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PERFORMANCE EVALUATION OF WOOD-BURNING COOKSTOVES IN RURAL AREAS NEAR PUCALLPA, PERU

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Abstract

Rural areas near Pucallpa City in the Peruvian Amazon have no access to electricity. Fuelwood is the main source of energy and is used for open-fire cooking, which is generally considered as less efficient cooking method. The performance of two improved cookstoves (Ceramic Stove - CS and Rocket Stove – RS) has been compared with the traditional open-fire three-stone cooking method locally recognized as Traditional Cocina (TC). The CS and RS were constructed by the indigenous tribe of Shipibo-Conibo near Pucallpa based on their traditional ceramic knowledge. In a local survey, three different tree species, including: Guaba (*Inga spp.*), Capirona (*Calycophyllum spruceanum* Benth.) and Citrus (*Citrus spp.*) were found to be the most commonly used fuelwoods. In this study, the lab-based water boiling test (WBT version 3.0) and controlled cooking tests (CCT version 2.0) were used to assess the stove performance. On average, the thermal efficiencies of CS and RS were approximately 8% higher during all WBT phases, as compared to TC. Conversely, specific fuel consumption and firepower during all WBT phases was about 98 $g.kg^{-1}$ and, in the case of TC, 1.9 kW higher, as compared to CS and RS. The results of CCT showed significant energy savings in the cases of CS (37%) and RS (39%), as compared to the traditional method (TC). Improved cookstoves have the potential to save a significant amount of energy as compared to traditional cooking methods in the rural areas near Pucallpa, Peru.

Key words: energy performance, energy performance, fuelwood, improved cookestoves, Shipibo-Conibo ceramics

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