Effect of Improved Stoves on Wood Consumption, Particulate Matter, and Carbon Monoxide Production

Poster · September 2017
DOI: 10.13140/RG.2.2.23766.75848

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Cummins

Introduction

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Rural comunities | Traditional stoves/Biomass

Deforestation, Health, Climate Change, Biodiversity, Water Pollution, Mudslides, etc

What is the impact of improved stoves?

A)Data collection

1

2

3

Weight | Survey | IAP Meter

B) Analysis

$$y_{ijklmnp} = \mu + a_i + \beta_J + \gamma_K + \delta_l + \vartheta_m + a\beta_{ij} + \beta\gamma_{jk} + \beta\delta_{jl} + \beta\vartheta_{jm} + b(a)_{in} + \varepsilon_{ijklmnp}$$

The adjusted model for average PM(ug/m³) and CO(ppm)

Results

Table 1. Average Particulate Matter (ug/m³) estimated by the model including wood stove models and countries

	Honduras		Panama		N	Mean
Wood stove model	n	Mean	n	Mean		
Improved	14	2,6 c	46	440,7 b	60	91,1 b
Traditional	33	967,4 b	45	4057,7 a	78	2156,7 a
Mean	47	178,5 b	91	1634,7 a		

Table 2. Average Carbon Monoxide (ppm) estimated by the model between wood stove models and countries

	Honduras		Panama		N	Mean
Wood stove model	n	Mean	n	Mean		
Improved	31	0,3 a	51	19,7 a	82	4,9 b
Traditional	27	20,1 a	47	52,3 a	74	33,7 a
Mean	58	5,0 b	98	33,4 a		

Table 3. Average wood consumption (kg) per day by country and stove model

	Honduras		Panama		N	Mean
Wood stove model	n	Mean	n	Mean		
Improved	157	5.59	176	5.64	333	5.6
Traditional	100	10.9	99	11.52	199	11.21
Mean	257	8.24	275	8.58	532	8.4

Conclusions

- Adoption and Use ✓
- Local ✓
- Wood + Biomass ✓
- Health ✓
- < CO(ppm) & < PM(ug/m³) ✓