

Firewood consumption in 16 communities of the lower areas of 4 basins in the Pacific slope of Guatemala

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One of the goods given by forests to communities is firewood, which is defined as net wood, trunks, branches and other parts of trees and bushes from forests or plantations that are used for heating, cooking and drying clothes purposes (home) and steam production and electricity generation (industrial). In Guatemala, by 1999, the estimations of firewood consumption were around 14 million cubic meters, assuming demand and direct correlation between population and percentage of houses that use firewood and annual consumption per capita⁴. In rural areas, the use of firewood as energetic product ranges between 79% and 100%. Up to date, few studies about firewood consumption have been performed, and generally, its impact is associated to negative effects of degradation and forest loss due to bad forest management practices. A diagnosis from the local firewood market in Tecpan Guatemala and San Juan Sacatepequez (IARNA, 2009) concluded that, in rural areas, dependency on firewood for cooking was maintained and it was also noticeable that using firewood applied pressure on the natural forest. Beside this factor, it has been verified that incomplete combustion, common in low efficient stoves, releases small particles that contain several chemical substances which are hazardous for human health.

Even though firewood consumption can constitute as a threat, this use also grants some economic value to the forest, characteristic that can be utilized to promote a sustainable exploitation of the resource. Because of this and due to the social dynamics that can influence in the characteristics of its consumption and supplying, it is necessary to have regional data about its market.

With the purpose of knowing the trends of residential use in locations in the Pacific slope of Guatemala, a study was performed in 126 houses of 16 communities in the lower areas of the basins of the rivers Coyolate, Achiguate, Acome and Maria Linda. The information was gathered through a survey that contained 37 questions, information that will guide actions that contribute to reducing the pressure over the remaining forest resources in the region. This investigation evaluated variables such as: types of energetic products used at home, type of stove, origin of the energetic products used (location, type of forest, type of exploitation and geographic location), transport (cost and type) and distances travelled, purchasing or gathering firewood and

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⁴URL, IARNA (Universidad Rafael Landívar, Instituto de Agricultura, Recursos Naturales y Ambiente). 2009. Mercado de la leña: estudios de caso en Tecpán Guatemala, Chimaltenango y San Juan Sacatepéquez, Guatemala. Guatemala. Documento 32, Serie técnica 30. 38 p.

its frequency, preference of species and its substitutes. The survey used to collect the information, was modified from the one used by the study performed by IARNA in 2009.

The results obtained through the survey indicated that 97.6% of the houses used the energetic resource firewood: 59.1% of the families stated that they used it for all of the activities of the house; while a 33.3% used it specifically for cooking corn and beans. Firewood trading was executed in 4% of them. About the substitutes of energy generation, 45.2% of the families had access to propane gas and only the 23% to electricity. 88.6% of the surveyed families said they used a *polleton*-like stove (a traditional Guatemalan structure used for cooking), and 8.1% had open fire stoves, while only 3.3% of them had an energy saving stove. About the product used, families indicated to use more cracked wood than branches or rolls. Gathering is the most common supplying method (43.9%) which is followed by the mix between gathering-buying (32.5%) and 23.6% of the surveyed homes gets its firewood only through purchases. The maximum annual firewood usage for an open fire stove was of 32.43 m³; while that the *polleton*-like stove was of 11.76 m³. This depends of several factors, such as the type of stove, number of family members and uses (self-consumption or trading). If the purchases were monthly (29% of surveyed houses), the annual purchases ranged between 8.9 and 10.8 m³, and if this was made daily (27.5%), between 14.4 and 24.36 m³. Gathering was placed in an annual average of 31.86 m³.

About purchasing firewood, most of the people got it by tasks (49.3%) or as log (40.6%) and the average cost per task was calculated in Q159 (US\$21), while the average unit value of log was of Q0.25 (US\$0.03). The resource was mostly obtained from a deposit (59.4%) or from a farm (18.8%). More than 3/4 of the surveyed families (76.8%) indicated that the distance travelled to get it was less than 1 km.

About gathering, most of the firewood was gathered by parents (75.8%). In the 24.2% of the houses that gathered such resource, kids supported this duty. On average, 3 daily hours were invested, 4 times a week. To obtain such resource, 26.6% of the surveyed families walked less than 1 km; 30.9% travelled between 1 to 4 kms; and 24.5% travelled more than 6 kms. 71.1% of them stated that they found the resource inside of the community where they were located. Firewood came from private lands (49.6%) or from self-owned properties (16.8%). The main sources were scattered trees (24.1%), agroforestry systems (18.1%) and natural forests (15.4%). The resource came primarily from fallen dry branches (39.9%), dead trees in river banks (17.6%), tree branches (14.4%) and leftovers of timber harvestings (7.5%). The number of species used as firewood was increased to 61 and a total of 25 species composed the list of not-used as firewood.

In many houses of rural and urban areas, firewood is the only source of energy for domestic tasks. Results from this kind of studies allow to know local realities to provide alternatives adapted to such contexts. Such proposals will promote a more efficient use of this energetic resource, contributing to the actions to mitigate climate change, at the same time to improve the health conditions in the households because of the appropriate use of more efficient stoves that encourage proper ventilation. Through tests with different stove

models, it was observed that these contribute to an average monthly firewood savings of 60%⁵, reducing in more than 90% the emissions of carbon monoxide and the particles of carbon.

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⁵ tPW Energy Collaborative y Escuela Agrícola Panamericana Zamorano. 2009. Evaluación de siete tipos de estufas mejoradas en campus y en las comunidades alrededor de Zamorano. Proyecto Centro de Certificación de Estufas Mejoradas. Honduras. 112 p.