INNOVATIONS

Household Cooking Fuel Choice: The case of Ambo Town, West Shoa Zone, Ethiopia

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Abstract

Ethiopia lacks access to clean affordable and reliable energy which harms the environment and health of society. This paper aimed to look at the determinant of household cooking fuel choice. Simple random sampling techniques were used. The multinomial logit and the binary logit model were used. Descriptive statics results of the survey show, of the 120 respondents 21.66% use electricity, 58% charcoal, and 2.5. % used kerosene, as a source of cooking fuel. Moreover, about 84.16% of them use a mix of fuel, among them 62.5% use a mix of firewood and charcoal, and about 21.6% of the respondents use a mix of electricity and charcoal. The econometric result shows that gender, education, and the initial cost of utilities are the most important factors that determine a household's fuel choice. Improving current electricity services quality access and affordability educating the public about the benefits and impact of different energy sources.

Key Words:1. Cooking 2. Choice 3. Fuel 4. Energy 5. Household 6.Multinomial logit

1. Introduction

Energy shortage global warming and climatic change are among important issues confronting governments and developmental agencies worldwide. Consequently, there is a shift in governmental policies to increase energy efficiency and to develop low carbon economies (Human, 2011). Hence, the development of renewable energy is demanded increasingly Traditional biomass energy currently make up 77 % of the world's energy conductional (IEA, 2011).

Access to clean affordable and reliable energy is important for economic Development Modern energy sources such as electricity are friendly to environmental health and productivity. Increasing Modern energy supply and making it available for the society is an integral part of the coming energy policy for the (IEA, 2011). However, the high amount of energy used for cooking in developing countries comes from traditional fuels such as firewood, dung, Charcoal, and kerosene (Alemu and Kohlin, 2008). According to the estimated, 2.5 billion people in developing countries depend on traditional biomass fuel to meet their cooking needs. For many countries around 90% of the household's fuel is come from traditional biomass fuel without proposition and implementation of new policies the number of people dependent on biomass fuel is predicted to reach 2.6 billion in 2015 and 2.7 billion in 2030. However, the heavy dependence of households on traditional biomass fuel as a source of energy to cook in developing counties leads to deforestation and soil erosion which results in a reduction of soil fertility ad, in turn, contributes to a decrease in agricultural productivity than less food supply (Alemu and kohin, 2008).

Uses of traditional biomass fuel as a source of energy for cooking have several adverse effects on the environment by leading to deforestation which is the main cause for change that results in global warming as empirical studies revealed that the emission from deforestation account for about 18%of greenhouse effect (Gebreegziabher*et al*,2010). Additionally, utilization of traditional fuel for cooking harms health in the world due to indoor air pollution, and empirical evidence from the world health organization (2006) estimated that 1.5million of women and children died prematurely due to exposure to indoor air palliation from traditional fuels. Despite the adverse effect of traditional biomass fuel uses as a source of energy for cooking society are determined by a different set of factor as empirical evidence reveal to choose between modern and traditional fuel uses. As income increases and urbanization continues modern fuel will become an increasingly important fuel source. Urban dwellers may be forced to take commercial fuels to meet their daily requirements (Mebratu, 2017)). According to Mebratu, only an estimated 12% of the Ethiopian population has access to electricity. With almost 85% of the Ethiopians living in rural areas, there is a significant bias between the power supply of the urban and rural population. Only 2% of the rural but 86% of the urban residents has access to electricity. The overloading of the network frequently disrupts the power supply of large commercial and industrial customers. There is a need for substantial investments in the power system (Birhane, 2016).

2. Statement of Problem

Energy demand is one of the major challenges in developing countries in general and Ethiopia in particular. The stringency of energy demand is high in both rural and urban in recent times due to the rapid growth of population and deforestation which contributed to an increase in the price of energy sources (Gebreegziabhier, 2010). To address the problem that comes from energy demand individuals tried to utilize both modern a traditional energy sources. Even though they diversify their energy source, the recent empirical study reveals that more of total households' fuel consumption in developing countries comes from the traditional biomass fuel (Alemu andKohlin 2008). However, the use of traditional biomass fuel in enveloping countries as fuel expands illegal deforestation which has a detrimental effect on the ecosystem, health, and agricultural productivity (Helen, 2005). Despite this negative effect society is using a traditional energy source. But the reason why society used traditional fuel is unclear. As different empirical studies reveal Social and economic factors determine the society to use a different source of energy.

For instance, Pundo and Fraser,(2006) reveal that education of wife; ownership and type of dwelling unit are a factor that affects the society to choose those sources of fuel for cooking. Helen 2005choice of particular fuel is determined by income, price, location distance, and education. Alemu and Kohlin (2008) income, preferences, supply, cost of fuel, technology and cooking and consumption habit Gebreegziabeher*etal,* 2010 reveal that income, family size, age gender, and education.

For instance, (Muazu N *et al.,* 2020) revealed that education of wife, ownership, and type of dwelling unit is a factor that affects the society to choose those sources of fuel for cooking. According to (Wolde-Ghiorgis, W. 2017), the choice of a particular fuel is determined by income, price, location distance, and education. Additionally, according to (Gebreegziabhier, 2018), income, preferences, supply, cost of fuel, technology, cooking and consumption habit are factors which determine household energy choice.

Even though different research had been conducted by using different methodology regarding the determinant of household cooking fuel choice in a different part of Ethiopia, in our review we had not come across similar studies in the Ambo town context. As a result, we aim to investigate the factors that determine the household to choose a cooking fuel choice at ambo town and recommend policy option

3. Objectives of the Study

The general objective of the study was to identify factors that determine household cooking fuel choice in Ambo town.

Specifically:

- ✓ To identify the public awareness regarding the impact of traditional fuel on the environment, health, and economic development
- ✓ To identify determinants of household cooking fuel choice in ambo town

4. Review of Related Literature

4.1 Theoretical Review

In developing countries, most of the rural communities have less access to modern and clean energy sources mostly them on traditional[1]fuel for their energy requirement (chukwu, 2010). Traditional biomass fuel is the primary source of energy for the majority of the population in Africa. It is estimated that about 2.5 billion people in developing conniption rely on biomass fuel to meet their cooking needs and around 90% of total household fuel consumption is traditional biomass (Bello, 2009; Helen, 2005 Alemu; and kohlin, 2008). with increasing population and urbanization over time, urban household energy is an important issue for developing countries in general heavy dependence of cities households in sub- Saharan African on biomass fuel leads to deforestation and climatic and change (Bello,2009). Consumption of traditional fuels has negative environmental, economic, and healthy impacts. That is increased use of firewood and charcoal leads to deforestation, leaning to ecological imbalance, and increased use of agricultural and anima dug deprives the land of essential nutrient those are necessary for soil fertility. Furthermore, smoke the use of fuelwood and dung for cooking contributes to acute respiratory infections (Gamtessa, 2002). Most of the people in the world use traditional fuel to meet their cooking fuel. without strong new policies to expand access to cleaner fuel and technologies, the number of people in developing counties relying on traditional biomass as their main fuel for cooking will continue to increase as the global population increases (WEO,2006). Without new policies, member people rely on biomass fuel reach 2.5 in 2004, 2.6 in 2015 and 2.7. Million by 2030 as shown in table 2.1 below.

Table .1 People rely on traditional biomass (Million)

Name of country	**Year**		
	2004	2015	2030
Sub –Saharan Africa	575	627	720
North Africa	4	5	5
India	740	777	782
China	480	453	394
Indonesia	156	171	180
Rest of Asia	489	521	561
Brazil	23	26	27
Rest of Latin America	60	60	60
Total	2528	2640	2727

Source: World Energy Outlook (2006) Energy for cooking in developing countries.

Modern[2] cooking fuels are cooking energy source those are environmentally friendly and uses modern appliances for which are designed with energy-saving technology (Nicolai2008).

4.2 Empirical Review

[1] Firewood, charcoal, dung, and kerosene are considered traditional fuel based on their adverse effect

The most empirical study was conducted by using different `methodology regarding the determinant of cooking fuel choices, for instance, research conducted by pundo and Fraser (2006) analyzed from rural Kisumu using a multinomial logit model. The study founded that level of education of wife whether or not household owns dwelling unit and type of dwelling unit are significant variables in determining household cooking fuel choice, according to Pundo and Fraser,(2006) household with educated wife lacked time to collect wood and they switch to modern energy. Empirically, a study conducted by Bello,(2009)found that a part household income, household cooking energy choice also depends upon sociological and other economic factors such as household size, level of education, and price of appliances for particular energy type, this study explained that as household income increase households switch to cleaner fuel. Similarly, the investigation made by Helen (2005) at the national level in Kenya shows that in addition to income fuel price, location of residence distance from fuel source and education is core determinants for household cooking fuel. Generally, societies are determined by a different factor to choose between using modern and traditional energy.

Both the total energy choice level and share of modern sources of energy choice in Ethiopia is one of the lowest in the world. In fact the annual per capita energy consumption is only 0.8 tons of biomass, 20 kW of electricity, and 20 liters of petroleum fuels (Khare D. *et al.,* 2018). Ethiopia is one of the least developed countries in the world. With an average annual income of 120 US$ per capita, approximately 40% of its 85 million inhabitants live below the poverty line Ethiopia has one of the lowest rates of access to modern energy services, its energy supply is primarily based on biomass. With a share of 92.4% of Ethiopia's energy supply, waste and biomass are the country's primary energy sources, followed by oil (6.7%) and hydropower (0.9%) (Akeh G. *et al.,* 2020). Amoah S., (2019) found that household's energy choice and demand for energy in Oromia towns revealed that the use of both traditional and modern fuels. Additionally, he pointed out that multivariate analysis of the energy choice reveals that the probability of choosing traditional fuels in general declines with an increase in income and prices of the traditional fuels whereas it increases with the increase in the prices of the modern fuels.

According to Amoah S. (2019), promoting sustainable development requires evaluating the technical and policy options that will facilitate the adoption and use of energy-efficient and less polluting cooking fuels and practices in Ambo town.

5. Methodology of the Study

5.1. Description of Study Area

The study was carried out in Ambo town which is a capital city of West Shewa zone, Oromia Regional State, Geographically, Ambo town located between 8047-9021'Nand 370-32' E---Ambo tow is 114 km away from Addis Ababa on the main road from Addis Ababa to Nekemte. The town has a mean annual temperature ranging from 23C to 25C and means annual rainfall off 1300mm-1700mm3(Ambo WOREDA CSA, 2009). They have access to infrastructures such as roads, electricity, water, and telecommunication service. Access to electricity is less compared to the demand of society and society uses an alternative source of energy to fill the gap.

5.2 Types, Source, And Method of Data Collection

In this research primary data were collected from 120 sampled households by using both open-ended and close-ended questionnaires. The questionnaires were presented using face to face interview method to the120 respondents. The observation was also be made to augment the result from primary data sources it matches the theoretical part with the practical situation.

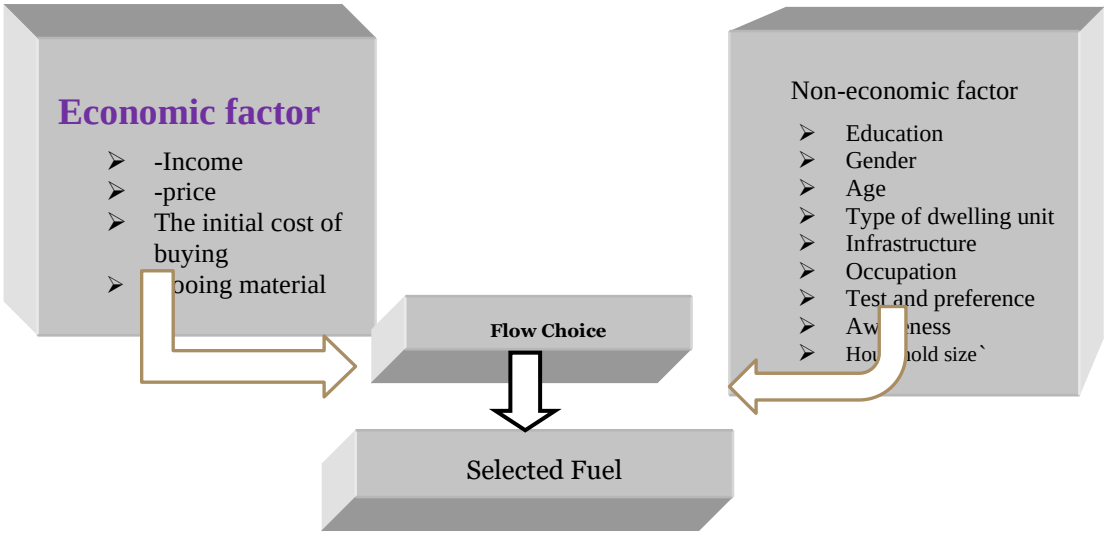
5.3 Sampling Method

A simple random sampling technique was employed to select the household of the study. Due to the homogeneity of the population, only 120 respondents were used for the study. During the random sampling techniques at each household, priority was given to women as we believe that culturally women are more responsible in cooking activities in Ethiopia.

5.4 Method of Analysis

Household fuel choice can be determined by a set of economic and non-economic factors. The economic factors include incomes: price and the initial cost of buying cooking material. on the other hand economic factors includes: education gender, household size ownership of dwelling unit type of dwelling unit, infrastructure, age taste and preference, awareness, and occupation as shown in the conceptual model in figure 3.1 below

Figure 3.1 theoretical models for representation of a socio-economic characteristic of household fuel choice



5.4. 1. Descriptive Statics for Data Analysis

Simple descriptive statics was used to present data in the form of table percentage frequency and mean so data collection was first anal zed by descriptive static and later by econometric model.

5.4.2 Econometric model

To analyze factors that determine household cooking fuel choices the study used a multinomial logit model. The multinomial logit model describes the behavior of the consumer when they are faced with the varieties of goods with common consumption objectives. The choice of the model is based on its ability to with discrete study (Bello, 2009).
However, they must be highly influenced by their individual attributes for example the model example choice between a set of mutually exclusive and highly differentiated cooking fuel such as firewood, charcoal, kerosene, electricity, and dung. If only two discrete choices have to be analyzed the multinomial logit model (Pundo and Fraser 2006). The multinomial logit model that is used in our analysis of data can be expressed as follow

$$\Pr\,(yij/xi = \frac{\mathbf{exp}\,(_{\beta i}\boldsymbol{x_i})}{\sum_{J=1}^{J}\mathbf{exp}^{(_{\beta i}\boldsymbol{x_i})}}$$

Where, pr(yij) is the probability of choosing kerosene, charcoal firewood, or electricity **J** is the number of fuel in the choice set **X**i is a vector of the predictor (exogenous)social (variables)and β is a vector of the estimated parameter Where the logit equation above rearranged using algebra the regression equation is as follow:

$$\boldsymbol{p}i\ = \frac{e(\beta o+\beta_1 X_1 + \cdots + \beta_k X_k)}{1 + e^{C\beta o+\beta_1 X_1+\cdots+\beta_k X_k)}}$$

The equation used to estimate the coefficient

$ln\frac{p}{1-p}\ = \beta_0+\beta_1 X_1 + \cdots +\beta_{1k} X_k + \varepsilon_t$Ln (1−Pи) _ in our study, we use the model with the assumption of reallocation of an alternative set of choice and no change in the price of and fuel attributes. The model also assumes that household chooses fuel that maximizes their utility.

6. Empirical Results Discussion

In this survey first, 120 respondents were presented with socio-economic and demographic questionnaires. Then they were asked to identify their level of knowledge about the impact of the different energy sources (electricity charcoal, kerosene, and firewood) and their preference of these fuel categories to satisfy energy requirements for cooking thus in this section of result and discussion part we present the results of data analysis obtained from the respondents using simple descriptive statistics(frequencies, percentages, and means)as well as using an econometric model –the multinomial logit model.

6.1 Descriptive statistics for data analysis

The general analysis results of the survey show, of the 120 respondents 21.66%use electricity. 57.5% of charcoal and 2.5% use kerosene, as the main source of cooking fuel. Since only three respondents choose the fuel category kerosene, we dropped these observations from the analysis. Accordingly, descriptive analysis of the socioeconomic and demographic characteristic of the respondents indicates, 24 %of the respondents were male and 76 %were female income of the respondents varies from low (about 174 Ethiopia birr) to high (about 40,000 Ethiopia birr) with the majority respondent less than average amount of 299 Ethiopia birr. The age ranges from 20to80 years with an average of 35. In terms of education, 85.47%of the respondents are educated, and 14.53%are illiterate. Family size ranges from 1 to 13, with the average household size being 4.59. Occupationally 74.36% describe themselves as professional's employees and

25.64%as unemployed. Generally, table 4.1 and 4.2 below summarizes the socio-economic and demographic variables used in our study. Descriptive statics such as percentages and frequencies are used to describe/data reused for those variables with the continuous type of data.

Table 2: Socio economic data for continuous Variables

Variable	Mean	S.td Dev.	Min	Max
Age	35.	21.28	20	80
Income	2723.95	432.98	147	40,000
Household-size	4.85	2.73	1	13

Table3: Socio-economic data for categorical variables

Variable	Variable Category	Frequency	percentages
Sex	Male	28	23.93%
	Female	89	76.07%
Education	Educated	100	85.47%
	Uneducated	17	14.53%
Occupation	Employed	87	74.36
	Unemployed	30	25.64%
Owner house(whether Or not the household owns)	Yes	54	46.15%
	No	63	53.85%
Type of house	Modern	49	41.88%
	Traditional	68	58.123%

Moreover, we asked respondents whether they use a mix of fuel for their cooking purpose, not of the sampled household about 84.16%of they use a mix of fuel, among them 62.5%use mix of firewood and charcoal, and about 21.6% of the respondent's' use a mix of electrifying and

charcoal. In this case, firewood is mostly used for baking cultural food " injure" and used for coffee ceremonies and other different cooking purpose. Mover, firewood, and charcoal can be alternatively utilized based on their availabilities in the market. Electricity and charcoal mix is mainly observed for respondents with the high-income group in this case charcoal is mainly used for coffee roasting ceremonies and for being another different cooking purpose to avoid the risk of frequent power outages

To identify the awareness level respond on the impact of the traditional fuel (firewood and charcoal) on their health, Particularly its cause of respiratory disease which have been then main cause of child under 5 years age and adult women deaths in Ethiopia and impact on the environment in terms of its emission of co2 which is main cause climate change. Cutting forests for firewood and charcoal contributes to derogation resources and loss of biodiversity. Accordingly, we asked the respondents whether they know that use of traditional fuel for cooking affects their health and environment. About 84% of the sampled responded know the impact traditional fuel use on their healthy and 83%of the respondent know the impact on the environment as indicated in table 4.3 cross-tabulation of these two data only one individual who is aware of the impact of traditional fuel on health respondent that not of aware of its on the environment, To identify the reason behind this fact, we ask respondent follow up question to reason out objectively why they traditional fuel beside their awareness about its impact. The response to this question is cites for most of the income, lack of dwelling unit and availability of firewood and charcoal at a low price as driving unit to use traditional fuel. The result of this is indicated in table 4.3 below.

Table4: households; awareness about the effect of cooking with traditional fuel on health and environment

	Response	**Frequency**	**Percentage**
Questionnaire about Awareness of health impact	I know the impact	98	83.76%
	I don't know the impact	19	16.24%
	Response	Frequency	Percentage
Questionnaire about Awareness of the environmental impact	I know the impact	97	82.91%
	Idon;t know the impact	20	17.09%

Table 4 indicates 31.66%, 22.5%, and 11.66% of respondents are mainly influenced to use traditional fuel by income, lack of dwelling unit, and availability of firewood and charcoal at low price respectively. The initial cost of utilizes and preference has minimal effect for the household to use as traditional fuel their main cooking source.

Table 5: Reason for using the traditional fuel

Reasons	Frequency	Percentage
Lack of income	38	31.66%
Preference	4	3.33%
The high initial cost of utilities	9	7.50%
Availability of firewood & Charcoal at a low price	14	11.66%
Lack of dwelling unit	27	22. 50%

Furthermore, we asked respondents which fuel source is important to meet the growing cooking energy demand of Ethiopia and safest 94.87 percent of these respondents choose electricity as the most important energy source for addressing the growing cooking energy demand of Ethiopia. Similarly, 97.44 percent of the respondents said electricity the safest source compared to the other fuel sources they were using. Finally, the respondents were asked about the importance of electricity in the base 1-4 Likert-scale (most important, important not important and don't know) for avoiding the health and environmental impact of traditional fuel. 71.79 percent 0f they replied electricity is the most important fuel source to avoid the health risk and environmental impact of traditional fuel.

Table 5 shows the result from the multinomial logit. According to the result, sex has a positive estimated coefficient for both charcoal and electricity and statistically significant at a 10% significance level. The result shows that the females likely to choose electricity than firewood compared to males. That is female likely to choose electricity over firewood is 18.2times than male respondents. Age has a positive estimated coefficient for charcoal though it is not significant. This firewood is a substitute for the firewood when there is no availability of firewood and they have lack of physical strength to collect firewood from the distance. However, age has a negative estimated coefficient for electricity and significant at a 5% significance level.

6.2 Multinomial log it model for data analysis

Table6:Multinomial log it Analysis for fuel Choice among Firewood charcoal and electricity

Variable	**Charcoal**						**Electricity**
	coefficient	p-value	Odd ratio		coefficient	p-value	Odd ratio
Sex	2.56312	0.05***	12.97624		2.902164	0.054***	18.21351
Age	0.0032067	0.890	1.003212		-0.083	0.031**	092082

Education	1.169591	0.459	3.220675		19.3549	0.000*	2.55679
Income	-0.0006138	0.01*	09993864		-0.000871	0.668	0.9999129
House type	-3.892093	0.017**	0.0204026		-5.374535	0.002*	0.0046331
Price of energy source	-2.588125	0.29**	0.0751608		-2.911955	0.023**	0.05433694
Household size	-0.602346	0.009*	0.5475256		-0.865978	0.001*	0.42064
The initial cost of unities	3.584475	0.019	36.03442		4.814349	0.003*	123.266

Here Firewood is considered as base category *, ** and statically significant at 1%, 5%and 10%respectively.

This implies that old-aged households are less likely to use electricity as their principal fuel since electricity the product of recent technology they do not know its importance and they prefer firewood to electricity. Education has a positive estimated coefficient for both charcoal and electricity. However, it is statically significant only for electricity at the 1%significance level. this indicates that education level does differentiate household choice between electricity and firewood while it does not households, likely to choose electricity 2.56 times (increase by 25%) than to choose firewood compared to the illiterate households. Income has a negative estimated coefficient for both charcoal and electricity which is contrary to our theoretical expectation but statistically significant only for charcoal at 1%significace this level. This outcome because of the smallness of the sample size moreover, most respondent s may not tell their true value of income. Type of house has negative estimated coefficient for both charcoal and significant at 5% and 1% significance level respectively. This implies that households with the traditional type of house are more likely to choose firewood as their principal fuel than that of electricity since the traditional house is not favorable to install electricity. Price has a negative estimated coefficient for both charcoal and electricity and statistically significant at a 5%significance level. This implies that households are less likely to choose electricity or charcoal than to use firewood when the price of electricity and charcoal goes up. Household size has a negative estimated coefficient for both charcoal and statically significant statistically significant at 1%significance level. This implies that households with larger family likely to use firewood to cook for many people since it is relatively cheaper and can be collected. Form field firefly and also it is the rate of consumption is slow per time compared to other fuel. The initial cost of utilities has a positive estimated coefficient for both charcoal and electricity and statistically significant a 5%and 1%singificance level respectively. Though it is significant it is very ambiguous to describe since it does not with theoretical expectation.

6.3 Binary logit model for data analysis

For further analysis of our data, the number of respondents was very small for the fuel category of firewood, we dropped the observation for this category and we employed the binary logit model to look at the determinants of fuel choice between electricity and charcoal

Table7: Binary logit Regression analysis result for fuel choice

Variable	Coefficient	p-value	Odd rate
Age	-.090645	0.035**	.9111478
Income	.0006184	0.002**	1.00064
House type	-1.547532	0.039**	.196725
House ownership	1.663144	0.040**	5.417423
Household	-2.97641	0.056*	.7394697
constant	2.59535	0.164	-

***, **, and *** are statistically significant at 1% ,5%and 10% significance level respectively**

Table 4.6 shows a binary log it is an analysis of electricity and charcoal. In this section, firewood has been dropped from the analysis because comparatively few households choose it as their preferred cooking fuel. From the result of logit model analysis, age has a negative estimated coefficient and statistically significant at a 5%significance level. This show that old aged household has less probable to shift from use of charcoal to electricity. That is holding the other variables constant, the probability of households to choose electricity over decreases by 8.85% when the age of the respondent goes up by one year. Income has a positive estimated coefficient which is expected and statistically significant at a 5% significance level which is in line with the expectation. This implies that as income level increase the population tends to use modern fuel since it is expected result it matches this indicates holding the other variables constant, the likelihood of household to choose electricity over charcoal increase by 0.06%income of the respondents by one unit. House type have negative estimated coefficient for charcoal and statistically significant at 5%significance level this implies that household with traditional house uses charcoal for cooking compared to electricity since they have no favorite place to install electricity. Household size has a negative estimated coefficient for charcoal and statistically significant at a 10% significance level. This indicates that households with larger family size likely prefer charcoal for cooking than electricity. That is holding other determinants /variables constant the probability that household choose electricity over charcoal goes down by 26.05% if their family size increase

In general, analysis using the binary logit model will provide us a better estimation of the determinate of household fuel choice and strong goes with the theoretical implications of the

selected variable. This more probable more respondent in our data is those households whose main cooking fuel components electricity.

7. Conclusion and Recommendation

This study aims to analyze determinant of household cooking fuel choice in the Ambo town, Descriptive statistics and econometric model was employed to identify the determinant of energy for cooking as well as sociological and economical and variables influencing major energy in the Ambo town Empirical investigation revealed that: income, price of energy sources education and type of house, and household size are important variable which determines households to use particular cooking fuel for the majority of household in Ambo town. The dependence of households for cooking on fuel wood in the Ambo town has a far-reaching implication on the environment: deforest ion, soil erosion, and diction and declining in agricultural productivity as well as loss in natural habitat.

Based on the result of the study we suggest that beyond improving the holding income policy design should need to focused on the factors that have an impact on households' fuel choice, for instance, improvement of household, income, and education enhances the likely hood of the household modern energy consumption. This will help reduce the consumption of wood implying a reduction in the pressure of wood resources and contributing towards deforestation. Furthermore, measures should be taken be by ambo municipality to gather with Ethiopian energy sector authorities to develop and promote renewable, clean technologies to reduce the burden of economic activity on the ecosystem and thereby reduce pollution. Moreover, to ensure the use of modern, Ambo municipality should have to take the following measurement by teaching the society about the importance of using modern energy sources and the detrimental effect of traditional fuel to both health and environment by make electricity both accessible and affordable in terms of cost and availability for poor household as well as promote other clean and less carbon-emitting alternative form of energy to traditional fuel such as solar energy and biogas.

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