoves use simple design enhancements to burn biomass fuel more

cleanly and efficiently. Known as "eko-stoves", the stove was designed specifically for this project in order to be locally appropriate for the communities. It has an enclosed fire chamber with a metal surface suitable for cooking local foods such as beans and tortillas both with pots and directly on the metal plate.



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Implementation and the use of carbon finance

The water filters and improved cookstoves are sold to households by Ecofiltro and a local NGO, Socorro Maya. Carbon finance enables them to be made more affordable to low-income households with an 18 month payment plan that requires households to pay no interest on their borrowings. There is no upfront cost and families can begin to save on fuel wood (and the associated costs) immediately.

Staff are employed by Ecofiltro and Socorro Maya for manufacturing the products, installing them and training households on their use, and social work in the local communities. The project aims to have 800 staff employed throughout the supply chain by its fifth year.

Each household that purchases a water filter or eko-stove receives help with installation, training and after sales services from technicians. Support is also provided by social workers; typically women employed to work part-time and maintain the project's presence in the community. Alongside helping to distribute the filters and cookstoves, the social workers work with communities to improve their quality of life. For instance, distributing prenatal vitamin supplements that aid healthy pregnancies.

The Paradigm Project, an international social enterprise that specialises in the development of highly scalable, locally managed supply chains for communities in need, has developed and owns the project and was also responsible for selecting the local partners working in the supply chain.

Reducing indoor air pollution

The project tackles serious problems that affect many of the most disadvantaged in Guatemala. The incidence of respiratory and water-borne disease is reduced as less fuel is used and more water is treated.

Over 2.7 billion people, or one-third of the world's population, rely on burning biomass (such as wood fuels, charcoal and dung) in traditional stoves for their daily cooking needs². In Guatemala alone, the UNDP and WHO (2009) estimate that every year 1,200 children under five die of pneumonia and 300 adults die prematurely of chronic obstructive pulmonary disorders resulting from traditional solid fuel use fires. Burning biomass releases substances hazardous to human health including carbon monoxide, nitrous oxides, particulate matter and black carbon. By burning fuel wood more cleanly, the eko-stove reduces the amount of harmful pollutants that families, and especially women, are exposed to. In addition the water filters, as well as reducing water-borne disease, treat non-potable water without the need for fuel wood and consequently also decrease indoor air pollution.



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Economic benefits

By enabling households to use no fuel for water filtration and to use less fuel more efficiently for cooking, the project benefits them by saving both money and time.

Currently 60% of urban and 94% of rural households cook with locally sourced fuel wood, in part because prices are relatively low, costing \$0.04/kg of fuel wood. The average household that uses an improved cookstove for cooking will reduce its biomass use by an estimated 65% which equates to 1,700kg annually. Given that 49% of households that use biomass purchase the wood, it will save the average family an estimated \$35 per year from fuel savings³. Households that boiled the water they used (88% of the targeted population) prior to purchasing a water filter will also save on fuel wood costs.

The project also helps households save time from cooking and collecting wood. For example, the improved efficiency of the eko-stove means women are estimated to save roughly 30 minutes per day from time typically spent cooking.



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Deforestation

Decreasing fuel wood use eases the burden of overuse on forests and subsequently decreases deforestation rates. Guatemala has among the highest rates of deforestation in Latin America, with 17% of total forest cover lost between 1990 and 2005. It is estimated that 96% of wood harvested nationally is non-renewable, demonstrating a highly unsustainable forest use practice in the country.

The major threat to the biodiversity in the region is land use change. Guatemala is part of the Mesoamerican biodiversity hotspot, which represents 0.5% of global land but possesses 17% of all terrestrial species and is considered the second most important of the 25 hotspots in the world⁴. Currently 8.1% of Guatemala's terrestrial species are considered threatened. Reducing fuel wood use will tackle one of the country's drivers of deforestation and the corresponding threat to the country's biodiversity.

Deforestation also impacts environmental services that rural communities rely upon. For example, the soil erosion which occurs when deforestation takes place has an impact on agricultural yields, and deforested or degraded hillsides become susceptible to landslides during tropical storms that affect Guatemala.

The region

The project is first being implemented in rural and peri-urban communities throughout Alta Verapaz, Huehuetenango and San Marcos Departments. It will initially focus on developing within these three Departments and then aims to expand nationally once the project's two products have been widely implemented.

This project improves the wellbeing of those most in need by targeting rural and peri-urban populations in a low-middle income country. Guatemala ranks 131 out of 187 countries on the United Nations Development Programme's 2011 Human Development Index – a comparative measure of life expectancy, literacy, education and standards of living for countries worldwide. In 2006, 51% of Guatemalans lived below the national poverty line⁵ (earning less than USD 2.30 per day)⁶. Rural residents and indigenous groups have poverty rates significantly above the national average (75% and 76% respectively).

