



calculated as more than USD200, which is nearly equal to two years' worth of cooking fuel expenses for one household.

(T. Izumi)

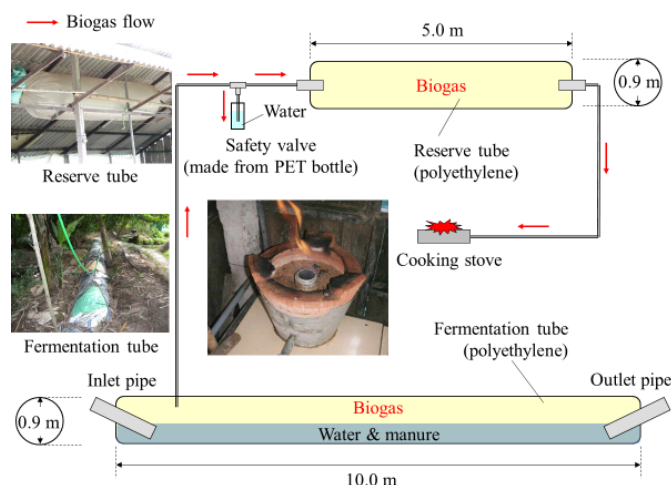


Fig. 1. Plastic biogas digester (BD) system

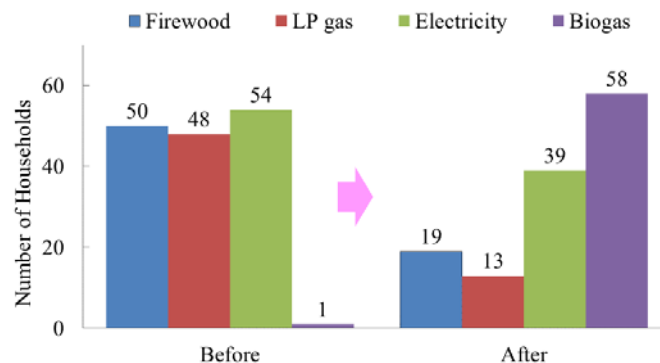


Fig. 2. Changes in cooking fuel usage before and after biogas digester (BD) installation

Note 1. Total number of surveyed households: 66  
 Note 2. Y-axis values refer to number of households that used each cooking fuel type during the study period  
 Note 3. One household used biogas digester (self-installed before project initiation)

Table 1. Changes related to farm household cooking fuels before and after biogas digester (BD) installation  
 (One household, Average of 66 households)

Item		Before	After	Difference
Amount of cooking fuel used	Firewood (t year <sup>-1</sup> )			
	Cooking	1.59	0.32	-1.27
	Pig feed	1.50	0.38	-1.12
	Total	3.09	0.70	-2.39
	LP gas (kg year <sup>-1</sup> )	27.3	2.4	-24.9
GHG emissions (tCO <sub>2</sub> year <sup>-1</sup> )	Firewood			
	Cooking	1.20	0.24	-0.96
	Pig feed	1.13	0.29	-0.84
	Total	2.33	0.53	-1.80
	LP gas	0.08	0.01	-0.07
	Total	2.41	0.54	-1.87
Expenses for cooking fuel (USD year <sup>-1</sup> )	Firewood (purchase)	14	1	-13
	Firewood (collection)	53	12	-41
	LP gas	45	4	-41
	Total	112	17	-95

Note. Survey on cooking fuel expenses was conducted based on Vietnamese currency (VND) and converted to US dollar using the exchange rate as of survey period (from 2012 to 2014).

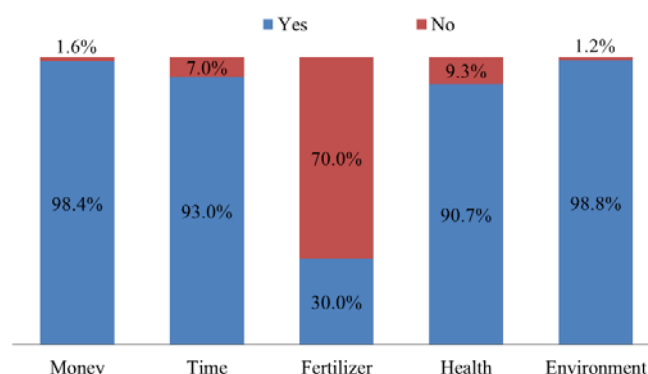


Fig. 3. Perceptions of participating households regarding the effects of biogas digester (BD) installation

Note 1. Number of surveyed households: 257  
 Note 2. Money = cost savings on cooking fuel; Time = time savings associated with reduced time spent on firewood collection and cooking; Fertilizer = use of BD effluent as fertilizer for gardens and ponds; Health = health benefits from avoiding smoke and soot generated from cooking by firewood; Environment = Environmental enhancement by reducing malodors and overcoming poor water quality issues.