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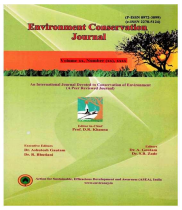

Role analysis of women in electricity consumption at domestic level

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ABSTRACT

Women play an especial prominent role in buying things that provide sustenance for home and family. Therefore, this study was under taken to see how women play their role with special reference to electricity consumption and what can be done to improve it. 'Awareness,' 'opinion' and 'practice' of respondents regarding issues related to electricity consumption for household use revealed that 'Awareness', 'Opinion' and 'Practices' of the respondents were of 'medium' level. Looking at the women's prominent role in household energy consumption they can be given some awareness programs to further play active role as consumer and conserve electricity.

Introduction

Electricity shortage is a burning problem, as it is; there is a gap between requirement and availability of power in our country. Household electricity use has risen to almost 50 times in the past forty years. As income levels increase, more people, will require modern fuels and appliances for a better quality of life. As the market is getting flooded with more and more white goods and the purchasing power of consumers escalating, the tug of war between demand and supply of power is aggravating and is shaking the national economy. Therefore, it commands due consideration to be directed towards conservation of power. It was reported that, the electricity consumption in the residential sector accounts for about one third of the total electricity consumption in the world (Nilsson *et al.,* 2017). On the other hand, it was found that, 'although, India's per capita residential electricity consumption which avail modern energy services such as cooling, clean cooking, lighting, and media access is less than a third of the world average (The Hindu, 2012). Studies revealed that per capita consumption of energy in India is one of the lowest in the world and comparatively consumption of electricity in household sector is much less then the advanced countries (Garg, 2012). India's industrial demand accounted for 35.0 per cent of electrical power requirement, domestic household use accounted for 28.0 per cent, agriculture 21.0 per cent, commercial 9.0 per cent, public lighting and other miscellaneous applications accounted for the rest. Comparatively, residential electricity now outpaces growth in industrial, commercial and agriculture sectors. The electrical energy demand for 2021–22 is expected to be at least 1915 TWh (Tera Watt hour), with a peak electric demand of 298 GW. Energy efficiency is a valid and highpriority resource in electricity generation. Planning of energy efficiency concept has been increasingly accepted in many OECD contexts (37 countries are its members). Among developing countries, energy efficiency concept elevated to a policy principle is still uncommon to find. Energy efficiency programs with institutional support can be highly beneficial (Blumstein *et al.,* 2005). The voluntary labelling programs are generally regarded as success (Singh *et al.,* 2000). Thus, as India currently suffers from a major shortage of electricity generation capacity, Anandan *et al.* (2013) the scenario is still not so affluent. Some researchers advocated that, adoption of more stringent standards for air conditioners and

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refrigerators, washing machines, including phasing out unregulated such type of bigger gadgets within a specific period would produce additional savings (Foran *et al.,* 2010). Living styles are not only improved with increased electricity consumption but due to inappropriate use also aggravated impacts on the environment (Zhang *et al.,*2017).

Most importantly, there is scarce publicly available data on the issue of electricity consumption; different studies predict dramatically different scenarios for the extent to which residential electricity use will grow. Proper data is required to prepare important policies in this respect and is thus a global concern. According to Zang *et al.* (2017) relevant energy policies are required to induce efficient electricity consumption in the residential sector in many countries due to global warming effects and security of energy supply.

Women play an especially prominent role in buying things that provide sustenance for home and family. In case of India, studies show that modern Indian women deliberate a dominant stand in household sector and are responsible for buying 80% of household goods (ToI, 2011). Different research asserted that women play key role in managing household consumption of electricity was opined by Shrestha *et al.* (2021). In spite of the scale of current and future residential electricity use, an understanding of household consumption patterns and their drivers is limited. Assessment of the awareness possessed, practices adopted and opinion of urban women regarding power consumption, conservation and selection, purchase and use of the 'white goods' is very important in today's context. Therefore, this study was under taken to see the above factors as to how women play their role with special reference to electrical gadgets and what can be done to improve it on whose action the power sector is somewhat dependent.

Material and Methods

The study made use of primary and secondary data. The secondary data in the form of articles, journals, news papers were used. For collection of primary data 100 homemakers residing in the Municipality area of Jorhat town, Assam, were selected by random sampling method to elicit information with the help of a well designed questionnaire. Analysis of data was done in terms of frequency and percentage. Apart from this the responses on 'Awareness', 'Opinion' and 'Practice' was recorded in terms of 3 point score ('always', 'sometimes', 'never' with corresponding scores of 3,2,1). The mean scores were calculated for each category of statements. These attained scores were ranked in terms of highest to lowest values. The sum of attained scores were divided by maximum attainable score to determine percent attained score was then classified as "poor", "low", "medium", and "high" by giving scores as < 40, 40- 60, 60 – 80 and 80- 100 respectively. On the other hand the relationship of a few socioeconomic variables, like age, education, employment, income on 'Awareness level', 'Opinion level' and 'Practice' level was tested along with electricity consumption per month using correlation test.

Results and Discussion

Socio economic status: The data was analyzed and graphically represented in Fig.1. It was revealed that 80% of the respondents were between 30 to 40 years of age, Majority of the respondents (58%) were graduates and 20 % were post graduates which asserted that majority of the women were young and educated and could play a responsible role as electricity consumer. Majority (59%) of them were unemployed while 33% were employed. Fifty percent had monthly income between Rs. 25000 – 50000 and 28% earned more than Rs. 50000. Thus, it showed that majority of the respondents were in the category of lower middle income group and to see their role as electricity consumer will be valuable information in the present study.

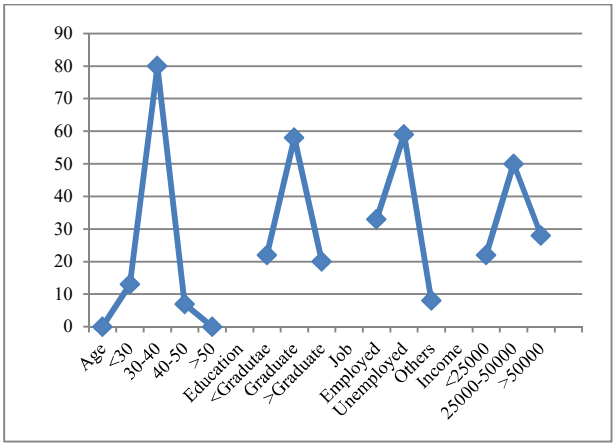

Figure 1: Demographic information of the respondents

At present, compared to old days everybody has become electricity hog having almost every things run on electricity. In the household sector, it was found that small appliances continue sucking up greater amount of wattage in the urban areas. Small appliances were lumped in one statistical category called "miscellaneous" and now miscellaneous energy is one of the largest and fastest growing categories of energy use. In this connection data on gadgets purchased in last five years was assessed, it was observed that more number of respondents purchased inverter, mixer grinder, refrigerators compared to other gadget during last five years (Figure 1). That means with the availability of myriad attractive products in the market and instalments and offers provided by companies helped people to purchase these gadgets for domestic purpose has increased over the last few years. However, very common gadgets constantly used by people with higher purchasing power such as dishwashers, microwave, washing machines, vacuum cleaners etc. were not found among the respondents of this income group. It was revealed that, the average year wise power shortage in fact ranges between 11 – 15 percent since 1999 which is the predominant power scenario in our country (The Hindu, 2012). On the other hand intermittent power cuts prevailing throughout the day was another reason that reflected its inadequacy. As part of the process of economic liberalization, in India, State Governments are slowly moving towards corporatisation, privatization and commercialization of electricity generation, transmission and distribution to combat inadequacy and to earn more revenue. That will lead to power generation and supply to operate on commercial principles, slowly reducing or withdrawing the subsidy on power charges. This would mean higher power tariff and consequently, a higher power bill. On the other hand, more energy generation will lead to degradation of environment, unless non-conventional energy sources are adequately exploited. Thus, these factors are important from environmental point of view, as it has negative effect on the environment; conservation of energy helps to conserve our ecosystem.

Table 1: 'Awareness' of respondents regarding issues related to electricity consumption for household use

SN	Statement	Total score	Mean score	Rank
1.	Energy star labeling is very important criteria for selection of gadgets	194	1.94	XI
2.	More stars means efficient and consumes less power	193	1.93	XII
3.	Warranty and guarantee cards are security for the term period	250	2.50	IV
4.	Cheaper gadgets consumes more power and may be less durable	253	2.53	III
5.	Purchase from reputed dealers ensures quality and service	201	2.01	X
6	LED bulbs are good over others because it consumes less energy	203	2.03	IX
7	Standard logo like ISI (domestic) and ISO (imported) ensures quality	259	2.59	II
8	Products in reduction sales are not good	237	2.37	VII
9	Power bill increases with increased use of gadgets.	261	2.61	I
10	Poor Wiring consumes more power	240	2.40	V
11	Inverters are used for uninterrupted electricity supply and is common in every household	239	2.39	VI
12	Use of Inverters is an additional load for the household	206	2.06	VIII
Total mean score			27.36	

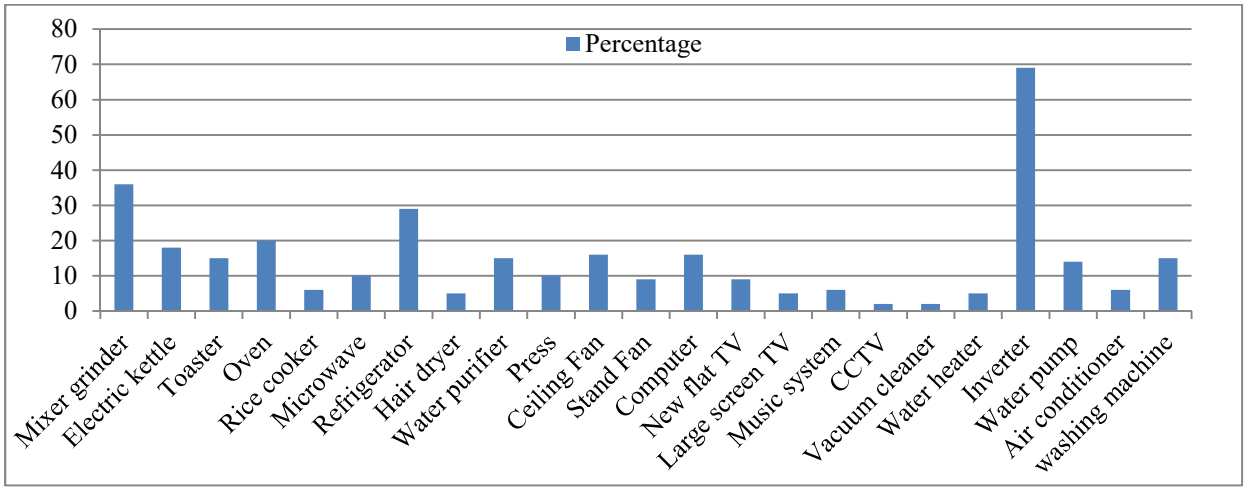

Figure 2: In last five years new gadgets that were purchased by the respondents N=100)

In the above milieu awareness of women on electricity use was studied (Table 1) and results depicted that awareness of respondents about increase of power bill due to increased use of electrical gadgets (Rank I) and that Standard logo like ISI and ISO seen in gadgets ensures quality (Rank II). Cheaper gadgets consume more power and may be less durable (Rank III). To them warranty and guarantee cards were security for the given term period and should be kept properly. Inverters are a common gadget found in majority of the households (Figure 1) which was an additional load and implies that the disruption of electricity supply was quite high. Their awareness on use of standardized products, use of efficient LED bulbs, merits of energy efficient labelling, proper household wiring scored lower ranks. The maximum attainable score of this category was 36, the attained score was 27.36 (Table 1) and per cent attained score by all the respondents was recorded as 76 per cent depicted in Figure 3.

Assessment of data on 'Opinion' of the respondents with regard to purchase of Electrical Gadgets revealed that 'gadgets life and performance were affected by intermittent power cuts' (Rank I). Before purchasing 'knowing about after sell service available locally is very important' (Rank II). 'Sellers been not always reliable and tries to motivate buyers to buy a gadget in terms of profit they earned' (Rank III). And that, 'many advertisements in different Media were confusing, misleading and exaggerating' was (Rank IV). While opinions on 'right decision in purchase and use of right gadget greatly affects the energy bill', and 'proper sell talks from the company helps in good decision' obtained lower ranks. The 'labels and instruction manuals with the gadgets give enough information on use and care' obtained lowest rank. Thus, it can be said that proper informative advertisements and seller's friendly and selfless role might help consumers and they in turn should consider to read the instruction manuals and labels properly which otherwise might lead to waste of money and energy. The maximum attainable score of this category was 36, the attained score was 26.83 (Table 2) and per cent attained score by all the respondents was found to be 74.53 percent Figure 3.

With regard to the above context analysis of data in Table 3 regarding practices followed by the respondents in use of electrical gadgets, it was revealed that 'putting off lights and fans immediately when not in use' was strictly followed (Rank I). While purchasing gadgets, 'brand names', 'design/colour/model', 'cost of gadgets', 'instalment facilities', 'gift items' helped in making decision and were ranked II, III, IV, V,VII respectively. While to them 'online shopping' was not preferred way for purchasing electrical gadgets, on the other hand, 'preference for spending higher price to buy gadgets that consumes less energy', 'reading labels before buying', 'choosing in terms of capacity and requirement' ranked lowest. The maximum attainable score of this category was 42, the attained score was 31.42 (Table 3) and per cent attained score of all the respondents was found to be 72.93 per cent indicating 'medium' level of practices followed. Percent attained scores of the

Table 2: 'Opinion' of the respondents with regard to purchase of Electrical Gadgets (N=100)

SN	Statement	Total score	Mean score	Rank
1	Gadgets are bought to simplify work	236	2.36	VI
2	Possessing Gadgets enhance family status	237	2.37	VII
3	Knowing about after sell service available locally is very important to take decision	253	2.53	II
4	Seller's description of the product is worthy to be considered	195	1.95	X
5	Warranty and guarantee cards are always not helpful in getting proper service.	209	2.09	VIII
6	Intermittent power cuts effects gadgets life and performance	260	2.60	I
7	Labels and Leaflets given with the gadget gives proper information on use and care to get better service	174	1.74	XII
8	Warranty/guarantee are to be considered in taking decision	242	2.42	V
9	Seller's motivates buyers to buy a gadget in terms of profit they earn.	250	2.50	III
10	Sale talks can change the buying habits	204	2.04	IX
11	Many advertisements are confusing, misleading and exaggerating.	248	2.48	IV
12	If right decision is not taken in purchase and use of right gadget it greatly effects the energy bill	1.75	1.75	XI
Total Mean Score			26.83	

Table 3: 'Practices' adopted by respondents with regard to electrical gadgets

SN	Statement	Total Score	Mean Score	Rank
1.	My children put off lights and fans immediately when not in use	242	2.42	VI
2.	Gift items given with products motivates me to buy	240	2.40	VII
3	Advertisements in different medias motivates me to buy a particular gadget	194	1.94	IX
4	Design/colour/model of gadgets influences me to take decision	257	2.57	III
5	I read labels before purchase	1.86	1.86	XI
6	Brand name helps me to take decision	262	2.62	II
7	My choice for a particular gadgets is considered	168	1.68	XIII
8	I prefer to spend some more money to buy a gadgets that consumes less energy	170	1.70	XII
9	I consider cost and make decision	255	2.55	IV
10	I don't have choice with regard to type of bulb for using at home	218	2.18	VIII
11	I put off lights and fans immediately when not in use	265	2.65	I
12	Installment facilities helped me to buy gadgets	251	2.51	V
13	Online shopping is better than direct shopping in case of electrical gadget	165	1.65	XIV
14	While buying I see capacity and size of the gadget to take decision	190	1.90	X
Total Mean Score			30.63	

Table 4: Relationship between few socio economic variables and personal responses on electricity consumption.

'r' Value	Education	Income	Age	Employment
Awareness	0.649	0.302	0.246	0.033
Opinion	0.537	0.249	0.095	0.024
Practice	0.544	0.414	0.501	0.018
Monthly electricity bill	0.413	0.692	0.024	0.650

responses of these educated respondents revealed that both 'Awareness', 'Opinion' and 'Practices' of the respondents with regard to electricity consumption were of 'medium' level represented in Fig. 3. Rising female consumer power, emerging as a potent force in the marketplace, had led companies to change the way they design, make and market products.

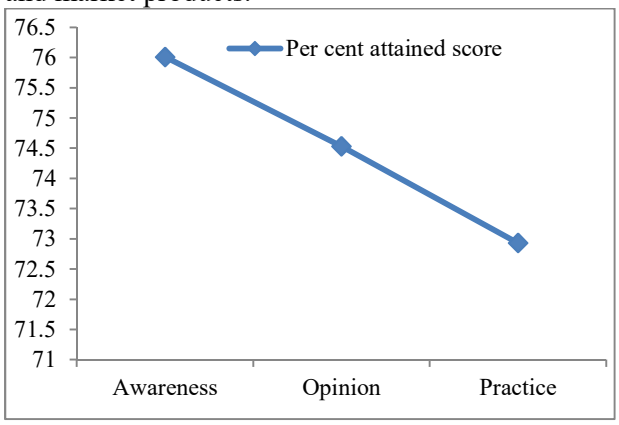

Figure 3: Percent attained scores of the respondents 'awareness', 'opinion' and 'practice'

Although, it is often played down, but, is clear that women have a great deal of influence in the economy as consumers. In other words, spending power, of women can play vital role in controlling household power consumption by selecting, purchasing, conserving and using better electrical products along with other consumable goods. In this context relationship between a few socio economic variable of the respondents and their response level in electricity consumption pattern was tested through correlation coefficient. It was found that (Table 4) 'education' had highly significant positive relationship with 'awareness', 'opinion' and 'practice' levels of the respondents. There was positive relationship between 'income' and 'awareness', 'opinion' and 'practice' levels of the respondents, on the other hand there was no relation between 'age' and 'opinion' but 'age' had positive relation with 'practice'. With regard to relationship with electricity consumption 'income' had highly significant relationship where as 'age' had no relationship. With regard to type of employment there was no relation with 'awareness', 'opinion' and 'practice' levels of women but had shown positive relationship with monthly electricity bill. Dar-Mousa et.al, 2019, in a study found that there was obvious correlation between the size of the household and the amount of energy consumption in Amman City, Jordan. In another study by Wijaya, 2013, conducted in Bandung, Indonesia, family size, time spent at home, education level, home appliances and lighting had a significant, positive effect on the monthly electricity bill. Thus it can be said that different factors play multiple roles in electricity consumption in domestic level but women can play responsibly if adequate steps are taken to improve this scenario.

Conclusion

This study revealed that the educated urban women had medium level of 'awareness', 'opinion' and 'practice' pattern. These aspects might be still lower among lesser educated women and in rural areas as shown in the correlation test that education level of respondents showed highly positive relationship with 'awareness', 'opinion' and 'practice' levels and monthly electricity bill showed higher positive relationship with 'income' and 'employment' compared to that of 'education'. It has been understood that, restrictions on use of electrical gadgets cannot be imposed; as possession of these utility goods is one of the prime factors which contribute a lot in up gradation of economy as well as shaping life style and social standards of living of the family. However, indiscriminate purchase of these goods will hamper the economy of the household in particular and the nation in general. Therefore adequate drive for creating awareness among women about issues related to electricity consumption at home is very important. Some steps such as prohibiting supply and manufacturing of non branded gadgets from entering markets, providing reliable information on electrical goods and services to the consumers by sellers, encouragement for renovation of old household wiring with subsidy and with quality products, mandatory energy labelling, reduction of price difference between energy efficient products and others, providing proper labelling, subsidy to companies producing energy efficient products can help in energy savings. Apart from this proper knowledge should be endowed through catchy awareness campaigns in audio visual Medias through attractive presentations to encourage women to practice good buy man ship. It is important to undertake such determining strategies

in a mass scale. Constructive steps will greatly help in reducing per unit consumption of electricity by preventing waste and exploitation in household sector which consumes great amount of energy and would thus help further in improving power scenario of the country. Based on these results, an energy conservation policy may not be generalisable but will have to be specified based on local characteristics to ensure that the policy is broadly adopted by society.

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