

AWARENESS, ADOPTION AND IMPACT OF ELECTRICAL ENERGY APPLIANCES: A HOUSEHOLD LEVEL STUDY

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SUMMARY

This study is sponsored by Kerala Research Programme on Local Level Development and addresses the problem of awareness, adoption and impact of electrical energy appliances at the household level. This study has been carried out in three panchayats of Thiruvananthapuram district viz. Ulloor, Chirayinkeezhu and Vithura which are situated in varying environs of urban, suburban and rural, respectively.

The primary data required for the survey have been collected employing a questionnaire based random surveys in about one hundred households in each panchayat. The questionnaire required for the survey has been formulated in a detailed and comprehensive manner. The questionnaire first formulated has been refined based on a pilot survey. The data collected and analyzed to bring out the salient feature of the study. Further, stratification studies have been carried out by grouping the households suitably depending as the type of electrical appliances possessed by the households.

The general socio-economic features of the households in the panchayats surveyed form the backdrop of this study. the nature of the family whether it is nuclear or joint, has also been considered in formulating some of the results. The educational background of the members of the households which have been surveyed has also been addressed to. Since NRIs in the areas of study play an important role in the possession of electrical energy appliances (some of them are imported), the role played by them is also looked into. Also studied was the non-electrical sources of energy.

The various electrical appliances possessed by the households have been considered in detail. It has been found that a comparatively new entrant like Compact Fluorescent Lamp has found wide acceptance. This is an indication that people are conscious of useful innovations and they respond positively towards them. The varied uses of electrical appliances for lighting, cooking, entertainment, etc have also been looked into.

The use of electrical appliances presupposes the awareness about them which along with utility and requirement prompts in the possession of them. Hence, awareness about the household electrical appliances was a topic that was investigated in the study. Attempts were made to find out the source of information about the appliances. Once people become aware of a particular appliance and possess it, then it is a matter of adopting to them. The relative influences of various factors which go into the process of this adoption have been studied. The necessity of procuring the appliance and also the question of affordability were looked into. The role of women in the decision making process, which leads to the possession of these electrical appliances, has also been investigated.

The study also aimed at finding out the impacts of electrical energy appliances on the life style and other aspects to the members of the households. The impacts are multifaceted. It is seen that one of the important impacts has been the availability of more leisure time. This has facilitated in some household atlas, taking up part time jobs like cottage industries. This shows that adoption of electrical appliances helps in generating more income, thus enriching human resources. The majority of the respondents agree that by virtue of adopting these electrical appliances, there is saving of time and labor and added to these are comfort and convenience. The study also includes the gender based aspects of adoption and impact of electrical appliances.

CHAPTER I

INTRODUCTION

It can be said without doubt that, of all the technological developments so far made, electrification has had the maximum capacity to affect so fundamentally the way people live, work, entertain and communicate. This is equally true of the household sector as for other sectors. This study sponsored by Kerala Research Programme on Local Level Development deals with awareness, adoption and impact of various electrical appliances used in day to day life. The study is aimed at fathoming the changes brought about in the life styles of people by the use of household electrical appliances through micro level study at household level.

The advent of electrical appliances commences first as invention, then as innovation and thirdly as diffusion through commercialization. It can generally be said that the process of introduction of a product commercially can be divided into three parts: 1) invention - devising a new model or process. 2) Innovation - actually introducing the invention to the market for the first time. 3) Diffusion - subsequent production and consumption of the inventor through economy¹. It may be mentioned that Alfred Noble Whitehead has observed that the greatest invention of 19th century was the invention of the method of invention itself.

It is seen² that many intermediate steps must be completed before commercialization of innovations. In many cases, ancillary inventions or improvements, frequently from other technologies, are needed; new products must be redesigned for greater convenience and cost reducing changes are necessary as consumers discover new unanticipated uses.

Introduction of major electrical appliances in the household use has not been that gradual, but in the present days, the duration of lag between lab research and their commercial utilization is narrowing down. Some of the major electrical appliances introduced in the post war era in US are given below: ³

1950s

Refrigerator freezer

Television

Automatic Washing Machine

1960s

Colour Television

Frost-free refrigerator-freezer

1970s

Microwave Oven

Food processor

1980s

Home Computer

Large screen television

Home satellite receiver

The estimated time lags between invention and innovation of some gadgets are as following:

<u>Invention</u>	<u>Interval</u> (Years)
Fluorescent lamp	79
Television	22

Radio (oscillator)	8
Freon refrigerator	1
Magnetic recording	5

This study was aimed to find out the awareness, adoption and impact of electrical energy appliances on selected households in three panchayats namely,

1. Ulloor- This panchayat forms a part of city agglomerate. Hence this panchayat could have acquired urban life style.
2. Chirayinkeezhu- This can be classified as a suburban panchayat. It is also generally known that comparatively large number of people have gone abroad from this panchayat.
3. Vithura- This panchayat is located in a highland area having a rural set up.

Objectives

1. To find out the ways and means by which people acquire information about the various household electrical gadgets and their uses.
2. The impacts on life style brought about by adopting these electrical gadgets.
3. To explore as far as possible how members now allocate their time between different activities. In particular, we will focus on the women members and what they do in the spare time now made available.

References

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3. Opcit p.108
4. Edwin Mansfield. The economics of technological change. Longman 1968 p. 107

CHAPTER II

METHODOLOGY

This study involves the collection of household level information, which was carried out employing a suitably designed questionnaire. The questionnaire has been rather exhaustive and attempts were made to make it comprehensive so that, these required primary data can be collected using them. The researcher approached the selected households and data were elicited from the people of the households by utilizing the questionnaire. The technique of random sampling of households was employed as far as possible.

Earlier, a pilot survey was carried out on the basis of a formulated questionnaire. This led to the refinement of the questionnaire of the survey. Subsequently, the final formulation of the questionnaire was made and this was then used for the survey in the selected panchayats. For the purpose of the analysis of data, the households were stratified into three groups, depending on the use of nature of electrical appliances. They are the following:

1. Under group A comes the households, which use only more common electrical appliances like electric bulbs, tubes etc.
2. Group B consists of households, which use, apart from those in group A, such appliances like radio, TV, audio player etc.

3. The category C consists of households which utilize, apart from the appliances in group A & B, more expensive electrical appliance such as colour TV, washing machine, refrigerator, computer etc.

This groupings of households into Groups A, B, & C were used for stratification studies. The data thus collected were subjected to proper analysis and various relationships worked out. Based on such analysis of data, information was obtained which enabled in meeting the requirements of the study.

CHAPTER III

OVERVIEW

Attempts to power equipment with electricity appears to be spontaneous. This is true of domestic appliances also. The ease to use which electricity offers seems to be the indisputable reason for this.

This study covers three panchayats in Thiruvananthapuram district for which the electricity consumption in domestic sector is about 57.44% of the total consumption for various sectors, which shows an average annual growth rate of 21.11%¹. This can be compared with the domestic power consumption in Kerala which for the period 90-91 was 1637.74 Mkw and this is estimated to be 5044.78 Mkw in 2001-2². Going further to the scenario in India, the residential energy consumption for 1991-92 was 13.10 MTOE (10.02% of the total consumption) This has been 17.21 MTOE for 97-98 while the percentage of the share fell to 9.77%. For the residential energy consumption for 97-98, the share of electricity was 4.14MTOE³. It cannot be assumed totally that residential energy consumption is on the decrease, generally. However, for Thiruvananthapuram, it is seen that domestic electric consumption is showing an increasing trend and it may continue to be so. Here it might be worth mentioning that in a study conducted in Indian village of Pura electricity provided only 1% of the total energy needs ⁴.

For the sake of comparison, let us consider the case of US. In US, initially, household use of electric power was devoted primarily to lighting. Average residential electricity costs for US

household declined from 7.45 cents per kilowatt-hour in 1920 to 6.03 cents per kilowatt-hour in 1930, and the residential use of electricity increased more than three fold in response during this period⁵.

It is to be noted that introduction of electrical appliances in households, met with little or no objection from the consuming society. This is not the general case with other innovations. For example, let us consider the following cases: When automatic telephone exchange was introduced following the adoption and diffusion of telephones, there was objection that telephone operators would be redundant and be out of job. But, subsequent developments proved them wrong as more and more people came to be employed in telephone related activities. Another case is when rails were laid for the running of trains in England, a section of people objected to it saying that rails were a hindrance to the smooth passage of horse riders. Thirdly telegraphic wires in some areas of Japan was a case for riots which were caused by the ignorance and suspicion in some sector of the public⁵. They connected the new contraption with the new conscription laws called 'blood tax', and thought were going to be used to transmit the extracted blood of their children to dye red blankets in Tokyo.

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CHAPTER IV

GENERAL BACKGROUND

All the three panchayats under study viz. Ulloor, Chirayinkeezhu and Vithura are situated in Thiruvananthapuram district of Kerala.

Attempts were made to survey 88 households in Ulloor, 90 in Chirayinkeezhu and 93 in Vithura. An analysis of types of houses shows that the maximum number of houses are concrete type followed by tiled and thatched. The asbestos houses have a low score; obviously they are not the preferred ones.

The number of rooms per household when analyzed is more for concrete and lowest for thatched. The details are as shown in Table 1. Among the panchayats, Table 2 shows the distribution of houses by types and ownership. It can be seen that the overall picture is that 92.6% of all types of households in these panchayats is owned by the people residing in them. The maximum percentage of owned houses is in Chirayinkeezhu, and for the other panchayats the percentages are almost the same.

The distribution of houses by size class of area of land possessed is detailed in Table 3. There are persons with no land holding for which the total percentage of all the three panchayats is 12%. The figure is rather misleading since the figure for both Ulloor and Chirayinkeezhu is 1.1% only. Vithura seems to be a place with more number of persons with no land. Also the number of households with maximum land holding is also in Vithura, which is 12%. The average landholding is rather high in Chirayinkeezhu which 29.98 cent. Another study of the distribution of houses by type of family (whether nuclear or joint) and average land holding size shows that joint families hold more land, which is not surprising. Table 4 shows the distribution of houses by type of family and average of the household size. It is seen that the nuclear families are maximum in number in all the three panchayats. The educational background scenario is detailed in Table 5. The maximum number of people with higher education are degree holders and the number of people with postgraduate degree is also not less. The status of education can generally thought to be a reflection of the scene in Kerala.

Attempts were made to find out the sources of income for the residents of these panchayats. Services seen to be the major source of income. Some people have reported that they

have multiple sources of income as shown in Table 6.

The analysis of distribution of houses by type of house and electrification in Table 7 shows that the maximum number of houses electrified is of concrete type for all the three panchayats and this is understandable. The difference between the number of concrete and tiled houses electrified is sharp and this difference is less in Vithura. The number of houses electrified is also less in Vithura and the total percentage of number of houses electrified is 95%, indicating still more can be done in the case of electrification, especially, in the case of the weaker section and the rural areas.

The domestic electric supply is with single or three phase. The three-phase connection implies the increased use of electrical appliances and also more number of electrical appliances. An analysis of distribution of houses by the type of house and nature of electric connection has been carried out, and is as shown in Table 8. As expected, the three-phase supply is more for concrete houses and is maximum for households in Chirayinkeezhu. It is noteworthy that a few tiled houses also use three phase connections. However, there is no three phase connection in the asbestos or thatched houses which have been surveyed, in all the three panchayats.

People use both locally purchased electrical appliances as well as imported ones. This is significant in panchayats under study especially in Chirayinkeezhu, where, out of the 90 households in which survey was conducted, 58 have NRI members. This panchayat also has more number of electrical appliances as shown in Table 9. Totally, in all the houses the Chirayinkeezhu, 448 imported electrical appliances of varying kind are in use. The per capita availability of electrical appliances, as expected, is maximum for Chirayinkeezhu (7.59), Ulloor (6.09) comes next and lastly Vithura (5.81).

An analysis of distribution of houses by type of family (whether nuclear or joint) and status of electrification yields interesting results. Significantly, more number of nuclear families have electric connection compared to joint families as shown in Table 10. The electrification is 77.3% for nuclear families in Ulloor, 92.2% for Chirayinkeezhu and 74.2% in Vithura.

In total, 85% of the households with electrical connections are nuclear and the rest 14% joint families. This leads to some interesting economic implications like that nuclear families seem to be better off compared to joint families, assuming that electrification is a matter of affordability. Also, it is interesting to note from Table 11 that more number of people living abroad are from nuclear families. This figure is 11.36% (of the total number of households) for Ulloor and 56.6% for

Chirayinkeezhu and for Vithura, it is 16.12%. The intervals between visits by NRI to native place were also studied. This is shown in Table 12. In most of the cases, the visit to native place by NRI is once a year. This is followed by once in two years. In extreme cases or more than once a year (10.71%) and once in more than three years (3.57%) have also been noticed.

A study of the distribution of houses by size class of monthly electricity bill was carried out. This is as in Table 13. It can be seen that in the case majority of households in these panchayats, the electricity bill is between Rs.101-200 per month. Only in the cases of Chirayinkeezhu, there is an equal number of households paying higher tariffs of Rs.201-300. In toto, the average electricity bill comes to Rs.176. This amount is more than the maximum number of households paying an average amount of Rs.155/-. The distribution of houses by the type of electric supply and average electric bill was also looked into as shown in Table 14. As noted earlier, maximum number of households have single phase and they pay an average monthly electricity bill of Rs.160/-. The maximum number of three phases is in Chirayinkeezhu and they pay an average amount of Rs 207. It is generally seen in all these panchayats, that the households with three phase connections pay more amount as electricity bill, and this is about 1.5 times the average payment for single phase connections.

An effort was made to find out the use of non-electrical sources of energy at the households surveyed. This is brought out in Table 15. It is seen, generally, that people prefer to use a combination of electrical and non-electrical sources of energy. The biogas plants are used minimally. The corresponding figure is 3.4% for Ulloor, 1.1 % for Chirayinkeezhu, and 2.2% for Vithura. Understandably, wind mills are not in existence in any of the household since the usual practice for electricity generation is to have windmill farms over large areas. Improved choolas are also used though not widely. The solar cooker is yet to be used in the surveyed houses. LPG stoves are widely used in all these panchayats, irrespective of whether it is in city or rural environs. It is seen that, generally, the penetration of non-conventional energy source can be more effectively carried out in the panchayats studied. This can be compared with the all Kerala statistics, which gives a target of 1500 biogas plants and an achievement of 765 for the year 1978. In the case of improved choolas these figures while the target 1,00,000 and achievement 24,748.

CHAPTER V

ELECTRICAL ENERGY APPLIANCES

The households surveyed use various kinds of electrical appliances. The wattage of some of the household electrical appliances commonly used are given below¹:

<u>Appliance</u>	<u>Watts</u>
Radio single circuit	30
Refrigerator	100-160
Television set	150
Washing machine without electric heater	300

This study attempted to find out the extent of various electrical appliances in use in the panchayats surveyed and the result are as given in Table 16. This table gives the number of households possessing particular appliances and their average number. As mentioned earlier the average number of rooms per household is five and, the number of tubes used seems to agree with the average figure of 3.32. The number of bulbs is more may be because of electrical lighting outside the rooms, perhaps around the house premises. It is seen that a good number of emergency lamps are also in use, an average of one per household. There is at least one radio in every household and this figure is slightly high in Vithura. In these days, it is to be noted that radios also serve their purposes. It is noteworthy that the colour TVs are more prominent than B&W TVs in all the panchayats. The electric pumps also have made their presence felt in the panchayats and are more in Chirayinkeezhu. The household use of refrigerator is more than the washing machines. The computers have also started entering the life. This study shows that Chirayinkeezhu has more number of computers compared to other two panchayats.

It is worth mentioning that this study shows that a comparatively recent entrant like CFL has found wide use. That indicates that the people are conscious of useful innovation and they respond positively towards them.

The appliances discussed above are used for various purposes like lighting, cooking, entertainment etc. As these appliances are powered by electricity, various purposes for which electricity is used in these panchayats were also studied. This is shown in Table 17. This table gives the number of households which use electricity for a particular purpose and also its

percentage taken for total number of households surveyed, including non-electrified households surveyed. Thus, for Chirayinkeezhu, all the houses surveyed are electrified and the use of electricity for lighting is cent percent. It can safely be assumed that in all the households which are electrified, electricity is used for lighting purposes. The use of electrical appliances for entertainment ranks second followed by kitchen equipment. The use of electrical appliances for cooking is minimal. Hence, there is enough scope for penetration of electrical gadgets like cooking range in households.

Some studies based on stratification were also carried out. The households were stratified as per the groups of electrical appliances. Under classification A are the households that use appliances like tube light, bulbs, torches, emergency lamp, calculator, CFL, radio, audio player and B&W TV. Under classification B comes appliances like colour TV, video player and mixie, in addition to appliances included in category A. The category C comprises households possessing appliances listed in category B. Additionally, they possess any other appliances like computer, electric pump, washing machines and refrigerator. Some interesting results emerges based on these groupings. The distribution of households on the basis of these groups and the nature of these houses are as given in Table 18. The maximum number of concrete buildings are in group B in Ulloor, while in the other two panchayats they are in C. Only in Vithura, a couple of asbestos houses come in Group C and none of the thatched households are in Group C. Also, both in Chirayinkeezhu and Vithura Type C households are more in number than type B.

Table 19 gives the distribution of houses that use electrical energy appliances and their average bill, based on this grouping. The average electricity bill for groups B&C are almost the same for Ulloor and markedly different for the other two panchayats. In accordance with other similar findings, Chirayinkeezhu has a more number of households in the higher category. The bills for Group A are less indicating less consumption of electricity compared to Groups B&C.

A study of electrical appliances used in the households and their nature of electric connection (single/three phase) is detailed in Table 20. The households coming under category A have no three-phase connection. Understandably, Group C has more number of households with three-phase connection which are costlier than single-phase connection. An intercomparison between Tables 8 & 20 shows that almost all three phase connections are in concrete structure.

As discussed earlier panchayats have members who are NRIs. Hence, attempts were made to find out the number of electrical appliances that are imported and which are used by them.

This is shown in Table 9. This analysis has yielded interesting results. It is seen that the percapita (NRIs only) of imported appliances in the houses is almost the same in these panchayats, though there is appreciable variation in the number of people who have gone abroad. This conclusion is based on the assumption that the imported appliances were brought to their house by NRIs and not purchased in India.

Reference

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CHAPTER VI

AWARENESS AND ADOPTION OF ELECTRICAL ENERGY APPLIANCES

The use of electrical appliances presupposes the awareness about them which along with utility and requirement prompts their possession. Hence, awareness about the household electrical appliances was a topic that was investigated in this study. Attempts were made to find out the sources of information about the appliances. For this purposes, sources like print and electronic media and personal contacts were examined. This is brought out in Table 21. A combination of these various sources seems to be the prompting factors. For Ulloor, the maximum awareness comes from Newspapers /magazines and TV. This is followed by a combination of these two, together with personal communication and contacts from friends and relatives. For Chirayinkeezhu, radio also plays an important role. The ratings almost the same with and without the influence of friends and relatives. This is markedly different for Vithura, where the influence of friends and relatives seem to play a prominent role. In general, it is seen that all these factors contribute towards the acquiring awareness about the household appliances (Table22). In Chirayinkeezhu and Vithura, these figures do not vary much and is about 65%. Overall, taking all three panchayats 67.8% of the household members have disseminated information to others. It is worthwhile to note that the target group of informants themselves act as secondary informers in many a case.

The survey also attempted to find out whether the people procured electrical appliances on the basis of felt necessity or just for the possession of certain luxury items. This is brought out in Table 23. It is interesting to note that without exception, all the households have procured the electrical appliances out of necessity in all the three panchayats. This indicates the overwhelming penetration of electrical appliances in the day-to-day life of people irrespective of any other factors.

Once people become aware of a particular electrical appliance and its use, they procure it, then it is a matter of adopting them. There are many factors which go into the process of adoption. The various factors that influence adoption like knowledge about the equipment, prior familiarity with their operation, necessary income to procure and maintain them and a combination of these factors. The relative influences of these factors emerging out of this study is reflected in Table 24. The analysis shows that prior knowledge about the appliance seems to be a factor of overriding

importance in all the panchayats. For Chirayinkeezhu, prior familiarity with their operation also scores a relatively high percentage. This panchayat also shows that higher income is prime reason which facilitates adoption of these appliances. Judging from human psycho, the possession of such gadgets brings in a feeling of pride in most of the people.

Some of the electrical appliances are used by men only, some by women and some by both. This gender difference in the adoption of electrical appliances has been studied and is brought out in Table 25. The electrical appliances are used by men only in Chirayinkeezhu (100%). In Vithura, it is slightly higher (10.7%). It is seen that most of the appliances are used by woman only as their percentage is almost the same in the three panchayats. The percentages of appliances used by both men and women do not vary appreciably among the panchayats. The children also play a part in their uses though not much. This results are so because most of the family chores are done by women and they seem to take more interest to find in leisure time activities. Thus, it is observed that women find more use of these electrical appliances.

Earlier in Table 23, it was seen that almost every household procured electrical some appliances out of necessity. Now it can be examined whether they are affordable. This has shown that people adopt them even when they are not affordable. Table 26 indicates the procurement of electrical appliances on the basis of affordability. Of the three panchayats, Ulloor scores the maximum with regard to affordability among the households showing 95.5%. Chirayinkeezhu comes second and Vithura third. A comparison of Table 22&25 shows that people go for procuring the electrical appliances mainly for reasons of their usefulness even if they cannot afford.

Before adoption comes procurement which succeeds the decision making process. Hence, various aspects of decision-making process were studied. These factors emerge from Table 27. Two main factors which are to be considered as the basis on which decision is taken are availability of finance and immediate requirement. While immediate requirement seems to be a factor in Ulloor panchayat, the availability of finance seems to be the factor which plays a role in the other two panchayats. A combination of these two understandably is the major influencing factor in all the panchayats. It appears that there is hardly any other factor which influences the decision making process. Considering all the panchayats, both availability of finance and immediate requirement influence about 52% of the handholds in this decision making process. It is to be noted that in the urban panchayat of Ulloor, immediate requirement may be due to more number of women being employed.

The role of women in decision-making process has been looked into with regard to the procurement of electrical appliances. This is given in Table 28. In majority of cases, decisions are taken collectively by both men and women. Most of the decisions are taken through discussions among the family members. Perhaps, this aspect of decision-making process can be extended to other areas in the family which result in establishing harmony among family members.

CHAPTER VII

IMPACTS OF ELECTRICAL APPLIANCES

The changes in lifestyle after the adoption of these electrical appliances was looked into. This results are as per Table 29. One of the major impacts seems to be the availability of leisure time which is made use of for other activities in Ulloor and Chirayinkeezhu panchayats. But in Vithura, this aspect is scored by increase in electricity consumption. This may lead to the conclusion that in Vithura, unlike in other two panchayats, electrical appliances purchased are just sufficient to meet their needs and they are not left with any spare time because of procuring the electrical appliances. One of the important impacts appears to be awareness created about the availability and usefulness of these appliances. Both in Ulloor and Chirayinkeezhu, this appears to be important. The special case of food items was looked into, and this is prominent only in Chirayinkeezhu.

An apparent aspect is the increase in electricity consumption. None of the household has reported saving in money as an impact of possessing electrical appliances. It has already been observed that one of the impacts of electrical appliances is the availability of more leisure time. It has been attempted to look into this aspect in some detail in (Table 30). One important result is that acquiring of electrical appliances has facilitated engaging in part time jobs like cottage industries in varying degrees in all the panchayats. This leads to worthwhile use of human resources besides improving the local economy. Leisure time also provides improving and increasing the readership and therefore of widening the knowledge base. This is besides the knowledge being gained from the use of T.V, radio, etc. This element has a high score in all the three panchayats. The findings also indicate that because of acquiring electrical appliances, people are able to give more attention to children's education. Thus, it is seen that there are many positive impacts borne out of usage of electrical appliances.

The impact of acquiring electrical appliances on the household expenditure is also looked into. The results are listed in Table 31. It is apparent from the table that, as a result of the appliances, the expenditure has not decreased but increased; the highest increased was observed in Vithura. When one compares with the Table 29, it can be seen that the increased consumption of electrical energy itself could be a contributing factor in case of Vithura. The expenditure thus increased is either affordable or manageable in most of the cases.

The direct impacts of these electrical appliances were examined, (Table 32). The majority of the households in all the panchayats seems to agree on a combination of factors like saving of time, labor and added to this is convenience. The first two reasons seem to be overriding opinion of the households surveyed. The convenience brought out in daily chores by the appliances seems to be a second factor. Saving of money alone doesn't have any taker, but this along with other factors have some impact.

The electrical appliances influence the quality of life of their users. An attempt was made to understand the merit of some of the factors resulting from the use of electrical appliances on the quality of life. Table 33 is the outcome of the analysis. As per the survey, utilization of spare time obtained by the use of the appliances seems to be an overriding factor in Ulloor and Vithura panchayats. All the factors studied namely, (1) fruitful utilization of spare time 2) widening the knowledge base and awareness (3) better equipped to remove drudgery and (4) more entertainment, all seem to contribute in Chirayinkeezhu that too with a overwhelming weightage. Electrical appliances seem to make the users better equipped to remove drudgery, perhaps, in the kitchen related activities in all the three panchayats. The use of these appliances results in creating more awareness and also providing entertainment depending upon the nature of use.

Different household appliances demand different grades of technology awareness to operate them. Hence, this survey attempted to find out the skills of varying degrees possessed by the members of the household (Table 34). The skills depend upon the nature of sophistication of the appliances. Those who know to operate have a high score followed by those who can operate with help. There are also members in the households surveyed in the three panchayats who can carryout minor repairs also. With further education, the skills of some of the persons, at least, can be developed so that they can carryout necessary repairs of the electrical appliances and even commercially, thus enriching the human resources.

It was sought to know whether the people face any constraints in the use of these gadgets. This has been brought out in Table 35. The power failure seems to be a constraint followed by the adverse effect that some of these appliances on children's education. It can safely be assumed that this pertains only to some of the appliances and not a general remark.

CHAPTER VIII

CONCLUSION

Attempts have been made in this study to bench mark certain dimensions of the growing role of household electrical appliances in our every day life. It has been observed that the consumers are the biggest and most significant group affected by technological change. Though they are singularly ill-organized, the massive growth of their expenditure card cannot be underestimated. It can be seen that this is a special case projected on the general canvass of application of science and technology for development. It needs to be mentioned at this point that technology is a different concept to define. This is because it is not a particular object but is rather a way of “doing” things and a way of “thinking”. It is opined that in the dynamic relationships between man, society and environment, technology has always been playing a dominant role. In the initial stage, technology evolved through trial and error. It is only in recent times that it got a qualitative change, opening up opportunities of creating new relationships between man and society.

This study is the culmination of an attempt at the micro level to bring out the problem concerning awareness, adoption and impact of certain innovations. The influence of technology through innovations cannot be underestimated, and the effects are mutual. It is said that technology has made large population possible and large populations have made technology indispensable. Often technology interact with society through innovations which need to have the sanctions of the market as against inventions which may not have practical applications. This doesn't mean that role of invention has to be underplayed since it is not generally realized that at what point of time an invention turns into an innovation. It is not without reason. Industrial innovations have come to be referred to as the “engines of growth”. It is to be noted that technology plays a major role in our life by changing the society, by changing our environment and the adjustment we make to them often modifies our social customs. For this, effective application of new technologies to traditional activities must entail improved human capabilities that keep pace with the pace of upgradation of technology.

Findings And Suggestions

Some findings and suggestions emerging from the study are listed below:

1. It seems that asbestos houses are not preferred by people. This may be taken into account when houses are built by various agencies for the economically weaker sections.

2. It is found that more land less people are in Vithura – a rural area.
3. The tendency towards nuclear families is on the increase and this may find use in the planning process.
4. Among the educated people more number of people are found to be degree holders. This requires further investigations and may be considered while planning for employment opportunities.
5. Still more can be done in the case of electrification of houses, especially, in the case of weaker sections and in rural areas.
6. More power generation will lead to more power consumption of electrical energy and the USA experience has shown that this leads to less electricity tariff.
7. The number of electrical appliances used in household is bound to increase in future and more three phase connections may be required. Hence reduction in cost of three-phase connection and the corresponding tariff may be welcome.
8. The study shows that there is enough scope for the penetrations of non-electrical energy sources like biomass, windmill etc. Use of LPG stoves and smokeless choolas should be promoted. All these will help in reducing the drudgery and improve health condition of women folk.
9. Of the household electrical appliances, refrigerator and washing machine consume comparatively more power. The appliances are making their dent slowly and surely in the households. A comparison of these appliances prevalent in other countries and the findings of the present study is given below:
10. The innovation of CFL has had a favorable and fast diffusion among the consumers. The message is that such innovations are welcome.
11. Apart from lighting, electrical appliances are used for entertainment, for reducing drudgery in kitchen etc. Appliances like computer, microwave etc are yet to make their presence

felt in these regions. Hence, an assessment of their requirements and further improvisations be a positive attempt in enhancing their penetration into households.

12. The effect of NRI phenomenon in Kerala has left their mark in the case of household appliances also. This effect gets multiplied when indigenous appliances same as or similar to the imported ones have diffused into household usage. It would be interesting to study this phenomenon also along with studies like money flow due to NRIs etc in Kerala.
13. Awareness about the appliances is created by a combination of factors like print and electronic media, personal contacts etc. This situation prevails in Kerala may be because of the high literacy. In other parts where literacy level is low, the process that creates awareness of household appliances needs to be studied.
14. It is seen that most of the households, generally, have procured electrical appliances due to necessity. These necessities might have existed before the diffusion of electrical appliances. Hence, it would be worthwhile to find out while other electrical appliances can be innovated further to improve the quality of life.
15. It is seen that prior knowledge about appliance seems to be a factor of overriding importance for people acquiring and adopting them. This may be true not only for appliances but for other gadgets also. Hence, before the introduction of any new product, process or program, it would be better to make the target group aware of this. This is applicable in general for planning process.
16. This study shows that, in general, women use the electrical appliances more than men. This may be due to various reasons like that some appliances are women-user oriented, women spend more time indoor and they are engaged more in managing household chores etc. After all, as the saying goes, women are homemakers and men are bread winners, though this scheme of things is undergoing a change now. Hence, it would be worthwhile to identify the target groups, (mostly women for these kind of products) and make them aware of the innovations.
17. People use these appliances out of necessity even if they are not affordable. This emphasizes the increasing role played by these electrical appliances as necessary household items. This is because they are found to be useful and even indispensable for

carrying out the household activities. Hence enough effort should be directed towards helping the people to procure these within their means without subjecting them to much hardships, financial or otherwise. This is an area where financial institutions can look into.

18. It is seen from that, normally, male members of the household are more influential in decision-making. But, there is also an emergence of a general trend wherein decisions are taken through discussions among all members of a family. This can have an overall effect in developing more harmony in society.

19. One of the findings of the study is that people, especially, women get more leisure and spare time as a result of using household electrical appliances. Apart from the usual way of spending the spare time in entertainment, they can pay more attention on children's education etc. Some of them have found time to get engaged in cottage industries. This helps to get additional income for the family. This means a greater role for women in the family, which would definitely improve their status within the household. Women's employment plays a considerable role in their empowerment. Not only that this will lead to better utilization of human resources but also to related development.

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Table 1 Distribution of average number of rooms and type of house

Type of Houses	Uloor		Chirayinkeezhu		Vithura		Total	
	No. of Houses	Average No. of rooms	No. of Houses	Average No. of rooms	No. of Houses	Average No. of rooms	No. of Houses	Average No. of rooms
Concrete	5	5.7	9	5.8	5	5.5	19	5.6
Tiled	9	5.5	-	-	3	2.2	51	3.4
Asbestos	-	4	-	-	3	3.7	4	3.8
Thatched	3	3.2	-	-	6	2.7	19	3
All Type	8	5.3	9	5.8	9	4.3	27	5

Table 2 Distribution of houses by type of house and ownership

		Concr ete	Tile d	Asb estos	That ched	Tot al
Ulloor	Ow ned	50	16	1	12	79
	%	56.8	18. 2	1.1	13.6	89. 8
	Re nted	5	3	-	1	9
	%	5.7	3.4	-	1.1	10. 2
	Tot al	55	19	1	13	88
	%	62.5	21. 6	1.1	14.8	10 0
Chirayink eezhu	Ow ned	89	-	-	-	89
	%	98.9	-	-	-	98. 9
	Re nted	1	-	-	-	1
	%	1.1	-	-	-	1.1
	Tot al	90	-	-	-	90
	%	100	-	-	-	10 0
Vithura	Ow ned	51	26	-	6	83
	%	54.8	27. 9	-	6.5	89. 2
	Re nted	1	6	3	-	10

	%	1.1	6.5	3.2	-	10.8
	Total	52	32	3	6	93
	%	55.9	34.4	3.2	6.5	100
Total	Owned	190	42	1	18	251
	%	70.1	15.5	0.37	6.6	92.6
	Rented	7	9	3	1	20
	%	2.5	3.3	1.1	0.36	7.3
	Total	197	51	4	19	271
	%	72.6	18.8	1.5	7	100

Table 3 Distribution of houses by size class of area of land possessed

Size of Land (cents)		Ulloor	Chirayinkeezhu	Vithura	Total
No Land	No	1	1	10	12
< 5	No	16	-	17	33
	Average	3.3	-	3.7	3.5
5-10	No	52	18	25	95
	Average	6.7	8.3	8.04	7.4
11-25	No	15	39	11	65

	Av	15.5	19.6	13.14	17.6
26-50	No	-	18	4	22
	erage	-	39.17	36	38.6
51-75	No	2	5	6	13
	erage	67.5	63	54.5	59.8
76-100	No	-	9	8	17
	erage	-	85	91.75	88.2
> 100	No	2	-	12	14
	erage	118	-	345.58	313.3
Total	No	88	90	93	271
	erage	11.4	30	24.8	34.9

Table 4 Distribution of house by type of family and average household size

type of family	Ulloor	Chirayinkeezhu	Vithura	Total
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	o. of households	ve. size		o. of households	ve. size		o. of households	ve. size		o. of households	ve. size	%
nuclear	2	.98	1.8	3	.67	2.2	8	.07	3.9	33	.89	86
joint	6	.35	8.2		.43	.8	5	.15	6.1	8	.68	14
Other type	8	.2	00	0	.81	00	3	.41	00	71	.14	10

Table 5 Educational status in the households surveyed

Educational Qualification		Ulloor		Chirayinkeezhu		Vithura	
		Male	Female	Male	Female	Male	Female
Below SSLC	o.	9	5	8	1	1	1
					1	3	7
		5	3.	4.2	5	7	9
		.45	2		.6	.6	.18
SSLC	o.	2	21	45	2	2	2
		0			5	0	2
		1	13	23.	1	1	1
		2.12	.5	6	2.8	1.76	1.9
PDC	o.	3	28	35	2	2	2
		7			7	1	5
		2	18	18.	1	1	1
		2.4	.06	4	3.8	2.3	3.5
Degree	o.	4	46	27	3	4	4
		0			3	1	1
		2	29	14.	1	2	2
		4.2	.6	2	6.9	4.1	2.2

PG	o.	1 0	17	23	1 4	3 1	2 0
		6 .06	10 .96	12. 1	7 .1	1 8.2	1 0.8
Dipl oma	o.	6	5	3	7	-	-
		3 .6	3. 2	1.5	3 .5	-	-
Nurs ing	o.	-	4	-	9	-	-
		-	2. 4	-	4 .6	-	-
Stud ents	o.	2 5	22	31	4 8	3 0	5 0
		1 5.15	14 .19	16. 3	2 4.6	1 7.6	2 7.2
Tota l	o.	1 47	14 8	172	1 74	1 54	1 75
		4 9.8	50 .2	49. 7	5 0.3	4 6.8	5 3.2

Table 6 Classification households on the basis of monthly income from various sources

	Ulloor	Chirayink eezhu	Vithura	Total
	No. of households	No. of households	No. of households	No. of households
Busi ness	23	8	11	42
Agric ulture	7	18	10	35

Service	50	43	74	167
Others	25	21	7	53

Table 7 Distribution of households by type of house and electrification

Name of Panchayat		Concrete	Tile	Asbestos	Thatched	Total
Ulloor	Electrified	54	19	-	11	84
	%	61.5	21.5	-	12.5	55.5
	Non-electrified	1	-	1	2	4
	%	1.2	-	1.2	2.3	1.5
	Total	55	19	1	13	88
	%	62.5	21.5	1.1	14.8	70
Chirayinkeezhu	Electrified	90	-	-	-	90
	%	100	-	-	-	100
	Non-electrified	-	-	-	-	-
	%	-	-	-	-	-
	Total	90	-	-	-	90

	%	100	-	-	-	00
Vithura	Electrified	50	30	3	1	84
	%	53.8	32.3	3.2	1.1	90.4
	Non-electrified	2	2	-	5	9
	%	2.2	2.2	-	5.3	9.7
	Total	52	32	3	6	93
	%	56	34.5	3.2	6.4	100
Total	Electrified	194	49	3	12	258
	%	71.5	18.1	1.1	4.4	95.2
	Non-electrified	3	2	1	7	13
	%	1.1	0.73	0.37	2.6	4.8
	Total	197	51	4	19	271
	%	72.6	18.8	1.5	7	100

Table 8 Distribution of houses by type of house and electrification

Name of Panchayat	Type of Houses	Concrete	Tiled	Asbestos	Thatched	Total
Ulloor	Single Phase	46	19	-	11	6
	%	54.8	22.6	-	13.1	0.5
	Three Phase	8	-	-	-	
	%	9.5	-	-	-	.5
	Total	54	19	-	11	4
	%	64.3	22.6	-	13.1	00
Chirayinkeezhu	Single Phase	72	-	-	-	2
	%	80	-	-	-	0
	Three Phase	18	-	-	-	8
	%	20	-	-	-	0
	Total	90	-	-	-	0
	%	100	-	-	-	00

Vithura	Single Phase	49	29	3	1	2
	%	58.3	34.5	3.6	1.2	7.6
	Three Phase	1	1	--	-	
	%	1.2	1.2	-	-	.4
	Total	50	30	3	1	4
	%	59.5	35.7	3.6	1.2	00
Total	Single Phase	167	48	3	12	30
	%	64.7	18.6	1.2	4.7	9.1
	Three Phase	27	1	-	-	8
	%	10.5	0.4	-	-	0.8
	Total	194	49	3	12	58
	%	75.2	18.9	1.2	4.7	00

Table 9 Distribution of NRI houses and imported electrical appliances

Name of Panchayat	No. of NRI Houses	No. of NRI Memebers	Non -NRI Members	Impor ted Appliances	Imported Appliances/No. of NRI Members
Ulloor	16	21	72	128	6.09
Chirayinke ezhu	58	59	32	448	7.59
Vithura	15	16	78	93	5.81

Table 10 Distribution of houses by type of family and status of electrification

Name of Panchayat	Type of Houses	Nuclear	Joint	All Type
Ulloor	Electrified	68	16	84
	%	77.3	18.2	95.5
	Non-electrified	4	-	4
	%	4.5	-	4.5
	Total	72	16	88
	%	81.8	18.2	100
Chirayinkeezhu	Electrified	83	7	90
	%	92.2	7.8	100
	Non-electrified	-	-	-
	%	-	-	-
	Total	83	7	90
	%	92.2	7.8	100
Vithura	Electrified	69	15	93
	%	74.2	16.1	90.3
	Non-electrified	9	-	9
	%	9.6	-	9.6
	Total	78	15	93
	%	78	15	93
Total	Electrified	220	38	258
	%	81.2	14	95.2
	Non-electrified	13	-	13
	%	4.8	-	4.8
	Total	233	38	271
	%	233	38	271

Table 11 Distribution of houses by type of family reporting members living abroad

Type of family		Ulloor		Chirayinkeezhu		Vithura		Total	
		No. of House holds	No. of persons living abroad	No. of House holds	No. of persons living abroad	No. of House holds	No. of persons living abroad	No. of House holds	No. of persons living abroad
Nuclear	No.	10	31	11	15	5	11	6	8
	%	1.4		6.6		6.12		8	
Joint	No.		7		5		-		12
	%	.5		.4			-		
All type	No.	14	20	15	15	5	11	4	9
	%	5.9		1		6.12		1	

Table 12 Distribution of house members working abroad by frequency of their visits to native place

Visits		Ulloor	Chirayinkeezhu	Vithura	Total
More than once in a year	No.	-	5	4	9
	%	8	9.09	26.67	10.71
Once in a year	No.	57.14	20	9	37
	%	6	36.36	60	44.04
Once in two years	No.	42.85	23	-	29
	%	-	41.82		34.52
Once in three years	No.	-	5	1	6
	%	-	9.09	6.67	7.14
Above three years	No.	-	2	1	3
	%	-	3.64	6.67	3.57

All	No	14	55	15	84
	%	100	100	100	100

Table 13 Distribution of houses by size class of monthly electricity bill

Size class of electricity bill (Rs)	Ulloor		Chirayinkeezhu		Vithura		Total	
	o. of House holds	ve.bill (Rs)	o. of House holds	ve.bill (Rs)	o. of House holds	ve. bill (Rs)	o. of House holds	Ave. bill (Rs)
< 50	4	6.4	2	0	4	3.6	2	43.5
51-100	8	9.2	4	2	8	1.8	2	81.8
101-200	11	61.7	7	38	3	58.2	27	155.7
201-300	22	35	7	79	1	55	3	267.8
301-400	3	50	2	51	3	-	6	350.9
401-500	-	-	-	46	-	-	-	446.9
> 500	7	50	-	-	-	-	-	750
All type	44	65	10	25	44	34	58	176

Table 14 Distribution of houses by type of electric supply and average electricity bill

Panchayat	Ulloor		Chirayinkeezhu		Vithura		Total	
	No.	Ave. Bill	No.	Ave. Bill	No.	Ave. Bill	No.	Ave. Bill
Single phase	76	161	72	205	24	134	30	165
Three phase	8	205	118	305	16	160	8	266
All Type	84	165	190	225	40	134	58	276

Table 15 Distribution of houses in possession of non-electrical energy equipment

Non-electrical energy equipment	Ulloor	Chirayinkeezhu	Vithura	Total
Bio-gas Plant	3	1	2	6
Wind Mill	-	-	-	-
Improved Chullas	14	3	7	24
Solar Cooker	-	-	-	-
LPG Stoves only	47	70	58	175
Kerosene Stove only	6	2	8	16

Improved Chullas + LPG Stove + Kerosene Stove	6	.8	8	.8		.6	3	.6
LPG Stove + Kerosene Stove	12	3.6	6	.6		.6	7	.9
Total	88	00	90	00	3	00	71	00

Table 16 Distribution of houses possessing electrical appliances and average number

	Ulloor		Chirayinkeezhu		Vithura		Total	
	No. of Households	Average	No. of Households	Average	No. of Households	Average	No. of Households	Average
Telephone	5	.81	5	.08	1	.01	231	.32
Bulb	1	.73	4	.62	1	1.52	216	.44
Telephone	1	.08	7	.09	6	.3	204	.15
Emergency lamp	0	.08	8	.12	7	.22	145	.12
Calculator	9	.1	4	.19	5	.53	148	.27

L	C.F.	0	.36	4	2	.29	5	1	1	89	2
o	Radi	4		3	2		3	6	1	110	1
o	Audi	3		8	5		2	4	1	133	1
o	Vide	1		3	5		1	1	1	75	1
	TV (Black & White)	4			3			7	1	24	1
	TV (Colour)	8		9	7		0	6	1	187	1
	Co mputer			9	1			3	1	22	1
	Elec tric pump			6	4		5	2	1	76	1
	Wa shing Machine	4		4	6		7	1	1	95	1
	Mixi e	8		9	7		5	5	1	182	1
	Hot Plate			6	4			4	1	57	1
	Refri gerator	3		2	8		8	4	1	183	1
	Oth ers				4			-	-	4	1

Table 17 Percentage of households using electricity for different purposes

Purp oses	Ulloor		Chirayinkeezhu		Vithura		Total	
	o. of Hous ehold s		o. of House holds	%	o. of House holds	%	o. of Hous ehold s	%
ng	4	5.5	0	00	4	3.3	58	96.4
ing		.9	0	5.6		.2	9	48.1
Ente rtainment	1	0.7	4	3.3	8	3.1	96	94.1
Other kitchen equipment	8	6	4	3.3	1	4.1	83	73.6

Other	5	3.9	0	00	1	6	0.9	7	21	83.6
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Table 18 Distribution of household electrical appliances and type of houses

Type of house	Ulloor				Chirayinkeezhu				Vithura			
				otal				otal				otal
Concrete		0	0	5		5	5	0		2	5	9
Tiled		4		1						5	2	2
Asbestos												
Thatched				0								
Total	4	8	4	6		5	5	0		7	9	4

Table 19 Distribution of houses that use electrical energy appliances and their average monthly electricity bill

Electrical appliances	Ulloor		Chirayinkeezhu		Vithura		Total	
	No. of Households		No. of Households		No. of Households		No. of Households	
A	16	03	-		13	8	29	6
B	45	82	25	61	34	36	104	63

C	23	81	65	38	37	51	125	02
Total	84	66	90	18	84	41	258	74

Table 20 Electrical appliances and single/three phase

Electrical appliances	Ulloor			Chirayinkeezhu			Vithura		
	Single phase	Three phase	Total	Single phase	Three phase	Total	Single phase	Three phase	Total
A	1	-	1	-	-	-	1	-	3
B	4	-	4	2	4	5	3	1	4
C	1	8	2	5	14	5	3	1	7
Total	7	8	8	7	18	20	8	2	4

Table 21 Classification on the basis of awareness of electrical appliances

	Ulloor	Chirayinkeezhu	Vithura	Total

	o. of House holds		o. of House holds		o. of House holds		o. of House holds	%
Media/Newspaper+ Magazines (1)								
Journals (2)								
T.V (3)								
Radio(4)								
Friends &Relatives (5)								
(1)+(3)+(4)	1	3.1	3	5.6	2	4.2	6	7.8
(1)+(3)+(4)+(5)	2	6.2	4	6.7	2	6.2	8	6.3
(1)+(2)+(3)+(4) + (5)	3	5.5	9	1.1	2	4.2	4	7.1
(1)+(3)	8	3.3		.6	0	1.9	3	6.7
(1)+(3)+(5)	0	1.9	9	1.1	8	3.5	7	2.1
Total	4	00	0	00	4	00	58	00

Table 22 Showing dissemination of information

Name of Panchayat	Yes		N		Total	%
Ulloor	62	3.8	2	6.2	84	00
Chirayinkeezhu	59	5.6	1	4.4	90	00
Vithura	54	4.3	0	5.7	84	00
Total	175	7.8	3	2.2	258	00

Table 23 Classification on the basis of necessity of electrical appliances

	Ulloor	Chirayinkeezhu	Vithura	Total

	No. of Households		No. of Households		No. of Households		No. of Households	
es	88	00	90	00	93	00	271	00
o	-		-		-		-	
otal	88	00	90	00	93	00	271	00

Table 24 Classification on the basis of adoption of electrical appliances

	Ulloor		Chirayi nkeezhu		Vithur		Total	
	o. of House holds		o. of House olds		o. of House olds		o. of House olds	%
Knowledge about the Equipment (1)	0	9.5	7	8.9	0	9.5	17	45.3
Prior familiarity with their Operation (2)				.2			2	0.78
Necessary income to purchase them (3)		.5		.7		.5	2	8.5
(1)+(2)			7	8.9			7	6.6
(1)+(3)	3	7.3		.3	3	7.4	9	19
(1)+(2)+(3)		.7	5	0			1	19.8
Total	4	00	0	00		00	58	100

Table 25 Classification on the basis of pattern of use of electrical appliances

	Ullloor	Chirayinkeezhu	Vithura	Total
Men Only	1	9	10	0.8
Women only	47	49	43	139
Both	35	40	29	104
Children	2	-	3	2
All	-	-	-	3
Total	84	90	84	258

Table 26 Showing procurement of electrical appliances on the basis of affordability

	Ullloor		Chirayinkeezhu		Vithura		Total	
	No. of Households		No. of Households		No. of Households		No. of Households	%
Men	84	5.5	76	4.4	69	2.1	229	87.4
Women	4	.5	14	5.6	15	7.9	33	12.7
Total	88	6.0	90	6.0	84	6.0	262	100

Table 27 Table showing the factors influencing the purchase of electrical appliances

	Ullloor	Chirayinkeezhu	Vithura	Total

Availability of finance (1)	0	2	3.8	17	8.9	2	2	6.2	9	2.9
Immediate requirement (2)	0	3	5.7	14	5.6	0	2	3.8	4	4.8
Any other factor				-			-			
Both (1)+(2)	4	3	0.5	59	5.5	2	4	0	35	2.3
Total	4	8	00	90	00	4	8	00	58	00

Table 28 Role of woman in decision making process

	Uloor	Chirayinkeezhu	Vithura	Total
Herself	9	-	1	10
By Male Members	1	8	8	30
By Both	3	49	3	11
Thorough discussion	2	33	4	10
Total	4	8	00	25

Table 29 Changes in lifestyle after adopting electrical appliances

	Uloor	Chirayinkeezhu	Vithura
Increase in use of consumer items	24	55	15
Increase in food items	18	39	9
Increase in electricity consumption	21	35	39
Saving of money	-	-	-
More leisure time activities	46	43	21

Table 30 Classification on the basis of utilization of leisure time obtained by electrical appliances

	Uloor		Chirayinkeezhu		Vithura	
	No. of Households		No. of Households		No. of Households	
Enhance the knowledge by reading newspaper	44	2.3	52	7.8	20	3.8
More attention to children's education	24	8.5	53	8.9	20	3.8
Watching T.V, listening to the radio	67	9.8	64	1	54	4.3
Facilitate part time jobs like cottage industries	4	.8	19	1	3	.6
Other engagements	2	.4	6	.7	7	.3

Table 31 Classification on the basis of shift in expenditure after the adoption of household appliances

		Uloor		Chirayinkeezhu		Vithura		Total	
Increased	Affordable	7	.3	20	2.2	2	5	8	8.6
	Manageable	57	7.9	55	1.1	30	5.7	42	5
	Others	20	3.8	15	6.7	3	9.3	8	6.4
Decreased		-		-		-			
No change		-		-		-			
Total		84	00	90	00	48	00	58	00

Table 32 Classification on the basis of direct impact by the utilization of electrical appliances

	Uloor	Chirayinkeezhu	Vithura	Total	%
Saves time (1)	-	2	5	7	2.4
Saves labour (2)	6	-	-	6	2.3
Saves money (3)	-	-	-	-	-

Convenience (4)	15	7.9	34	7.8	10	1.9	59	2.9
(1)+(3)	-		-		-		-	-
(1)+(2)	-		-		10	1.9	10	3.9
(1)+(2)+(3)	1	.2	3	.3	7	.2	11	4.3
(1)+(2)+(3)+(4)	6	.1	-		5		11	4.3
(1)+(2)+(4)	51	0.7	48	3.3	47	6	146	6.6
(1)+(3)+(4)	5	.95	3	.3	-		8	3.4
Total	84	00	90	00	84	00	258	100

Table 33 Classification on the basis of direct impact of electrical appliances on the quality of life

	Ulloor	Chirayinkezhu	Vithura
Utilization of Spare time(1)	51	18	40
More Awareness (2)	46	-	22
Better equipped to remove drudgery (3)	41	33	20
More entertainment (4)	35	-	23
Economic benefit	3	-	2
1)+(2)+(3)+(4)	-	63	-

Table 34 Classification of households on the basis of grade of technology awareness

	Ulloor		Chirayinkeezhu		Vithura	%
Knows to operate	79	4	90	00	55	66
Can operate with help	26	1	60	7	25	30
Can carryout minor repairs	12	4	40	4	13	16
Others	-	-	-		-	-

Table 35 Constraints in utilization of electrical appliances

	Ulloor	Chirayinkeezhu	Vithura
Power failure	75	76	50
Adversely affect children's education	9	8	14
Health problems	2	5	14
Power consumption	6	7	-
Any other	-	-	-