

FUEL WOOD CONSUMPTION IN FOUR DISTRICTS OF BANGLADESH

DRAFT REPORT

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1 INTRODUCTION

According to World Bank's Global Tracking Framework of 2017 and WHO factsheet 2016, around three billion people rely on wood or other biomass for cooking and heating, resulting in indoor and outdoor air pollution that causes about 4.3 million deaths each year. More than 50% of premature deaths due to pneumonia among children under 5 are caused by the particulate matter (soot) inhaled from household air pollution (WHO factsheet 2016).

Asia is the region with the highest production of wood fuels, accounting for 771 million m³ or nearly 45% of global production. This is strongly driven by China and India which together consume one quarter of global wood fuel consumption.

Energy consumption has been rapidly growing in Bangladesh over the past two decades. Further, reliance on traditional fuels is high, with over 92% of rural households depending on biomass for cooking (BBS, 2010).

According to Multiple Indicator Cluster Survey (MICS) 2012-2013 conducted by UNICEF (2015), majority of households in Bangladesh use solid fuels for cooking (88.2%); use of wood playing a major role (67.6%). Use of solid fuels is much lower in urban areas (58.3%) than in rural areas, where almost all households (96%) use solid fuels. Around half of urban households (50.5%) and 72% of rural households use firewood for cooking.

The findings from BDHS (2014) suggest that 82% of households in Bangladesh use solid fuel, including wood, agricultural crops, animal dung, straw, shrubs, grass, and charcoal: 50% in urban areas and virtually all (95%) in rural areas. The proportion of households that rely on wood for fuel has increased from 45% in 2011 to 50% in 2014. The increase occurred in both urban (35% in 2011 to 37% in 2014) and rural areas (48% in 2011 to 55% in 2014).

Indoor pollution has important implications for the health of household members. The type of fuel used for cooking, the place where cooking is done, and the type of stove used influence indoor air quality and the degree to which household members are exposed to the risk of respiratory infections and other diseases. According to BDHS (2014), only 15% of households cook in the house; 68% of households cook in a separate building, and 17% cook outdoors. Urban households are much more likely than rural households to cook in the house (28 versus 10%, respectively). According to UNICEF (2015), 21% of households cooked inside house, 58% in separate building and 21% cook outdoors.

According to UN data, fuel wood consumption had been reduced by only 1% from 1990 to 2014 (Energy Statistics Database, United Nations Statistics Division, UNSD). However, around 50% of households of Bangladesh still use fuel wood for cooking (NIPORT 2014) despite the availability of natural gas and recent promotion of LPG. Traditional and inefficient three stone stoves have been the main cooking appliance for cooking (using bio-mass fuel) in Bangladesh resulting in high fuel wood consumption as well as the emissions of toxic fumes. 98 percent of the population in rural Bangladesh continues to cook with traditional biomass-burning stoves.¹ Hence, this traditional cooking system is the major contributor of indoor air pollution in Bangladesh.

¹<https://www.povertyactionlab.org/evaluation/demand-nontraditional-cookstoves-bangladesh> (last accessed 29 December, 2017). Also see World Bank (2011).

The present study contributes to the literature on the extent of use of fuel wood in Bangladesh in several ways. First, it draws a representative sample from four districts of Bangladesh. Second, it measures fuel wood consumption by households randomly selected from these districts by actually weighing it by a measuring scale. Third, it measures fuel wood consumption in two seasons, wet and dry. Fourth, it identifies some socioeconomic factors such as size of the household, income etc that can determine fuel wood consumption in Bangladesh.

1.1 OBJECTIVES

The main objectives of the study are to (a) quantify the consumption of fuel wood by households in the rural and urban areas of four districts of Bangladesh (Barisal, Barguna, Satkhira and Bagerhat) in a statistically representative fashion; and to (b) investigate the relationship of a series of common socioeconomic characteristics of these households with fuel wood consumption.

1.2 STUDY AREA

The administration of Bangladesh is divided into eight major regions called divisions. Each division comprises of several districts. The districts selected for the study are Barisal and Barguna located in the Barisal division and Satkhira and Bagerhat located in Khulna division. All these districts are located in the southwest of Bangladesh.

The study adheres to the definitions of rural and urban environment, upazila, union, village defined by the Bangladesh Bureau of Statistics (BBS) for the Population and Housing Survey in 2011 (BBS 2011). The BBS defines an urban area as a developed area (i) around an identifiable central place, (ii) where amenities like metalized (paved) roads, communication facilities, electricity, gas, water supply, sewerage connections usually exist, and (iii) which is densely populated and a majority of the population involved in non-agricultural occupations.

2 FUEL WOOD CONSUMPTION IN BANGLADESH

Most of the available literature on fuel wood in Bangladesh is mainly focused on extent of use of fuel wood by households rather than estimation of actual amount of fuel wood consumption. For example, in national level data, only the extent of use of fuel wood is available but there is no information on the amount of fuel wood consumption. The Population and Housing Census Report of Bangladesh (BBS 2011) provides information on the percentage of households using various kinds of cooking fuel. It provides information on the proportion of households using fuel wood by districts, region (rural/urban) and tenure status of housing (owned, rented and rent free). Other nationally representative database on energy consumption (e.g., Household Income Expenditure Surveys or HIES, Labour Force Surveys or LFS) only provides the information on number of households using fuel wood. However, only a handful studies focused on the amount of fuel wood consumption in Bangladesh.

According to BIDS household survey on energy demand, the monthly average demand for fuel wood per household was calculated at 98.86 kg (Asaduzzaman, Barnes, Khandker, 2010). Miah, Rashid and Yong shin (2009) estimated the amount of wood fuel consumed in the rural floodplain areas in Bangladesh besides analysing the socio-economic and environmental consequences of fuel wood usage in the traditional cooking stoves. The study

showed that family size, income, amount of food cooked and burning hours significantly affected the amount of wood fuel used. Taking into account different family sizes, the study observed that 4.24 tonne fuel wood were consumed per family per year.

Sohel, Rana, Akhter (2015) attempted to determine the biomass fuel consumption pattern of users of traditional cooking stoves (TCS) and improved cooking stoves (ICS). The sample size was 80 households for each type of cooking stove. 79% of ICS using households stated that they consume approximately 3 kg per day. Only 5% of TCS users reported of this amount of fuel wood consumption. In contrast, 74% of the TCS users said they consume about 10 kg of fuel wood per day, which is the highest percentage between the two groups.

Asik and Masakazu (2017) estimated household fuel wood consumption and factors influencing the consumption of fuel wood of 42 households in Teknaf Peninsula of Bangladesh. The study followed Kitchen Performance Test (KPT) to measure fuel wood consumption of each household where usage was measured by weighing fuel wood. The average annual consumption of fuel wood per person was found 1,168 kg, which is quite higher than other similar studies around the world. Family size came up as the only factor influencing fuel wood consumption.

All the available studies except for Asik and Masakazu 2017 are based on structured questionnaire where fuel wood consumption was estimated through interviewing the households. Hence, the final estimates depended on that reported by the households. Since actual fuel wood use is not measured, the reported use may deviate significantly from the actual consumption. Therefore, a KPT based study can be preferred over interviewing for estimating the actual consumption.

3 METHODOLOGY

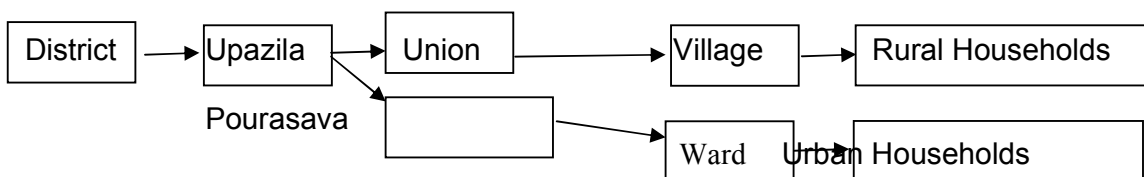
The main steps of the study are as follows:

1. Preparation of the sampling frame
2. Selection of the sample for the study
3. Conducting of KPT during the dry and wet seasons
4. Description of Standard Adult Equivalent

3.1 PREPARATION OF THE SAMPLING FRAME

The target population for this study is all households using firewood for cooking in four districts. A household comprises of members sharing same kitchen. It includes members who are temporarily absent but will return within 6 months. We have excluded visitors and strangers and included any domestic worker if the person eats meals at the house.

The population in a district is subdivided according to the following administrative units:



Thus, a district population consists of four tiers:

- Tier 1: Population of village (rural households) or ward (urban households)
- Tier 2: Population of Union (rural) or Poursava (urban)
- Tier 3: Population of Upazila (rural + urban)
- Tier 4: Population of District (rural +urban)

A multi-stage sampling scheme is followed to select the sample households. A four-stage random sampling scheme is followed in each stage.

- Stage 1. Selection of sample Upazilas from each district: primary sampling unit: (PSU).
- Stage 2. Selection of sample Unions/Pourasava in each selected Upazila (sub-sampling unit (SSU))
- Stage 3. Selection of sample villages/ward from each selected union/Pourasava (sub-sub sampling unit (SSSU))
- Stage 4. Selection of household from each selected village/ward (final sampling unit)

Sample households from each SSSU are selected through a simple random sampling scheme. The information on the distribution of households among the sample units (districts, upazilas and so on) was obtained from the population census of 2011.

Fuel wood consumption by 15 randomly selected households from one village and from one ward in one upazila was done for each district. This information was used to estimate mean and variance of fuel consumption as a basis for determining sample sizes for upazilas, unions/pourasavas, villages/wards. From each village/pourasava required number. of households are selected and interviewed by trained interviewers through visiting each household. The number of households for a district is computed at 5% relative precision with 95% confidence level with the help of following equation:

$$n^* \geq \frac{1.96^2 \times N^* v}{(N^* - 1) \times (0.05)^2 + 1.96^2 v}$$

Where,

$$v = \frac{s^2}{\bar{x}^2}$$

s^2 = Variance of fuel consumption per household estimated based on the preliminary sample from the district

\bar{x} = Mean fuel consumption per household estimated based on the preliminary sample from the district

N^* = No. of households (population) in the district.

1.96 = Represents 95% confidence

0.05 = Represents 5% relative precision

We used probability proportional to size (pps) sampling scheme to determine sample sizes for upazilas, unions, wards and villages using their respective distributions of the households living in these units.

The population census provided the number of households living in a village or ward but the list of households was not available. We also did not know the households that used fuel wood. Thus, in each village/ward, we prepared a list of households before conducting the data collection. The list of households was obtained from the union parishad office and

pourasava. When such list was not available, the list was prepared through focus group discussion or other convenient process.

The households were divided into two parts: (1) users of fire woods for fuel and (2) non-users of fire woods along with names of their fathers or husbands. The list of households (the serial numbers only) were communicated to researchers in Dhaka by SMS and the researchers randomly selected the households and texted the serial numbers back to the field officers. The selected households were finally interviewed.

As the survey was to be conducted in two seasons, it is likely that some households surveyed in dry season may not be available for survey in wet season. Therefore a 5% additional number of households were surveyed in dry season on top of total number of households selected for survey, 621. Total number of households actually to be surveyed in the dry season was 652.

To select these additional households, for villages with sample households greater than or equal to 20, 5% extra households are taken. For rest of the villages in an Upazila, number of households was increased by 5% on total of sample households in those villages in the Upazila, and the additional numbers were distributed among villages with least number of households to be surveyed. This was done instead of adding 5% extra household in each village for every village, as the 5% addition for villages with sample households less than 20 would be less than 1.

3.2 SELECTION OF THE SAMPLE FOR THE STUDY

Table 3-1: Distribution of the sample households

District	Number of Upazilas	Number of Union Parishads	Number of Pourasavas	Number of Rural Households	Number of Urban Households	Total Households
Barisal	2 (Gournadi, Mehendiganj)	5	2	112 (108)	36 (32)	148 (140)
Barguna	2 (Barguna Sadar, Patharghata)	4	2	94 (93)	37 (32)	131 (125)
Bagerhat	2 (Fakirhat, Morrelganj)	4	1	119 (115)	95 (90)	214 (205)
Satkhira	2 (Kalaroa, Shyamnagar)	4	1	113 (106)	46 (45)	159 (151)
Total	8	17	6	438 (422)	214 (199)	652(621)

Note: Numbers in parenthesis represent sample size without extra 5% households.

The data on consumption of fuel wood by the sample households were collected over a period of one year covering the dry and wet seasons to capture variation in fuel wood consumption. The survey for the dry season was undertaken during the months of September through December, 2016. The wet season survey was completed during July-August, 2017. The dry seasons fieldwork took a longer time because the sampling frame had to be developed prior to the actual administration of the questionnaire.

3.3 KITCHEN PERFORMANCE TEST (KPTS)

We used a simplified version of the KPT version 3.0 protocol developed by the Partnership for Clean Indoor Air (PCIA) (Bailis, Smith, & Edwards, 2007) for the KPT. The weight measurement equipment used was small crane with a brand name Mega Company. The crane scale is made in China with a capacity 100 kg.

Four visits were made to each household thereby collecting daily fuel consumption of three days. We estimated the daily consumption of fuel wood as the average of fuel wood consumption of 3 days.

Day 1

1. A stack of fuel wood from the household’s stock was set aside. The respondent was told not to add to the stock for the next three consecutive days.

Days 2 to 4

1. The household was visited at about the same time as on the previous day (to assure that a full one-day’s cycle of cooking was assessed).
2. The remaining stacks of fuel wood were weighed.
3. In case the remaining fuel wood was not enough for the estimated cooking until the end of the test more fuel wood was weighed and added to the stack.
4. In addition to the weighing of the fuel wood the household was interviewed on the number of meals and eaters of the past 24-hour cycle. The age of the eaters was classified into three groups (0-14 years, 15-59 years and over 59 years) and their sex was also recorded.

3.4 STANDARD ADULT EQUIVALENT

We measured fuel wood consumption per adult equivalent. That is, we normalized the members of the households who ate the food because person of different age and sex will consume different amount of food. The “standard adult equivalent” were measured according to the factors suggested by (Joseph, 1990).

Table 3-2: Standard adult equivalents for different gender and age groups (Joseph, 1990)

Gender & age group	Standard adult equivalent
Children 0-14 years	0.5
Women over 14 years	0.8
Men aged 15-59 years	1.0
Men over 59 years	0.8

4 RESULTS AND DISCUSSION

We have estimated fuelwood consumption per household per day, per person per day, per adult equivalent and the number of members in a household. These estimates are presented in Table A-1 through Table A-8 in the Appendix. Based on the results we can conclude whether fuel wood consumption per adult equivalent is a more reliable predictor (i.e. lowest variance/std. deviation) compared to fuel wood consumption per household or fuel wood

consumption per person. This information is also presented in Figure 4-1 and Figure 4-2. We provide the main results below.

Fuel wood consumption does not vary much for most districts in both seasons

We have carried a two-sample t-test to test the difference in means of fuel wood consumption per adult equivalent by districts. In the dry season fuel wood consumption does not vary much between Barisal, Bagerhat, and Barguna but it is much higher than that in Satkhira. Fuel wood consumption in the dry season is the highest in Bagerhat amounting to 1.87 kg/day/AdEq and lowest in Satkhira amounting to 1.25 kg/day/AdEq. In the dry season fuel wood consumption in Barisal and Barguna is the same, 1.80 kg/day/AdEq. In the wet season, fuel wood consumption is also the highest in Bagerhat (2.50 kg/day/AdEq) and lowest in Satkhira (1.99 kg/day/AdEq). In the wet season, fuel wood consumption between Barisal, Barguna, and Satkhira does not vary but they are lower than that in Bagerhat.

Fuel wood consumption does not vary much by location (rural/urban) in both seasons in most districts

We have carried a two-sample t-test to test the difference in means of fuel wood consumption per adult equivalent by location (urban and rural). Fuel wood consumption is higher in Barisal in the urban areas as compared to the rural in both seasons. Urban fuel wood consumption is also higher in Satkhira but only in the wet season. The differences between urban and rural are not very high and major variations can perhaps be better explained by other predictors such as household size.

Fuel wood consumption is higher in the wet season as compared to the dry in all districts and for both rural and urban areas.

There is a clear seasonal variation in fuel wood consumption (Figure 4-3). For example, in urban areas of Satkhira, fuel wood consumption increases by 72% in the wet season. Increase in fuel wood consumption in Satkhira is the largest among all the districts; it increases by more than half in the rural areas during the wet season. The increase in wet season fuel wood consumption is about a third in Bagerhat, about 13% to 14% in Barisal and 12 to 23% in Barguna. We have also carried a two-sample t-test to test the difference in means of fuel wood consumption per adult equivalent by season (dry and wet).

Figure 4-1: Dry season fuel wood consumption (kg/day/AdEq)

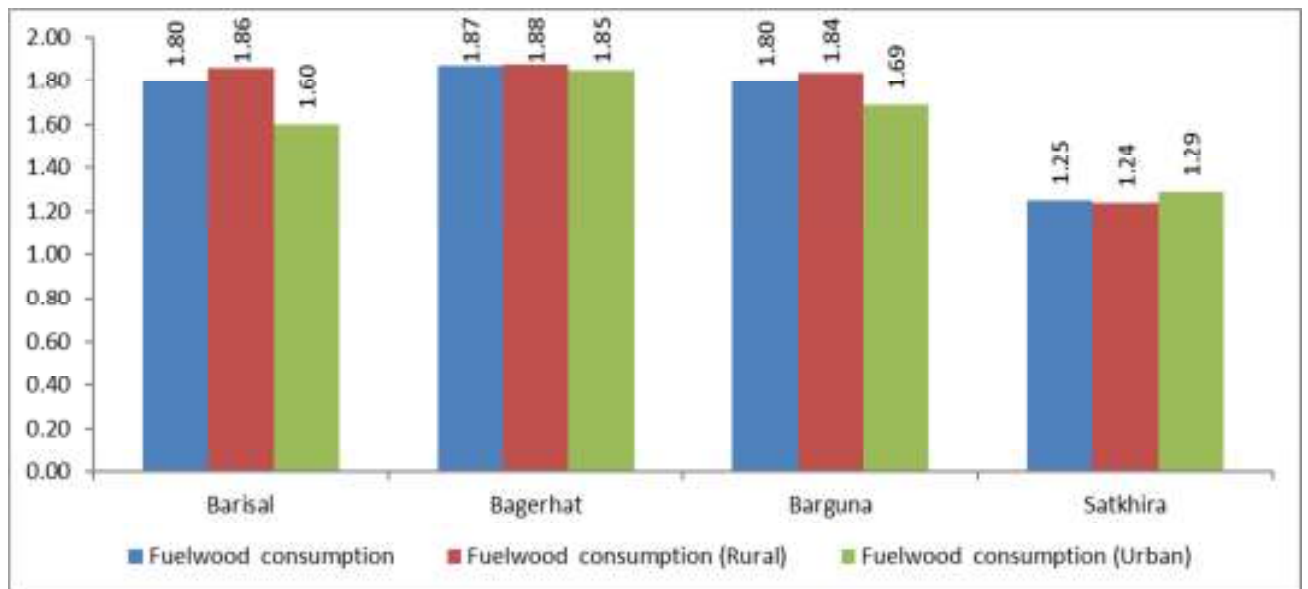


Figure 4-2: Wetseason fuel wood consumption (kg/day/AdEq)

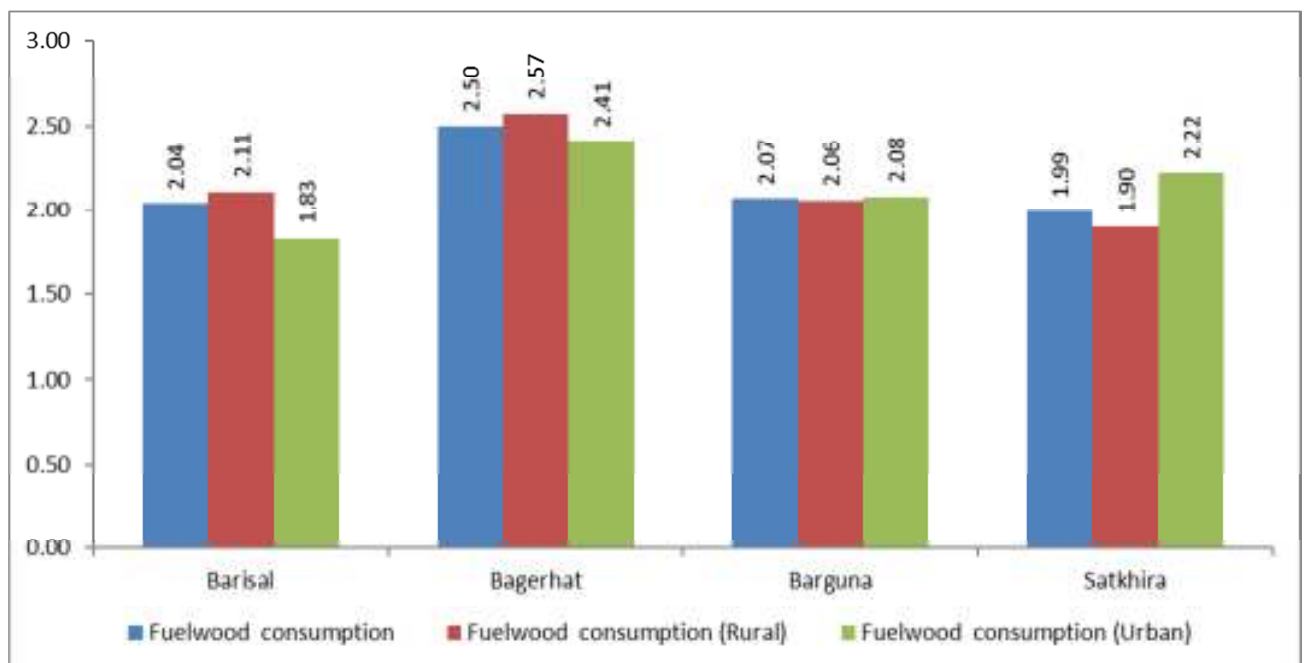
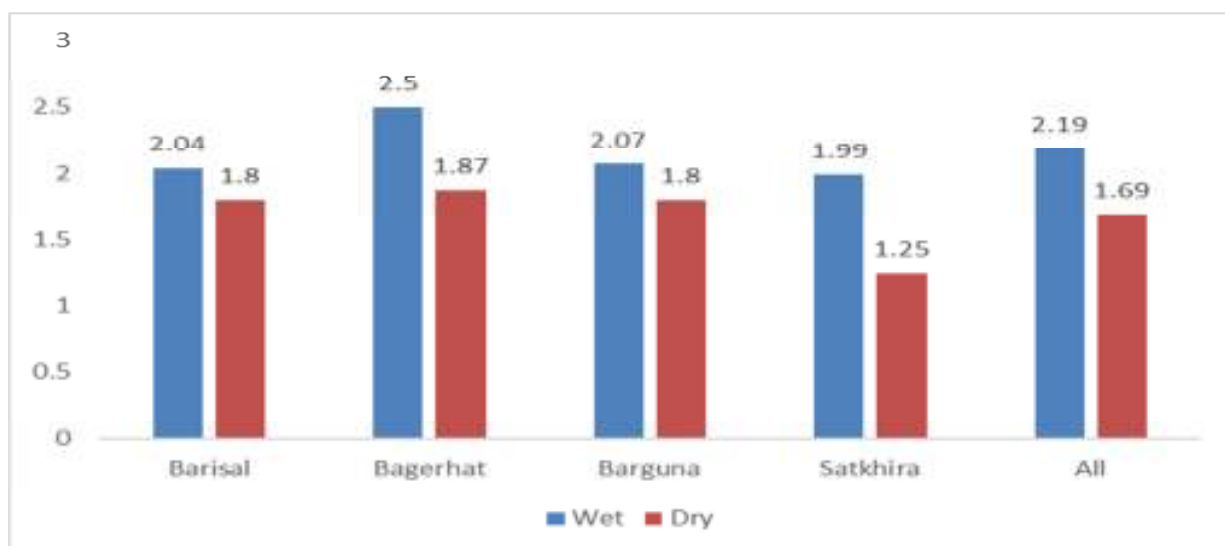


Figure 4-3: Fuel wood consumption in two seasons compared (kg/day/AdEq)



4.1 SOCIOECONOMIC DETERMINANTS OF FUEL WOOD CONSUMPTION

We have found that fuel wood consumption per adult equivalent hardly varies by districts except for Satkhira in the dry season and for Bagerhat in the wet season. We have also found that fuel wood consumption varies less between rural and urban areas. This indicates that there are other socioeconomic variables that may better explain fuel wood consumption in the study districts. This has been established in other studies where it is found that fuel wood consumption varies by household size, income, amount of food cooked (Asaduzzaman, Barnes, Khandker, 2010 and Asik and Masakazu 2017). Below we make an attempt to identify other socioeconomic indicators that might explain variation in fuel wood consumption in the survey areas.

We have estimated pairwise correlation of fuel wood consumption per adult equivalent with household size, education level of the head of the household, income of the household and price of fuel wood. Education level has been categorized into 17 levels. Monthly income of the households has also been classified into 19 groups. These are incomes as reported by the households. For households who collected fuel wood from the forests, price was imputed from those households who bought from the market. The results are presented in Table 4-1.

Table 4-1: Correlation coefficient of socioeconomic variables with fuel wood consumption

	Correlation coefficient (Dry)	Correlation coefficient (Wet)
Household size	-0.2703*	-0.4182*
Education level of the head of the household	0.1248*	0.1541*
Monthly income of the household	-0.0732	-0.2146*
Price of fuel wood	0.1016*	0.0281

* p<.05

Table 4-1 shows that income plays no significant role in the determination of fuel wood consumption as measured by adult equivalent approach in the dry season and price of fuel

wood plays no significant role in the wet season. Household size and education level of the household head significantly determine fuel wood consumption (at 5% level of significance) in both seasons. Our results vindicate the findings of Asaduzzaman, Barnes, Khandker, 2010 and Asik and Masakazu 2017 that size of the household is an important determinant of fuel wood consumption. However, Asik and Masakazu (2017) did not find any significant relationship between education level of the head of the household and fuel wood consumption which this study did.

We then dropped the variables income and price of fuel food and regressed household size and level of education on adult equivalent fuel wood consumption per capita. The results are presented in Table 4-2.

Table 4-2: Regression results

	Dry season		Wet season	
	Coefficient	t-value	Coefficient	t-value
Household size	-.11493344***	-7.28	-.20203372***	-11.92
Education level of the head of the household	.00664434***	3.39	.00943249***	4.48

* p<.05;***p<.001

As can be seen, size of the household is a significant determinant of fuel wood consumption. The relationship is negative, an increase in the size of household decreases the amount of fuel wood consumption in per capita adult equivalent terms.

As shown in Figure 4-4, the results hold for all districts.

Figure 4-4: Relationship between fuel wood consumption and household size

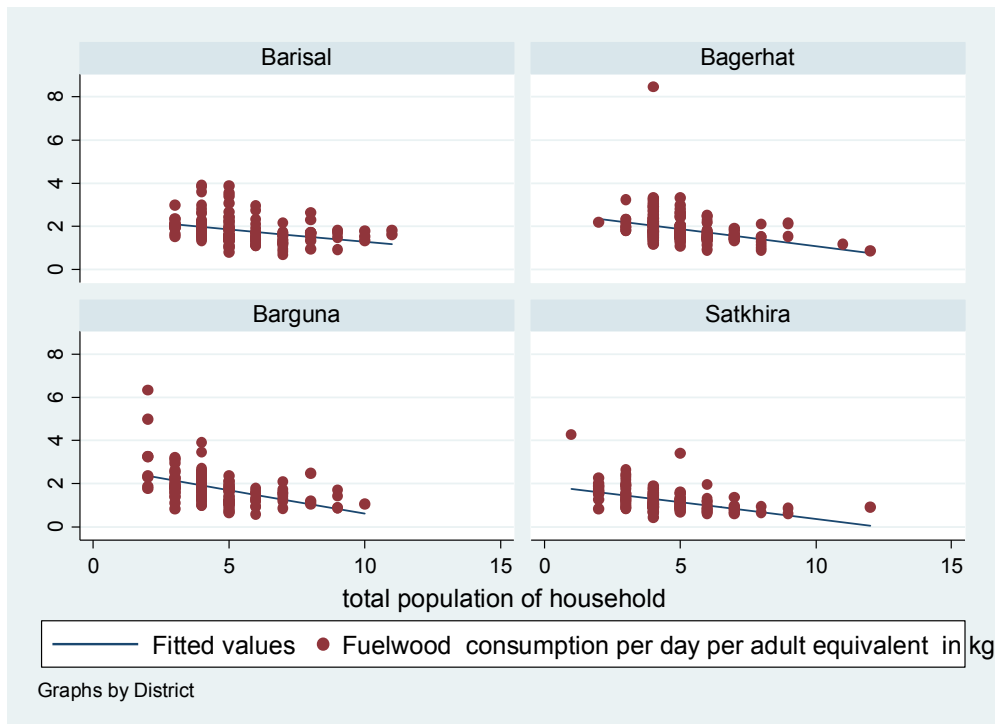
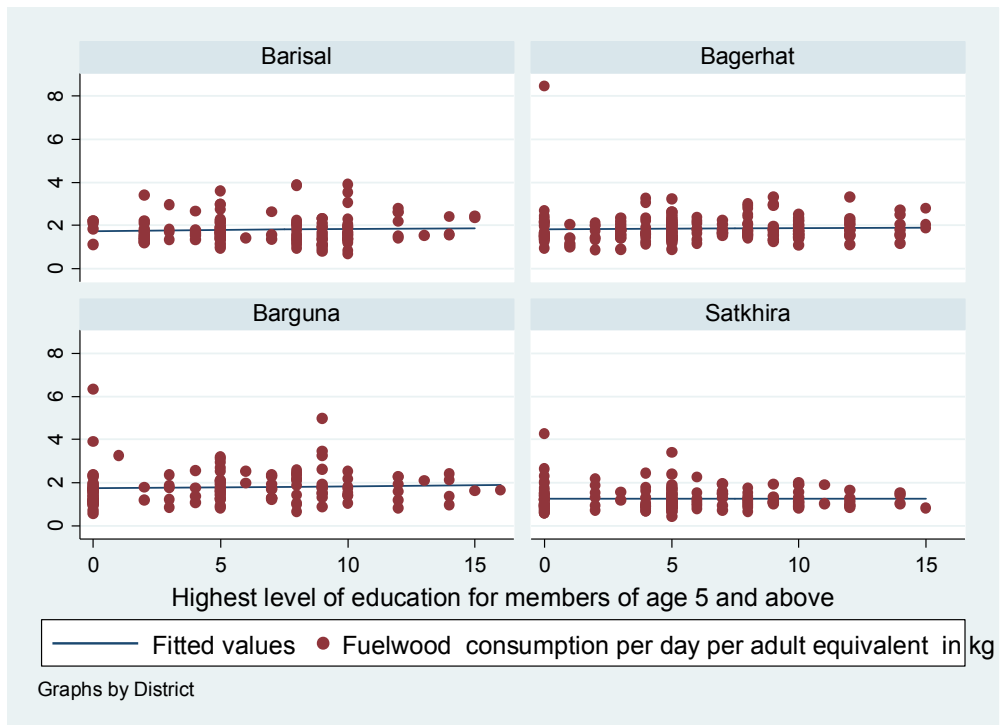


Figure 4-5: Relationship between fuel wood consumption and education



5 CONCLUSIONS

This study estimated fuel wood consumption by the households in four districts in Bangladesh; Barisal, Bagerhat, Barguna, and Satkhira. The survey was carried out on 652 households in urban as well as rural areas. All these households were surveyed in the dry as well as in the monsoon season. We used a multi-stage sampling method to select the households. We have found that fuel wood consumption does not vary much for all districts except for Satkhira in the dry season and Bagerhat in the wet season. Fuel wood consumption also does not vary much by location in both seasons. However, fuel wood consumption is higher in the wet season as compared to the dry in all districts and in both rural and urban areas. We have then looked for socioeconomic indicators that might explain fuel wood consumption. We have found household size and education of the head of the households significantly determine fuel wood consumption.

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APPENDIX

Table A-1: Fuel wood consumption in Barisal (dry season)

	Barisal					Barisal Rural					Barisal Urban				
	No. of Obs.	Mean	Std. Dev.	Min	Max	No. of Obs.	Mean	Std. Dev.	Min	Max	No. of Obs.	Mean	Std. Dev.	Min	Max
Fuel wood consumption per day per HH in kg	148	7.47	2.59	3.67	15.47	112	7.85	2.62	3.67	15.47	36	6.30	2.14	3.70	14.33
Fuel wood consumption per day per person	148	1.40	0.46	0.57	3.22	112	1.43	0.48	0.57	3.22	36	1.28	0.41	0.63	2.60
Fuel wood consumption per day per adult equivalent - kg/day/AdEq	148	1.80	0.60	0.68	3.90	112	1.86	0.61	0.68	3.90	36	1.60	0.53	0.77	3.59
People in the household	148	5.59	1.76	3.00	11.00	112	5.73	1.80	3.00	11.00	36	5.14	1.57	3.00	10.00
Number of adult equivalents in the household	148	4.35	1.39	2.30	8.50	112	4.41	1.43	2.30	8.50	36	4.14	1.25	2.30	8.00

Table A-2: Fuel wood consumption in Barisal (wet season)

Variable	Barisal					Rural					Urban				
	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
Fuel wood consumption per day per HH in kg	148	8.53	2.89	4.83	19.87	112	8.92	2.99	5.07	19.87	36	7.30	2.17	4.83	17.07
Fuel wood consumption per day per person	148	1.59	0.49	0.83	3.28	112	1.62	0.52	0.83	3.28	36	1.48	0.36	1.02	2.61
Fuel wood consumption per day per adult equivalent - kg/day/AdEq	148	2.04	0.64	0.99	4.94	112	2.11	0.68	0.99	4.94	36	1.83	0.47	1.21	3.60

People in the household	148	5.59	1.76	3.00	11.00	112	5.73	1.80	3.00	11.00	36	5.14	1.57	3.00	10.00
Number of adult equivalents in the household	148	4.35	1.39	2.30	8.50	112	4.41	1.43	2.30	8.50	36	4.14	1.25	2.30	8.00

Table A-3: Fuel wood consumption in Bagerhat (dry season)

	Bagerhat					Rural					Urban				
	No. of Obs.	Mean	Std. Dev.	Min	Max	No. of Obs.	Mean	Std. Dev.	Min	Max	No. of Obs.	Mean	Std. Dev.	Min	Max
Fuel wood consumption per day per HH in kg	214	7.05	2.15	3.83	23.67	119	6.90	1.70	3.90	13.95	95	7.24	2.60	3.83	23.67
Fuel wood consumption per day per person	214	1.46	0.48	0.65	5.92	119	1.48	0.38	0.65	2.79	95	1.44	0.59	0.77	5.92
Fuel wood consumption per day per adult equivalent - kg/day/AdEq	214	1.87	0.66	0.87	8.45	119	1.88	0.49	0.87	3.33	95	1.85	0.83	0.89	8.45
People in the household	214	5.03	1.40	2.00	12.00	119	4.83	1.27	2.00	12.00	95	5.27	1.53	3.00	11.00
Number of adult equivalents in the household	214	3.93	1.08	1.80	9.00	119	3.78	0.96	1.80	9.00	95	4.10	1.20	1.80	8.90

Table A-4: Fuel wood consumption in Bagerhat (wet season)

Bagerhat	Bagerhat					Rural					Urban				
	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
Variable															
Fuel wood consumption per day per HH in kg	214	9.35	2.87	3.50	19.50	119	9.35	2.77	4.00	18.67	95	9.35	2.99	3.50	19.50
Fuel wood consumption per day per person	214	1.96	0.72	0.64	6.44	119	2.02	0.67	0.64	4.18	95	1.88	0.77	0.88	6.44
Fuel wood consumption per day per adult	214	2.50	0.88	0.85	7.44	119	2.57	0.86	0.85	5.60	95	2.41	0.91	0.92	7.44

equivalent - kg/day/AdEq																				
People in the household	214	5.03	1.40	2.00	12.00	119	4.83	1.27	2.00	12.00	95	5.27	1.53	3.00	11.00					
Number of adult equivalents in the household	214	3.93	1.08	1.80	9.00	119	3.78	0.96	1.80	9.00	95	4.10	1.20	1.80	8.90					

Table A-5: Fuel wood consumption in Barguna (dry season)

	Barguna					Rural					Urban				
	No. of Obs.	Mean	Std. Dev.	Min	Max	No. of Obs.	Mean	Std. Dev.	Min	Max	No. of Obs.	Mean	Std. Dev.	Min	Max
Fuel wood consumption per day per HH in kg	131	5.89	2.13	1.93	15.45	94	6.14	2.27	1.93	15.45	37	5.25	1.57	2.55	8.17
Fuel wood consumption per day per person	131	1.39	0.64	0.48	5.07	94	1.44	0.70	0.58	5.07	37	1.29	0.44	0.48	2.46
Fuel wood consumption per day per adult equivalent - kg/day/AdEq	131	1.80	0.78	0.59	6.33	94	1.84	0.86	0.71	6.33	37	1.69	0.53	0.59	2.96
People in the household	131	4.58	1.64	2.00	10.00	94	4.64	1.61	2.00	9.00	37	4.43	1.71	2.00	10.00
Number of adult equivalents in the household	131	3.52	1.26	1.60	7.90	94	3.59	1.22	1.60	6.70	37	3.35	1.37	1.60	7.90

Table A-6: Fuel wood consumption in Barguna (wet season)

Barguna	Barguna					Rural					Urban				
	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
Fuel wood consumption per day per HH in kg	131	6.70	1.62	3.23	12.60	94	6.82	1.58	4.57	12.60	37	6.41	1.72	3.23	12.50
Fuel wood consumption per day per person	131	1.60	0.57	0.59	4.23	94	1.61	0.58	0.59	4.23	37	1.57	0.53	0.65	3.23
Fuel wood consumption per day per adult	131	2.07	0.70	0.80	5.28	94	2.06	0.71	0.80	5.28	37	2.08	0.69	0.83	4.03

People in the household	159	4.27	1.53	1.00	12.00	113	4.51	1.60	1.00	12.00	46	3.67	1.14	2.00	7.00
Number of adult equivalents in the household	159	3.38	1.18	0.80	9.20	113	3.57	1.24	0.80	9.20	46	2.90	0.82	1.60	4.90