

Inkawasi Stove



Type

Built-in fixed household rocket stove with two potholes, adobe base, prefabricated ceramic combustion chamber, concrete top plates and chimney.

Names

Inkawasi stove

Fuel

Standard Version: Fuelwood

Highland Version: llama dung, cow dung, *tola* (shrub), *yareta* (a tiny flowering native plant), fuelwood

Country of origin / dissemination area

Peru, developed in 2001 by Ing. Jose Humberto Bernilla and Klas Heising, GTZ, in the village of Ayamachay.

Between 2005 and 2007, 14 000 Inkawasi Stoves were installed by different institutions in the northern and southern Peruvian Andes.

Users

Rural, peri-urban households in the Andes

General Description

Fixed, built-in massive stove with:

- Two sunken pots with a single combustion chamber
- Two concrete slabs with pot-holes
- Tall chimney, half adobe, half metal
- Handcrafted elbow-shaped ceramic combustion chamber.

The stove is built using rocket principles, with a shelf for directing firewood into a tall combustion chamber, sunken pots, and a well-defined airflow. The pot-holes are customised for specific pot diameters.

Actual modification substitutes the typical shelf through a grate and separate inlets for air and fuel. Depending on the fuel predominantly used (often alpaca dung) different grates are used.



Stove dimensions

Dimensions for an average stove:

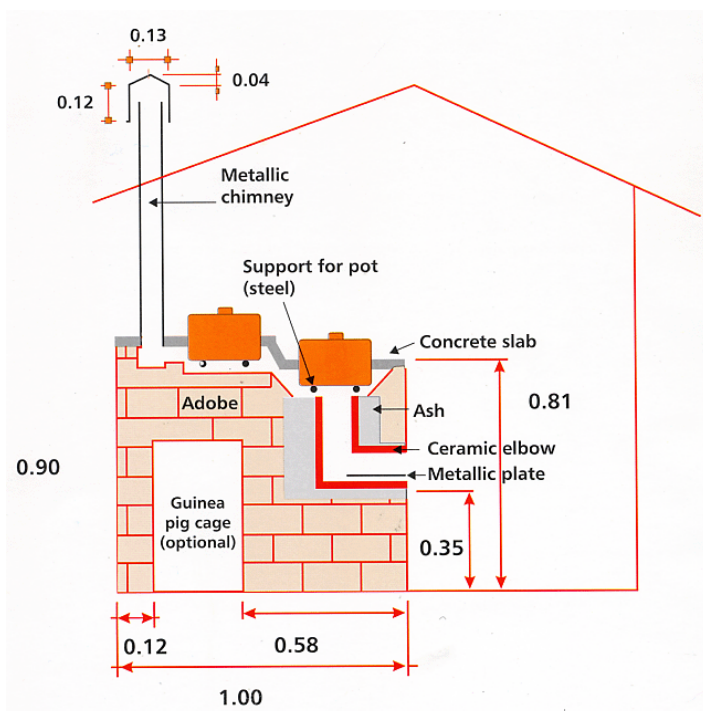
- Length 100 cm
- Width 55 cm
- Height 35-40 cm
- Chimney height ~ 2,5 m.

Lifespan: Average is more than 6 years

Materials used

Stove body: adobe bricks with clay as binder.

Combustion chamber: Handcrafted or prefabricated refractory clay. Elbow shaped with 2.5cm–3cm wall thickness, 12cm inner diameter, 30cm leg length.



Recent models have square combustion chambers of similar size. These can be fabricated in an industrial process. Ash as an insulator.

Concrete Slabs: 0.5kg cement, 0.5 bucket of sand, 0.5 bucket of gravel, 2m galvanized wire.

Chimney: made entirely of metal pipe or partly of adobe bricks and metal.

Efficiency

High potential to alleviate indoor air pollution through chimney, if properly maintained.

Saves up to 60 % of the firewood that would be consumed using a well-tended three-stone fire, provided the two pot-holes are used properly.

The cost benefit ratio of stove dissemination programmes of 1 to 7, calculated by the World Bank for Peru, was based on this Inkawasi Stove.

Production / Supply

The stove is produced by local installers who are trained and supervised by local, more senior colleagues. The combustion chambers are produced locally by artisans (currently approximately 10 producers), or by an industrial manufacturer in Lima.

Price (2008)

Total cost: approximately 36 EUR. This price includes materials, such as combustion chamber and metal parts brought in by the installer, and installer's fee, but does not include mud bricks and ash provided by the beneficiary.



Strengths and weaknesses

Positive

- + Efficient stove with great potential to reduce indoor air pollution due if chimney maintained properly
- + Prefabricated parts facilitate high quality and fast installation.
- + Enhances local production
- + Extremely safe
- + High user satisfaction
- + Design option available for high altitudes (3800m – 5000m altitude)
- + Very thoroughly tested and with a proven positive health impact

Negative

- Relatively expensive
- Prefabricated parts need local infrastructure to provide them, and construction skills to install them.

Available documents

GTZ-PAHO/WHO regional project 'Improvement of Environmental Conditions in Indigenous Communities': Improved Stoves as a Key Intervention to Enhance Environmental Health in the Andes. Lima, Eschborn 2007.

<http://www.gtz.de/en/themen/umwelt-infrastruktur/energie/20674.htm>

Manual de Capacitación e Instalación de Cocinas Mejoradas – Inkawasi.

Source of pictures: GTZ Peru

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