

## Factors that Hinder Effective Domestic Energy Management Practices within Households of Urban and Rural Areas of Abia State

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### **Abstract**

The study investigated the factors that hinder effective Domestic Energy Management Practices (DEMP) within households of urban and rural areas of Abia State, Nigeria. Specifically, the study identified the different types of domestic energy utilized within the households. It also determined the factors that hindered effective Domestic Energy Management Practices (DEMP). Two research questions and one hypothesis tested at 0.05 level of significant guided the study. The study adopted the descriptive survey research design (DSRD). The study was carried out in Abia State of Nigeria. The population of the study comprised of 442,693 households in the study area. The sampling size was 400 households which were purposively drawn from the population). Questionnaire and FGD were used for data collection. The instruments were face validated. Cronbach alpha reliability, Coefficient index was used to determine the internal consistency of the instrument. The internal consistency of the instrument yielded an overall coefficient of the 0.91. Data were analyzed using means for the research questions and Anova were used to test the hypothesis at 0.05 level of significance. The scheffe's post hoc test was used for comparison of means of the items that were significantly different. The findings include 12 types of domestic energy including electricity, kerosene, coal, charcoal and 22 factors that hinder effective domestic energy management practices within households of urban and rural areas of Abia State. Recommendations were made based on the findings of the study that when these factors are successfully handled domestic energy management will be easy and this will lead to the happiness of the individuals in the households and larger society.

**Keywords:** *Factor, Domestic, Energy management, Practices, Households.*

### **Background to the Study**

The importance of energy to human life can never be over-emphasized. Energy is derived from a Greek word *energeia* which means activity, active or works (Merriam-Webster, 2003). According to Bellany (2007), energy is the capacity to perform work or to transfer heat, while Mish (2010), stated that energy is the capacity of acting or being active. He also opines that it may be useable power (as heat and electricity or it might mean the ability to exert effort). Isaac (2005) stated that energy is a property of a system that enables it to do work, that is to move from the point of application of a force. However, according to him, the several forms of energy can be converted into each other under appropriate conditions, for instance, kinetic energy is stored energy, for example the energy stored in the body by virtue of its positions in a gravitational or electric field. Parnell (2004), asserted that energy is something that gives a machine the power to perform an action, He also observed that there are many different kinds of energy; light energy, heat energy and electrical energy. He further stated that energy can be stored on a gasoline which may be harnessed by burning the gasoline in an engine. He also observed further that energy stored in batteries will power a radio and some home appliances. Energy generally exists in many different forms like kinetic, potential and chemical energy. Hughes (2005) stated that there are other alternative sources of energy and that alternative energy comes from the sources like solar power, wind power, water power, geothermal energy and plant power.

Domestic energy is one of the forms of energy. It is one of the most important utilities households needs to achieve their goals. It is the energy used in the home on the various appliances used within the households. For this study, domestic energy is the energy applied for various purposes in the households including cooking, cooling the space, lighting, water heating, powering appliance, laundry, sterilization among others. According to Seith, (2008) & Iloeje (2002), domestic energy is used and coordinated in the households for cooking, lighting, ironing, heating, cooling the space, powering appliances among others. This means that the households needs to cook their foods, light their light at will, cool the environment when it is hot, power the numerous appliances in the home with the available domestic energy. So the ability of any household to survive depends on its continuing access to domestic energy in appropriate quantities, qualities and its acceptable costs and this will in variable affect the hope and happiness of the household members. Domestic energy management is the effective use and control of domestic energy to achieve definite goals with maximum efficiency.

Management of domestic energy is the ability of the homemakers to apply the components of management in the utilization of domestic energy. Homemakers are responsible for managing the most basic resources –domestic energy. The utilization of domestic energy encompasses deciding on the energy available for consumption, how to purchase or obtain what to use, rather it requires decision making. A decision involves a choice between two or more alternative actions or behaviour (Peter & Olson, 2010). Decision making is the action of choosing from among alternative causes of action (Anyakoha & Eluwa, 2010). Moreover, making decisions on which domestic energy to utilize entails considering the various needs for such energy as well as resources available for its provision and the factors that affects its availability.

It has also been observed that most households involved in the use of domestic energy are usually associated with in competencies in the management of domestic energy as a result of a number of factors such as lack of skill, energy price, availability, income, educational status, ignorance, lack of good communication, age of family members. These in competencies in the management of domestic energy affect the wellbeing of the household members.

Subsequently, some factors still weaken the management of domestic energy within households and these has significant consequences for coping capabilities including the ability to adequately care for the members of the households. The understanding and proper handling of these factors which are threats to the management of domestic energy will improve the management procedures within rural and urban households. The enhanced domestic management may result to a higher living standard which invariably will lead to the substance of the household. Also Food and Agricultural Organization(2005), observed that domestic energy management practices are affected by several factors like education level, employment status, location, income, price, size, habits, cultural practices, poverty, type of housing unit, availability and level of urbanization. In addition, Kaputu (2012) observed that there are many factors that determine the domestic energy management of households among them are building design, number and size of appliances, number of occupants and life style.

### **Objectives of the Study**

The main objective of the study is to investigate the factors that hinder effective domestic energy management practices within households in rural and urban areas of Abia state. Specially, the study;

1. Identify the types of domestic energy utilized in Abia state.
2. Determined those factors that hindered effective domestic energy management within households in urban and rural areas of Abia State.

### **Research Questions**

This study answered the following research questions,

1. What are the types of domestic energy utilized in Abia state?
2. What are those factors that hinder effective domestic energy management practices within households of rural and urban areas of Abia State?

### **Hypothesis**

The following null hypothesis was tested by the study at 0.05 level of significance.

**Ho:** There is no significant difference in the mean opinions of large family size and small family size on the factors that hinder effectives domestic energy management practices within households in rural and urban areas of Abia State.

### **Design of the Study**

This study adopted descriptive survey research design (DSRD) to find out factors that affect domestic energy management practices of households in Abia State. The descriptive survey research design elicited opinions of urban and rural households, male and female, literate and non-literate household members. This is consistent with Uzoagulu (2011), and Osuala (2004), who stated that in descriptive research, data are usually collected, organized, analyzed

and described as they exist without interfering with them. They further stated that descriptive survey research design focuses on people, opinions, attitudes, motivation and behavior. Also, Osuala (2004), observed that survey research deals with the present and it is oriented towards the determination of the status of a given phenomenon rather than towards the isolation of causative factor.

### **Area of the Study**

The area of the study was Abia State. Abia State has three senatorial zones namely; Abia Central, Abia North and Abia South. Abia Central and Abia South are made up of 6 Local Government Areas respectively, while Abia North has five making up to 17 LGAs on the whole (Abia State Independent Electoral Commission, 2003). Abia State has a mixed economy of both public and private enterprises. They are mostly traders, farmers and civil servants with various educational backgrounds and mostly Christians. They are more urban dwellers than rural dwellers because of the essential amenities of life deposited in the urban areas (National Population Commission, 2006). This state is located in the South-Eastern part of Nigeria. It is thickly populated. It is endowed with human and non human resources which domestic energy is one of them, with a mix economy of public and private enterprises and various educational and economic institutions. The choice of the area is to allow the factors that affect domestic energy management practices for households residing in rural and urban settings to be observed. Secondly, it has a proper urban and rural setting and has a high population density. It was also selected because it is assumed that individuals from different parts of the country are resident in both rural and urban areas of the state. It is bounded in the North by Enugu State, in the east by Ebonyi and Cross River States, in the South by Rivers and Akwa Ibom and in the West by Imo State.

### **Population for the Study**

The target population for the study consisted of households in Abia state. A typical household is made up of husband, wife, children and other persons. Each household occupies a single housing unit and utilize domestic energy. Available records indicate that there are 442, 693 households in the area of the study (National Population Commission, 2006). The homemakers in the households were the respondents for the study.

### **Sample and Sampling Technique**

The sample for the study was 430 households for the questionnaire and the focus group discussion session. Firstly, Taro Yamen formula for finite population was used to determine the number of households (Uzoagulu 2011) Multi-stage sampling technique was used for selecting the households. At the second stage, the three senatorial zones were used since it is only three of them. These zones have the characteristic features of urban and rural areas. Abia central and Abia South have well planned urban towns with outlined streets and houses. Abia North has towns and more of a typical rural setting with hamlets or compounds. A compound is a fenced or walled-in area containing a group of residential buildings. Abia central and Abia South has six local Government areas respectively, while Abia North has five, giving a total of 17 Local Government Areas. At the third stage, one Local Government Area was purposely selected from each zone. These also gave 3 LGAs. Each of the 3 LGAs was represented by a town which was the headquarters of the zone and a village.

At the fourth stage, systematic random sampling was employed to select every 5<sup>th</sup> street and every 5<sup>th</sup> house in the street. There are 75 streets in Umuahia Town, 160 streets in Aba main Town and 38 compounds in Ebem, Ohafia main Town (Abia State Town Planning Authority, 2012). This gave Umuahia 15 streets, Aba Town 32 streets and Ebem Town 8 compounds, giving a total of 55 streets on the whole. The homemakers represented each household unit. 30 homemakers were used for the focus group. Discussion for both urban and rural areas while 400 homemakers were used for the questionnaire and these gave a total of 430 homemakers for the study.

### **Instrument for Data Collection**

Two sets of instruments were used for the study. The instruments for the study are Domestic Energy Management Practices questionnaire (DEMPQ) that was developed through extensive literature review based on the purposes of the study. The DEMPQ was divided into two major sections A and B. Section A elicited demographic data of the respondents. Section B consisted of information based on the domestic energy management practices within households and structured along a four-point rating scale type of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). The respondents were requested to indicate the extent of their agreement or otherwise with each of the items, numerical values of 4, 3, 2 and 1 were assigned to positively stated items and in reverse order for negatively stated items and a Focus Group Discussion guide (FGD).

### **Validation of the Instrument**

The instrument (DEMPQ) and FGD questions were both face-validated by three experts from the Department of Vocational Teacher Education, University of Nigeria Nsukka. They were requested to vet items for clarity and appropriateness of the items in measuring what they are set to measure. Their comments and suggestions were incorporated in the final draft of the questionnaire.

### **Reliability of the Instrument**

Reliability of an instrument is the consistency with which the instrument measures what it purports to measure (Uzoagulu, 2011). The reliability of the instrument was determined using test-retest reliability method. The questionnaire was administered to 30 homemakers who responded to the question items. The essence is to identify how homemakers reacted to the questionnaire. Whether the items are clear enough and easy to understand or whether there are some items to which they were not likely to respond to. These 30 homemakers used for the test-retest reliability were not part of the main sample of the study. To establish the reliability of the instrument, Pearson Product Moment Correlation was used. The mean responses were used to calculate the Pearson Moment Correlation coefficient of the different sections of the questionnaire. The mean responses were summarized and the reliability estimate was determined using the Cronbach-alpha reliability index to determine the internal consistency of data collected. Also Cronbach-alpha was used to ascertain that the reliability test is completely tested and have a clear result. The reliability coefficient of 0.91 was obtained which suggested that the internal consistency of the instrument was very high.

### **Method of Data Collection**

Data collection was done in two phases, first a questionnaire was used to answer the research questions and hypotheses were tested. Four hundred copies of the instruments (DEMPQ) were administered with the aid of three research assistants. The research assistants were properly trained by the researcher. The DEMPQ were distributed by hand by the researcher and the research assistants. The respondents were expected to fill and return the questionnaire immediately to the researcher and research assistants as the case may be. The (DEMPQ) questionnaire items were explained to ensure that the respondents understood the questions. Three hundred and fifty-five (355) copies of DEMPQ were completed correctly and returned which represented 89% return.

Secondly, Focus Group Discussion (FGD) session was used to answer the questions on uses, types of domestic energy, planning, controlling, evaluation, factors and ways to improve domestic energy management practices within urban and rural households. The FGD was held in Ndioro Oboro in Ikwuano LGA at 5pm and Umuahia Metropolitan City at 5pm also. The timing was to ensure that it does not encroach into their daily activities. It has 15 participants each and the participants were homemakers who were females by virtue of the Abia state culture and traditions. They had families ranging from 2 and above and the discussion was carried out in the halls (Obu). Four research assistants and the researcher acted as facilitators in the FGD session. The discussion was brief to maintain their interest and attention. There was a question section where the homemakers asked questions which was answered by the facilitator. The medium of communication was a mixed language of Ibo and English language for ease of understanding by all. There was light refreshment at the end of the discussion. Effort was also made to ensure that all the participants contributed in the discussion. A Focus Group Guide developed by the researcher, based on the purposes of the study was used. The discussion was recorded with notes, video recorder and camera. This helped in getting all that was discussed. The FGD was descriptively analyzed and presented in the findings of the study.

### **Method of Data Analysis**

Data were analyzed using mean, t-test and Analysis of Variance (ANOVA). Mean was used to answer the research questions one to eight. A mean rating of 2.50 and above was accepted while items below 2.50 were rejected. t-test was used to answer null hypothesis one ( $H_0$ ) and tested at 0.05 level of significance. The FGD (qualitative) information was organized and summarized based on the research questions.

### **Findings for the Study**

The following findings were made: Focus Group Discussion (FGD) and questionnaire revealed the specific types of each domestic energy and factors that hinder effective domestic energy management practices. The findings of the study revealed;

1. 12 types of domestic energy utilized in Abia State.
2. 22 factors that hinder effective domestic energy management.

**Table 1: Mean score of response of Homemakers on the Factors that Hinder Effective Domestic Energy Management Practices within Households of Abia State**

S/No	Factors that Hinder effective domestic energy management practices within households	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_G$	SD	Remarks
<b>General Factors for all Sources of Domestic Energy</b>							
1	Money at hand	3.26	3.39	3.52	3.31	0.89	A
2	Cost of domestic energy	3.38	3.30	3.52	3.36	0.74	A
3	Lack of availability of domestic energy,	3.23	3.31	3.58	3.27	0.75	A
4	Educational level of household members	3.05	3.02	3.05	3.04	0.93	A
5	Age of household members	3.10	2.93	3.05	3.04	0.85	A
6	Stage of the family cycle	3.12	2.98	3.23	3.08	0.87	A
7	Geographical location of household	3.10	3.02	3.23	3.08	0.85	A
8	Lack of awareness	3.31	3.22	3.11	3.27	0.79	A
9	Ignorance of the people	3.25	3.24	3.41	3.25	0.81	A
10	Habit formation	3.21	3.22	3.35	3.22	0.74	A
11	Size of the household	3.14	3.39	3.29	3.23	1.80	A
12	Quality of some domestic energy	3.22	3.31	3.29	3.25	0.79	A
13	Lack of skill	3.21	3.16	3.47	3.21	0.78	A
<b>Peculiar factors that hinder Coal, Charcoal, Fuel-wood Energy Management</b>							
14	Habit formation	3.25	3.16	3.41	3.23	0.72	A
15	Cultural influences	2.96	2.94	3.47	2.98	0.85	A
16	Weather conditions	3.12	3.18	3.29	3.15	0.75	A
17	Believe of the people	2.76	2.70	3.05	2.76	0.97	A
18	Customs and tradition	2.71	2.77	3.05	2.75	1.07	A
<b>Peculiar factors that hinder Kerosene Energy Management</b>							
19	Quality of domestic energy	3.24	3.13	3.35	3.21	0.80	A
20	Shoddy attitude of marketers	3.22	3.08	3.29	3.17	0.72	A
21	Lack of appropriate equipment	3.18	3.14	3.35	3.17	0.79	A
22	Careless attitude	3.23	3.16	3.17	3.20	0.75	A

**Key:**  $N_1 = 219$ ,  $N_2 = 111$ ,  $N_3 = 17$ ,  $X_1 =$  Small Size Families (SSF) (2-5)  $X_2 =$  Medium Size Families (MSF), (6-8),  $X_3 =$  Large Size Families (LSF) (9 – above),  $X_G =$  Grand mean, SD = Standard Deviation.

Table 1 shows the mean distribution of the opinions of the respondents on the factors that hinder effective domestic energy management practices within households. Table 1 has three sub-units, general factors, specific factors that hinder fuel wood and specific factors that hinder kerosene/LNG energy management. Under the general factors items 1-13 had mean range from 3.04 -3.31 indicating that they were all accepted by the respondents as the general factors that hinder effective domestic energy management.

Meanwhile the specific factors that hinder fuel wood energy management had 5 items and they were all within the mean range of 2.73 – 3.23 indicating that these items were agreed by the respondents as the specific factors that hinders fuel wood energy management. Also the kerosene/LNG specific factors that hinder kerosene/LNG energy management had 4 items and they were within the mean range of 3.17 – 3.21 indicating also that they were equally accepted by the respondents as specific factors that affect kerosene/LNG domestic energy management. These are therefore regarded as factors that hinder effective domestic energy management within households in Abia State. A cluster mean of 2.99 was obtained for table 1 indicating that the factors were accepted by the respondents as the factors that hinder effective domestic energy management practices within households. The standard deviation ranged from 0.72-1.80. This means that the respondents were close to one another in their mean responses.

The findings from the FGD revealed the following factors that hinder effective domestic energy management such as: Lack of finance, time factor, trekking long distance to fetch, purchase domestic energy, weather condition, incessant power failure in the state, health condition of family members, carelessness of household members, no helping hand, scarcity of domestic energy, number in the household, culture of the people.



**Table 2: Analysis of the responses of the opinions of Large Family Size, Small Family Size Homemakers on the factors that hinder effective Domestic Energy Management Practices within Households in Urban and Rural Areas of Abia State**

S/N	Factors that hinder effective Domestic Energy Management Practices	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_G$	SD	F-value	Sig of F	Remarks
<b>General Factors for all Sources of Domestic Energy</b>									
1	Money at hand	3.26	3.39	3.52	3.31	0.89	1.27	0.28	NS
2	Cost of domestic energy	3.38	3.30	3.52	3.36	0.74	0.90	0.40	NS
3	Lack of availability of domestic energy	3.23	3.31	3.58	3.27	0.75	1.95	0.14	NS
4	Educational level of household members	3.05	3.02	3.05	3.04	0.93	0.03	0.96	NS
5	Age of household members	3.10	2.93	3.05	3.04	0.85	1.43	0.25	NS
6	Stage of the family cycle	3.12	2.98	3.23	3.08	0.87	1.30	0.27	NS
7	Geographical location of households	3.10	3.02	3.23	3.08	0.85	0.58	0.56	NS
8	Lack of awareness	3.31	3.22	3.11	3.27	0.79	0.84	0.43	NS
9	Ignorance of the people	3.25	3.24	3.41	3.25	0.81	0.32	0.72	NS
10	Habit formation	3.21	3.22	3.35	3.22	0.74	0.28	0.75	NS
11	Size of the household	3.14	3.39	3.29	3.23	0.80	0.69	0.49	NS
12	Quality of some domestic energy	3.22	3.31	3.29	3.25	0.79	0.43	0.64	NS
13	Lack of skill	3.21	3.16	3.47	3.21	0.78	1.15	0.31	NS
<b>Peculiar factors that hinder Fuel-wood Domestic Energy Management</b>									
14	Habit formation	3.25	3.16	3.41	3.23	0.72	1.00	0.36	NS
16	Weather conditions	3.12	3.18	3.29	3.15	0.75	0.53	0.58	NS
17	Believe of the people	2.76	2.70	3.05	2.76	0.92	0.98	0.37	NS
18	Customs and traditions	2.71	2.77	3.05	2.75	0.07	0.84	0.43	NS
<b>Peculiar factors that Hinder Kerosene Energy Management</b>									
19	Quality of domestic energy	3.24	3.13	3.35	3.21	0.80	0.99	0.37	NS
20	Shoddy attitude of marketers	3.22	3.08	3.29	3.17	0.72	1.59	0.24	NS
21	Lack of appropriate equipment	3.18	3.14	3.35	3.17	0.79	0.52	0.59	NS
22	Careless attitude	3.23	3.16	3.17	3.20	0.75	0.34	0.71	NS

**Key:**  $N_1 = 219$ ,  $N_2 = 111$ ,  $N_3 = 17$ ,  $X_1 =$  Small size family (2-5)  $X_2 =$  Medium size family (6-8)  $X_3 =$  Large size family (9 – above), SD = Standard Deviation, F = is significant at sig of  $F < 0.05$ , F-value = ANOVA

Table 2 reveals that there was no significant difference in the mean response rating of large family size (LFS) and small family size (SFS) homemakers on all the 22 items on the factors that hinder effective domestic energy management practices (DEMP) within households. These recorded calculated F-values of less than the table F-value of 3.15 at 0.05 level of significance at 2 and 347 degrees of freedom. This therefore means that the null hypothesis of no significant difference is upheld in all the instances for item numbers 1 to 22.

These are as follows;

**Electricity:** Cooking, lighting, powering appliances, charging phones, ironing clothes, blending foods, mincing foods, mixing foods, refrigerator/freezer, cooling the house, warming the room, Air conditioner, sewing, among others.

**Uses of Petrol (Fuel):** Powering generators set, clearing clippers, checking reptiles around the home.

**Uses of kerosene:** Lighting, cooking, baking, disinfectant, lighting fuel wood, burning of refuse.

**Uses of coal/charcoal:** Cooking, ironing, heating the room, roasting foods, drying foods, baking foods, steaming foods.

**Uses of Fuel wood:** Cooking, baking, ironing, drying foods, roasting foods and steaming.

Factors that hindered effective domestic energy management practices. General factors for all sources of domestic energy: money at hand, cost; lack of availability, educational level, age of members, stage of family cycle, lack of awareness, ignorance, habit, cultural influences, weather, time, believe of the people, customs and tradition, peculiar factors (Kerosene): quality, shoddy attitude of marketers, lack of equipment and careless attitude.

### **Discussion of Findings**

The findings showed that the 22 factors that hindered effective domestic energy management practices within households were accepted by the respondents. It can be deduced that there are many factors that hinder effective domestic energy management practices within households. This therefore indicated that these factors were considered appropriate and relevant for managing domestic energy within households in rural and urban areas of Abia State for the sustenance of household members. This is in-line with Kaputu (2012), who observed that there are many factors that determine the domestic energy usage of a household; among them are building design, number and size of appliances, number of occupants and life style. This is also consistent with Lawer (2000), Odigie (2005), and Hawkins and Mothers bough (2010), who had differently noted that education is a factor that hinders effective domestic energy management. They further stated that low literacy has many negative consequences for households in terms of making bad choices, paying too much and being taken advantage of by unscrupulous marketers because ignorance begets poverty and poverty begets ignorance in a vicious cycle. Similarly, Bacon *et al.*, (2010), Ogwo and Nnolin (2008), Farsi (2007), and Heltberg (2005), had all differently confirmed that income is a factor that hinders effective domestic energy management within households. Similarly, Omar *et al* (2000), stated that as income level increases, people will switch from the use of solid fuels to cleaner fuels. They found out further that poor income generation of households is a prime hindrance to the management of domestic energy this is also in agreement with Alemika (2001) who stated that poverty as a social problem is multi-dimensional factor affecting all phases of domestic energy management within households.

Furthermore, Timmons (2005), noted that the geographical location of a household affects its domestic energy management. In agreement with the findings still, Dzioubinskiet *al.*, (1999), affirms that urbanization is an important determinant of both quantity, quality and the type of fuel used in households. They further noted that urbanization leads to highest levels of household energy consumption, although it is difficult to separate the effects of urbanization from the increase in income levels that generally accompany urbanization. The finding reveals that price of domestic energy is a hindrance to effective domestic energy management. This is in line with Straw (2008), who noted that price is one of the reasons for which a household could change the type of domestic energy used. He asserted further that when it comes to price, there is hardly brand loyalty especially for similar products. It can be deduced here that households change the type of energy used when the prices of the energy changes. This is in line with the findings of Sanda, Sambo and Mikailu (1991), who stated that respondents complained that gas and electricity are expensive (both the gadgets and bills). Therefore, they prefer to use fuel wood. They observed further that some added that gas and kerosene are highly risky and can set fire easily in the city settlements. In addition, they maintained that kerosene and gas should be made available at affordable prices by the government as these would to a great extent aid in correcting the environmental imbalances, as a result of excessive use of fuel wood. Also, in agreement with the statements Fuwape (2008), narrated that fuel wood is still the main source of energy in most parts of the cities and will continue to be relied on for a long time because it is cheap, available and renewable.

In a similar vein, Izekor and Osayinwen (2009), asserted that despite the introduction of modern forms of energy supply, the rising prices of alternative domestic energy sources have caused marked increase in the consumption of fuel wood especially in the tropics, which means that there is no brand loyalty as far as domestic energy is concerned and this affects its management negatively within urban and rural households. In addition, Hopkins (2006), stated that price disparity which occurs when different sellers offer different prices for the same goods in a given market is also a hindrance to the management of domestic energy. The findings of the study revealed that lack of awareness and lack of skill affects the management of domestic energy. This is in line with Heltberg (2005), who noted that lack of awareness and knowledge are important factor that hinders domestic energy management. The findings of the study are not in agreement with the observations of Troy and Randolph (2006), who stated that increasing the price of energy is acknowledged as one means of encouraging more careful use of energy.

However, they further noted that this is unlikely to be effective due to difficulties in persuading non-bill paying members of the household to reduce their consumption because the desire for comfort and convenience tends to override any motivation to be careful with energy consumption even if the price was increased. The study also revealed that habit formation is a factor that hinders domestic energy management. This is in agreement with the statement of Nnaji and Unachukwu (2010), that social habits and culture incorporates the mores and norms of the people for harmonious living. They further asserted that people need cultural re-orientation in energy use, if energy can be properly managed which means that habit and culture hinder the management of domestic energy.

In addition, Sreekanth, Jayaraj and Sudarsan (2011), opines that household size has important implication for domestic energy use because increase in household size means increase in domestic energy consumption and this will consequently make it difficult to be managed since many people are using the domestic energy at will. Similarly, in conformation with the above statements, Ramachandraet al (2012), states that the levels and forms of domestic energy consumed by the household sector depends on size of household and size of settlement and all these are hindrances to domestic energy management.

However, in the develop countries of the world the domestic energy mostly used are electricity and gas for all domestic activities. Even though, these domestic energies are used within the households, they also have factors which hinders its effective use. For instance, in these countries the high cost of these utilities has affected the usage because most households disconnect the electricity before leaving the home. Also, most of them find it difficult to heat their homes during winter and falls to avert high bills. Also, temperature can also have an effect on prices during the cooling season. For instance, US energy statistics (2016) stated that 33% of US electricity was generated with natural gas in 2015 and warmer than normal temperatures can increase the demand for air-conditioning, which also increases the power sectors demand for natural gas and can lead to increased in prices which most homes will find difficult to afford (US, Energy Statistics, 2016). This finding is also in support of Farsi et al., (2007), who narrated that money is one of the main factors that hinders households from using domestic energy as required.

However, the types of domestic energy used in developed countries such as Europe, US and Britain reduce environmental harmful emissions. This domestic energy is convenient because they have a well-established pipeline infrastructure in residential homes which delivers the gas to the homes. Although, they convenient also have their short fall which has handicapped many households for instance many buildings has been burnt down and may have .... as a result of this household pipe lines and careless of household members.

What this implies that, these type of domestic energies are equally necessary for the households in the developing countries including Abia State so as to reduce the environmental harmful emissions in the environment. The findings of this study deduced that whether developed, developing and underdeveloped countries a number of factors hinders the effective domestic energy management within households globally. The hindering factors may be technical availability, adequacy, reliability, convenience, safety, affordability among others. If these hindrances to effective domestic energy management practices are tackled very well, it will help to transform lives, economies and the planet. Moreso, this is in accordance with the Sustainable Development Goals. Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all (United Nations Generally Assembly, 2015).

The findings of the study revealed that there was no significant difference in the mean opinion responses of homemakers from large family size and small family size on all the 22 factors identified by the study as hindrances to effective domestic energy management. This implies that respondents accepted the factors as being responsible for poor energy management practices within urban and rural households. The ANOVA result recorded

calculated F-value of less than the table F-value of 3.13 at 0.05 level of significance at 2 and 347 degrees of freedom. This therefore, means that the null hypothesis of no significant difference is upheld in all the instances. So there is no significant difference in the mean rating responses as also shown in their overall ANOVA result.

### **Conclusion**

The following conclusions were drawn based on the findings of the study factors that affect domestic energy management practices, it is a vital issue for the family. Energy management is one of the tenets in energy sustainability so it is necessary to manage domestic energy well. There are many factors that hindered the domestic energy management practices like size of the family, money at hand, cost, lack of availability, educational status, stage of family cycle among others. These factors have been observed as key hindrances in domestic energy management practices globally. Also, if these factors are tackled properly by the homemakers it will enhance domestic energy management globally. In addition, creating awareness through seminars, conferences and workshops, reorientation of homemakers, sensitization among others will go a long way if properly executed to improve the factors that affect domestic energy management of the rural and urban households.

### **Recommendations**

The following recommendations were made based on the findings;

1. Government (Federal and Local Government) should make all the cleaner domestic energy available irrespective of social status.
2. Government should reduce the prices of the clean domestic energy for easy of affordability by all households.
3. Government should also pay salaries as at due to reduce the hardship suffered by households as a result of non-payment of salaries so as to enable them acquire domestic energy at well.
4. The professional home economist should educate the household members on the need to handle these factors that affect domestic energy through the students they teach.
5. Government should promulgate laws to arrest people that cause artificial scarcity, adulteration of domestic energy and inflation of prices and also implement these laws.

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