

Inkawasi TAWA Stove

Peru



Type

Built-in household rocket stove for three sunken pots with single combustion chamber and chimney

Name

"Inkawasi TAWA" stove (TAWA means "number four" in Quechua language)

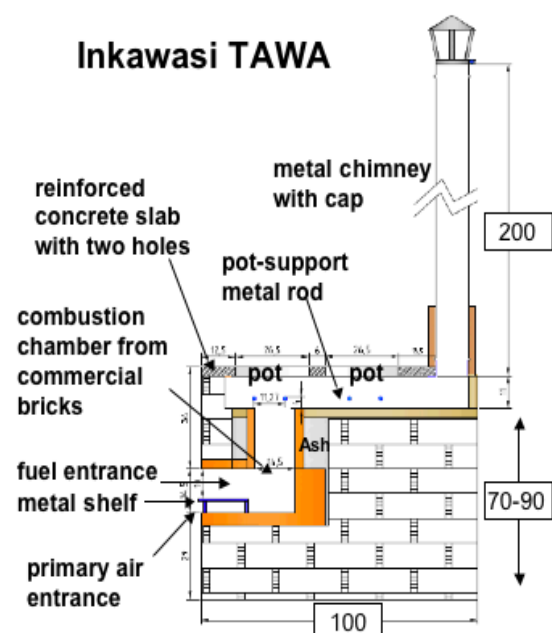
Fuel

Fuelwood

Country of origin / Dissemination area

Peru

Developed in 2009 by Ing. Jose Humberto Bernilla (GIZ) based on the original 'Inkawasi UK' ('UK' = number one). The specific design is based on commercially available materials. The stove is disseminated in large numbers by the Peruvian Ministry of Energy and Mines under the programme NINA which is part of the national campaign 'Medio Millón de Cocinas Mejoradas por un Perú sin humo'. It is planned to contribute 125,000 stoves for "A Peru without smoke" by 2011. By the end of 2010, over 15,000 Inkawasi TAWA stoves had been built.



Users

Rural, peri-urban households, countrywide

General description

Fixed, built-in high-mass stove:

- Single rocket combustion chamber made of two types of commercially available bricks (six-hole-bricks and solid tiles), surrounded with ash for insulation.
- Loose metal shelf for fuel support
- Only one inlet for air and fuel
- Prefabricated ferro-cement slab with pot-holes for two sunken pots
- Metal chimney with removable cap

The stove-design is based on the 'rocket principles' with a grate for primary air below the fuel and a tall insulated combustion chamber. The chimney creates horizontal airflow around the sunken pots for optimal heat-transfer and guides the flue gases out of the kitchen. The pot-holes are customised for specific pot diameters (26.5 cm). Each pot rests firmly on two horizontal metal rods.

Stove dimensions

Dimensions for an average stove:

- Length: 100 cm
- Width: 60 cm
- Height: 70-90 cm
- Chimney height: 2 m

Estimated lifespan

More than 5 years. The shelf needs replacement after one year.

Materials used

Combustion chamber: 14.5 x 14.5 cm, made from nine commercial six-hole bricks (ladrillo pandereta) and five flat bricks (ladrillo pastele-ro), surrounded by ash as an insulator

Stove base: Mud, adobe, fired bricks or stones, whatever is locally available



Stove body: Adobe or fired brick, with mud or cement mortar

Concrete Slabs: 3 cm thick, reinforced with electro-welded wire-mesh ½” squares and wire no. 8.

Pot rests: 12 mm reinforcement bar

Chimney: Metal tube (diameter: 12 cm) from galvanised sheet with protecting cap, which can be detached for cleaning. Base covered with adobe for heat protection.

Performance

High potential to reduce indoor air pollution through chimney, if properly maintained: CO by 97%, PM by 97%. It boils 5 litres of water in 17 minutes. In the laboratory the stove saved 62% of the firewood compared to an open fire, figures from the field are not yet available as dissemination only started in 2010.

Production / Supply



The stove is mostly built by the beneficiaries, who are trained and supervised by local, senior ‘Sucapas’, paid by the programme. The beneficiaries provide the material for the base and the stove body. The metal kit (shelf, pot rests and chimney), the slab and the commercial bricks for the combustion chamber are supplied by the programme, which also provides matching pots, patterns and visual instruction guides for quality assurance purposes. The slabs and the metal kit are manufactured by local providers.

Price (2011)

Total material costs (combustion chamber, concrete slab, grate, rods, chimney)

provided by the programme are around 32.00 € excluding mud, bricks, mortar and ash provided by the beneficiary.

Strengths and weaknesses

Positive

- + Efficient stove with great potential to reduce indoor air pollution if the chimney is maintained properly
- + Prefabricated parts allow high quality and fast installation
- + Enhances local production and income generation
- + Extremely safe
- + High degree of users’ satisfaction
- + Allows people to cook upright

Negative

- Relatively expensive
- Local infrastructure needed to provide prefabricated parts
- construction skills needed for installation
- If the shelf remains covered by hot coals it can wear out faster

Available documents

- Cocina certificada No. 11: Inkawasi TAWA
<http://www.cocinasmejoradasperu.org.pe/avances.html> (go to “laboratorio de evaluación y certificación” > catálogo de las cocinas” (at the bottom of the page)
- Posters: How to build my improved stove (Como construyo mi Cocina Mejorada)
- How to use and maintain my improved stove (Como uso y mantengo mi Cocina Mejorada)
<http://www.cocinasmejoradasperu.org.pe/infografia/cocinamejorada.pdf>
- Manual de Capacitación e Instalación de Cocinas Mejoradas – Inkawasi TAWA.

Source of pictures: GIZ Peru / SENCICO
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