IMPACT OF EDUCATION ON CONSERVATION OF HOUSEHOLD RESOURCES BY RURAL FAMILIES

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CERTIFICATE

This is to certify that the thesis entitled "**Impact of Education on Conservation of Household Resources by Rural Families**" submitted to Avinashilingam Institute for Home Science and Higher Education for Women (Deemed University), Coimbatore, for the award of the Degree of **Doctor of Philosophy in Home Science Extension Education** is a record of original research work done by **S.RAJALAKSHMI**, during the period of her study in the Home Science Extension Education, Avinashilingam Institute for Home Science and Higher Education for Women (Deemed University, Coimbatore), under my supervision and guidance and the thesis has not formed the basis of the award of any Degree/Diploma/Associateship/ Fellowship or similar title to any candidate of any University.

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DECLARATION

I hereby declare that the matter embodied in this thesis titled, "**Impact of Education on Conservation of Household Resources by Rural Families**", submitted to Avinashilingam Institute for Home Science and Higher Education for Women (Deemed University), Coimbatore, is the result of investigation carried out by me in the Home Science Extension Education, Avinashilingam Deemed University, under the supervision of **Dr. N.S.NARAYANASWAMY**, Professor, Home Science Extension Education, Avinashilingam Institute for Home Science and Higher Education for Women (Deemed University), Coimbatore and it has not been submitted for the award of any Degree/Diploma/Associateship/ Fellowship or similar title of any other university or institute.

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INTRODUCTION

Women are the key persons around whom the family, the society and the whole community move. The world economic profile reveals that women represent 50 per cent of the world's population, 30 per cent of the official labour force and perform 60 per cent of all the working hours, possess 10 per cent of the world's property. Women are the creators and sustainers of the family.

The women in rural areas, work hard from dawn to dusk to perform multiple tasks ranging from household chores of cooking, washing, cleaning, caring children and the farm activities in a traditional manner which take most of the time and energy. Women are the nucleus of family life and pace setters in resources development and management of home and farm.

Rural women are subjected to the double burden of income earning and household responsibilities. Most of the women in the rural areas spend a major part of their day in poor ventilated and ill-lighted houses, cook in smoky kitchens, fetching fuel, fodder and water from long distances under stressful conditions, bear a number of children, rear them in an unhealthy way and live in a filthy, hazardous environment. All these adversely affect their productivity and contribution to the family and the community.

Now-a-days household technologies are attaining more importance as they serve as major catalysts for any development to take place in the rural areas. Rural women form an important segment of our society, both by their numbers and the hours they spend at home, farm and dairy activities.

All work which entails unpleasant, back-breaking, monotony and which affects physical and psychological well-being must be reduced or avoided as far as possible. The work of women from morning till evening consists of chores that have a large element of drudgery.

By making her literate, by providing her better health facilities or by developing her occupational skills, the drudgery of her household work could be reduced which may enable her to take advantage of the new opportunities. Resources play an important role in management of the home. Management of family resources has been an important issue in the context of the progress and development of the nation. Management is the science and art of getting things done through people in a particular manner within the given time by effective utilization of resources and directing their energies to bring in effectiveness and efficiency.

Any resource whether available in abundance or in limited quantity, is to be managed effectively to get the maximum benefits.

Homemaking is the supreme responsibility of women. Therefore, success in a woman's life is still rated and reflected in the efficient management of her home and the progress and prosperity of her family.

Conservation should be the key word to extend the availability of any resource. The careless, thoughtless haphazard use of resources results in their fast depletion. Conscious management of resources is one step forward towards growth and prosperity of the nation. Therefore, one should be resource-minded.

Waste, an unwanted material often turns out to be a resource, if put to use in an appropriate manner.

There is a need to reduce the work load of women by improving the basic infrastructure to relieve some of the necessary but unproductive tasks that women must carry out. These include provision of regular water supplies, improving and maintaining the supply of fuels and improving basic household technologies.

Most rural homes have limited exposure to scientific and technological information. Consequently, most of the household work continues to be performed by rural homemakers in the traditional manner with a high level of drudgery and highly detrimental to health and environment. Till now not

much effort has been made in rural household technologies which are suitable for low income rural families.

As most of the facilities are absent for the rural homemaker, it is in the fitness of things to introduce drudgery reducing technology, which can very effectively allow a greater conservation of time, energy and fuel, coupled with a sense of tremendous relief to the rural homemaker, who is answerable for the performance of a number of chores of activities within and outside her home.

Low cost appropriate technologies would serve to hasten the process of cooking, reduce drudgery and at the same time conserve fuel.

Resources are means which are available and recognised for their potential. Resource management constitutes a challenge to management and is the key to success in homemaking. If the rural women adopt and also use appropriate technologies in the household activities, the productivity of these women is bound to enhance as a result of relief from household drudgeries. They become economically emancipated as they can take part in other economic ventures by saving time through appropriate technologies. Therefore, output of women's labour can be improved through better health, nutrition and environmental

sanitation. Appropriate technology can thus serve as an important tool to improve the pattern of living and ultimately the standard of living of the rural masses.

The application of science and technology has gradually weaned women from their daily routine and has tremendously changed their standard of living and would go a long way in alleviating or reducing many of the drudgeries.

Work simplification is the technique of accomplishing a task by using the least amount of time and energy. The rural homemakers will feel happy to seek any low cost cheap device for the simplest, easiest and quickest way of carrying out any of her tasks, if her work is made easier.

Good household equipment is a boon to homemakers as it helps in effective home management, resulting in increased production in the home and also saving enormous amount of time, money and energy. Equipment plays a very important role in reducing the physical and mental work load of homemaker and provides a lot of satisfaction to the homemakers and their families. The area which needs the labour saving equipment most is the kitchen, which is the nerve centre for all the important household activities for women in the Indian homes.

Usage of proper labour saving devices for the respective household chores is one of the important factors in improved methods of work performance in household work. In today's rapidly changing environment, knowledge-possession and skil ful operations of labour saving devices are necessary for the efficient accomplishment of household tasks.

The progress implies change-change in pre-determined desirable directions. But no worthwhile progressive change in any sphere anywhere is possible without women accepting the change. In order that women accept the change and contribute fully to the development in any field, whether in the home, in the work place or in society, it is essential to first develop their potentiality by improving their knowledge, attitudes and skills with as much regard for long-range consequences as for short term gains (Punia, 1992).

Education helps to raise the status of women in a big way. Education has been recognised as one of the most significant instruments for changing the status of women. Education equips a woman to carry out her roles as house-wife, mother, citizen and earner in the family much more efficiently and it is because of this that woman's education is universally treated as a basic ingredient for improving

her status. Through education, women become more aware about the quality of life. The home science education helps in the utilization of resources of modern science to improve and strengthen the home and family life.

In the sixth five year plan (1980-85), the Department of Science and Technology of the Government of India has introduced the scheme of science and technology for women with the broad objectives of improving the life and status of women through the application of science and technology for ensuring greater contribution of women in the developmental programmes of the nation. The transfer of technology to the rural homemakers has been carried out by the different organisations and government departments for the past two decades. Inspite of the vast amount of work done so far to transfer the technology to rural homemakers and the various evaluations made by different organisations, we do not have clear-cut concrete evidence to show the usefulness or otherwise of the scheme. Hence the investigator felt it worthwhile to undertake an action programme to propagate the science and technology to a selected band of rural homemakers in Coimbatore district and to investigate the impact of the scheme on them as to how the application of science and technology has simplified the domestic chore of activities of the rural homemaker to

conserve the resources like time, money and energy in terms of certain parameters with the following objectives :

1. To find out the existing patterns of rural household practices with regard to the use of low cost household technologies.
2. To identify the various household technologies appropriate to the rural areas with regard to conservation of resources in accordance with the socio-economic condition of the locality.
3. To introduce selected low cost household technologies to the rural homemakers and to motivate them to practise these technologies in their homes to save time, fuel and money.
4. To evaluate the impact of the introduction of low cost household technologies on the rural homemakers.

It is hoped that the findings of the study will help to improve the scheme further and lead to full attainment of its goal.

Operational definitions of key concepts

The family is a group of persons united by the ties of marriage, blood or adoption, constituting a single household, interacting and inter-communicating with each other in their social role as husband or wife, mother and father, brother and sister, creating a common culture.

Nuclear family is composed of husband and wife and their immature children and constitutes a unit apart from the rest of the community.

Joint family is one which is characterised by co-residence, community living on equal terms and often joint property and some common family cult.

Household : A group of related or unrelated people sharing the same housing unit, excludes group living in dormitories and the like.

The homemaker is the centre figure in the home, who guides the other members in discharging their responsibilities. Homemaking is considered as the unpaid labour mainly carried out by the homemaker.

Household technology is that used by people in household activities to fulfil their wants and needs.

Low cost technology means it is low priced and easy to purchase, fabricate and be utilized by the people.

Conservation means to preserve or avoid loss or waste.

Resources are source of supply. Resources are of two types i.e., human and non-human. It includes materials and non-materials i.e., time, money, energy, land, water, fuel, ability, knowledge, skill and attitude.

Labour saving devices are those devices that save time and energy of the homemakers while doing household tasks.

Fuel means which is used for cooking or heating. Wood is the poor man's fuel. More than one-third of the world's population depends on wood for cooking and heating.

The soak pit is a simple device for soaking and transferring waste water to the sub-soil from bathrooms, washing areas and kitchens.

Limitations of the Study

Due to the limitation of time, lack of finance, transport facilities and conveyance, the investigator confined her study to Kovanur, Mathampalayam and Palanigoundenputhur of Periyanaickenpalayam block of Coimbatore District.

Review of Literature

II. REVIEW OF LITERATURE

The literature pertaining to the study "Impact of Education on Conservation of Household Resources by Rural Families" is reviewed under the following headings:

A. Household Tasks of Women

B. Science and Technology to Reduce Drudgeries of Homemakers

C. Conservation of Household Resources

D. Conservation of Household Resources Through Education and

E. Related Research Studies.

A. Household Tasks of Women

For centuries, Indian women's role has been domestic while their husbands assumed the responsibilities of bread winner and protector of the family (Indu et al., 1995).

Joshi (1994) exhorts that traditionally women were expected to work at home and this was considered to be most essential for the sustenance of the family. Women accepted housework as their fate, their life. This work did not fetch them any status except some references of respect and gratitude. They were considered backward without 'mind' or 'soul' and were not consulted for decision making in family matters.

As per traditions, women have to do all the work of the home as well as to take care of children and other family members. They face physical and mental drudgeries. They engage themselves mainly in fetching water from long distances and deep wells, collecting fuel, cooking in smoky environment with traditional methods of work, looking after children and household chores, cleaning of house and clothes, serving food, repairing and maintenance of house and so on. Women's domestic work is of course socially productive also in as much as it contributes to the reproduction and maintenance of labour. The characteristically female tasks of cleaning, cooking, shopping and so on, in contrast, tend to be repetitive essential tasks which have to be fitted into some sort of daily or near daily routine (Scarlett Epstein et al., 1986).

Swaminathan (1985) feels that Indian woman spends a lot of time and attention to her role as a daughter, daughter-in-law, wife, mother and as unpaid household worker to perform the traditional tasks of cleaning, cooking, child care and housekeeping. She is burdened not only by multiple roles, but by multiple jobs, which lead to great stress and strain.

Women are primarily, if not exclusively, responsible for domestic and food production activities. These

activities include fetching and carrying water for drinking, cooking, washing and irrigation purposes, securing energy materials, processing and cooking food (Schumacher et al., 1980).

The women folk are greatly subjected to drudgery specially in the following chores: (a) walking long distances to fetch water and drawing water from deep wells, (b) collecting fuel for a major part of the day (partly to sell, partly to use for own cooking), (c) cooking in smoky environment, consumption of more fuel and loss of heat due to faulty oven chulah, traditional utensils and time consuming cooking process and (d) transplanting paddy by standing in water continuously in a bending posture.

As if all this drudgery was not enough, they have to take care of the physical comforts of the men folk mostly in one room tenament shorn of privacy. They have to give birth to children, nurse them, care for them at any cost without adequate diet and nutritional input. In homes, it is the women folk who are responsible to maintain the drought and milch cattle, piggery, poultry, sheep and goat. All these tasks entail much outlay of energy by women and cause excessive physical and mental burden, fatigue and multiple stresses (Srivastava, 1985).

According to Seema and Malaviya (1991), Indian women, more specially the rural women, play multifarious socio-economic roles both at home and farm. Rural women in our country share abundant responsibilities and perform a wide spectrum of duties in running the household and family like child care, collection of fodder and fuel, cooking, washing and sewing as well as attending to farm activities, dairy, animal husbandry and extending a helping hand to handicrafts. Thus, rural women are an important segment of our society. Besides being homemakers, they have been time honoured partners to men in the field of agriculture and rearing live stock.

Gathering, sowing, cooking, washing clothes - these and many more are the tasks performed by millions of women every day of their lives. Despite some progress in correcting unequal gender relations, such tasks remain primarily women's work. Further more, when forests recede, women walk farther to collect their daily load of fuelwood. When the water table falls, they must search harder and longer for water.

Technological innovations have rarely addressed the need to lighten the load on women, particularly poor women in rural areas. The fact that millions of women must spend hours before inefficient smoky cooking stoves which are

deleterious to their health was never considered an important problem (The Hindu, 1995).

A woman needs to be viewed as a partner in bringing up children, management of the household and in dealing with matters concerning family and the community. The tendency to place the entire burden of responsibilities on woman in the roles traditionally assigned to her, merits correction. A woman can perform her role as a mother in the physical, moral and social relationships and day-to-day living, once she is educated in child development, hygiene and nutrition, household management, social relationships and day-to-day living. It is also largely dependent on the time and respite she gets from routine household chores and above all on the understanding, support and assistance she receives from her husband and other members of her family (Bhaskaran, 1989).

Devadas (1992) states that women are responsible for a number of activities connected with the maintenance of good health, purchasing, preparing and serving food, providing a clean and safe environment, water supply and personal hygiene, procuring preventive and curative health services. Women are the crucial link between the family and the traditional and modern health systems.

Bhagat (1993) opines that women, who form almost half of the population of India, are important components of social change. In the rural societies as well, the role of women in social change and development has been repeatedly emphasised. In fact, women have been equal partners in all rural activities which lead to higher socio-economic standards and ultimately improved life style.

Women are responsible for producing a large share of crops, food preparation, homemaking, fetching water and fuel, feeding the animals, nutrition and health care, looking after children, the elderly and sick. They are responsible for physical and mental development of the next generation. A woman works approximately double to that of a man. Still her work is invisible and she is marginalised in decision making and has no means of production, technology, education, training, credit, etc. Their participation has been reduced to mere sharing responsibilities due to erroneous notions that 'women do not know', 'women cannot understand', 'women are not interested' (Singh, 1989-90).

The place of women in the society is determined by their unique dual roles in the family and the country (Devadas, 1986). Women are the caretakers of the home and majority of them work with little or no financial reward for as many as 13 to 16 hours a day. There is no denying of the

fact that they perform a variety of tasks without which families and communities would simply collapse (UNICEF, 1985). They have the talent and motivation to improve the quality of life in their communities. They have something substantial to contribute to the community as a whole because they are a key human resource in development programmes (Gulhati, 1990).

B. Science and Technology to Reduce Drudgeries of Homemakers

Rural development seeks to involve a process of transformation from traditionally oriented rural cultures towards an acceptance of reliance of science and technology (Patel, 1983).

Technology is a part and parcel of social system and thus, it is essentially, social in nature. Today's society is 'information-rich' and 'technology-intensive' which calls for new approaches and techniques of learning. Technology plays a fundamental and direct role not only in production promotion but also makes the users efficient in terms of 'technology-knowledge', 'technology-use' and 'technology-minded', which transforms the human personality (Mukhopadhyay, 1988).

Technology in general is defined as "an integrated set of techniques pertaining to modes of living and mediating between society and environment. Technologies as techniques affect the ways in which people do things, technologies as systems of knowledge affect the ways in which people think about what they do. Technologies are not value-free or value-neutral. They are embedded in and carry social values, institutional forms and also reflect resource endowments and organisations of practice (Papa, 1989).

Science and Technology are important instruments for improving the lot of the rural poor specially women minimising the drudgery among the working women, enhancing sanitation and reducing health hazards with a view to achieving improvement in the quality of life. As a matter of fact, science and technology are the most powerful instruments to contain poverty and unemployment among women in rural areas (John, 1987).

Technologies exist which could benefit both women and their families in the provision of these basic needs. Rain water catchment tin roofs, hydraulic ram pumps, shallow well pumps and other water lifting devices effectively and simply reduce the burden of water acquisition; solar cooker, biogas and improved cook stoves can improve the efficiency of energy use and lessen the drudgery (Carr, 1979; Tinker, 1979 and Staudt, 1979).

The 'Labour saving' technologies are crucial in so far as they address a major constraint inhibiting women's productive activities, that is, the time spent for carrying out these household responsibilities (Carr, 1979, Tinker, 1979 and Staudt, 1979).

The positive implications of technology are to improve working conditions and to disseminate information to improve communication. However, there are some negative implications too like displacement of women workers from employment, poverty in poorest of poor households, widows, handicapped, old women, etc., decline in women's economic activities thus lowering their economic status. It pushes women back to manual drudgery. The reasons for negative implications are due to biased traditions, customs and values, rigidity in implementation .of sex roles, overglorifying of roles of motherhood (Chandra et al., 1993).

According to Kalbagh (1991), realising that economic independence would accelerate the improvement in the status of women, the Government started various schemes including that entitled "S and T for Women" during the Sixth Plan.

Appropriate technology should look to the condition of the poorest of the people and gear up to their need which can come as close as possible to the price of survival or low cost technology (Singh, 1981).

Gurusamy (1984) expresses that the term "Appropriate Technology" means an application of knowledge and technical methods which are appropriate to the socio-economic environment of the country concerned.

FAO (1987) states, that the introduction of appropriate and better technologies for domestic and on-farm activities will make a vital contribution to reduce women's drudgery. Women's labour, energy and time constraints will be substantially reduced by the provision of child-care facilities and easy access to safe drinking water, fuel and fodder. Technologies which are essential to reduce women's drudgery and yet, at the same time, are too expensive for an individual woman.

Technology is an important ingredient in the process of development. The process of socio-economic development should be looked upon as the production of appropriate goods and services that are compatible with the dynamically changing endowment of natural resources and the socio-economic environment of the country. The appropriateness of technology depends on a comparison of the requirements of success with the availability and for adaptability of indigenous resources (Saxena, 1992).

For rural India, the inputs of science and technology have been very meagre even though there exists immense potential for the growth of this area. All the areas of human activity can be benefited by proper application of science and technology. The introduction of new ideas in a rural area is highly complex and sensitive. This must be attempted with caution. The association and involvement of local people is a 'must' for the success of any programme (Johny, 1987).

The application of new scientific and technological devices and knowledge may lighten household drudgery in urban and rural areas, providing better water, energy and other community facilities. This would release energies which women might be encouraged to direct towards active and useful participation in other economic and social areas and in the overall technological transformation of the society. Some of the difficulties faced by rural women are those relating to fuel wood collection and its use in the smoke-filled kitchen, fetching of drinking water from distant places and its storage, occupation hazards in reeling of cocoons, shelling of cashewnuts, making bidis and coir products and various agricultural operations. All these difficulties can be solved by selecting suitable technologies acceptable to the target group. Selection would

depend upon apart from employment generation and drudgery reduction, improvement of health and nutrition and prevention of hazards. The technologies also should be rid of economic risks. Towards this end, there is a need not only to provide training in technical skills but also to introduce a component of achievement motivation and building up of self-confidence in women so that they can face the challenges of a developing society fearlessly (John, et al., 1988).

The technological development/transfer/communication is however, an uphill task in view of the high rate of illiteracy, customs, traditions and other prevailing constraints in the rural society. In such a situation the economic development, a great challenge, can be successfully met with the support of the media, effective communication and right choice of information which in turn, can reach the rural women at the remote places with the technological packages and convince them in using the technologies.

The key to rural development lies in the mind, heart and hands of the rural people. It is the motivated technology which mostly release the lock and swing open the doors to modernisation. The uppermost force which accelerates the process, is the effective dissemination of adequate information (Seema and Malaviya, 1991).

The desired changes in the women's life can be brought about by the use and application of simple scientific technology (Sharma, 1990).

Development is the goal and the technology is the means. Appropriateness depends on the time and space, to which, the human beings belong. Appropriate technology has been defined as an approach in which technical innovation and adoption go hand in hand with social and cultural integration. It is not defined in terms of the high-level technology used, but by the attention given to adopting the technology to the local environment. To achieve development from within, a population requires working with people in their existing situation, with their existing resources and skills. This definition emphasises reliance on the locally available inputs of skills and resources called as "affordable technology" instead of "appropriate technology" (Greo-clough, 1985).

C. Conservation of Household Resources

Gross et al. (1980) and Chandra et al. (1993) classify resources into different groups, namely, human versus non-human resources. Human resources include: time, energy, interest, intelligence, abilities or skills, knowledge, attitudes, creativity, awareness and standing plans. Human resources can be further classified as personal and inter-

personal. Non-human resources include ! material goods, money, space and power.

Economic versus non-economic resources. Economic resources include: money, material goods, time used in consumption and energy used in production, productive skills, services for self or others, knowledge, human capital in the form of educated person and space. Non-economic resources include; materials, goods with historical or sentimental value, social skill, effective routine, interests, awareness, privacy, love, loyalty and pride.

Economic resources are transferable and measurable while non-economic resources cannot be exchanged or converted into materials.

Kaur and MaCneil (1989) classify resources as human and material resources. Human resources are skill, interest, knowledge, abilities and attitudes of the members of the family. Material resources of the family include immovable property such as houses, shops, land, etc., as well as movable resources like money, jewellery, family, equipment and furnishings, etc.

Deacon and Firebaugh (1975) recognize resources as tangible and intangible.

One of the fundamental process of home management is the assembling, mobilising and organising all the available resources towards accomplishing work in the home (Ray, 1985). Of the various resources, the three most frequently utilized are time, energy and money (Gross and Crandall, 1980 and Kaur and Macneil, 1989).

Our very lives depend upon the availability and use of both human and non-human resources. The most important resources considered by Gilbreth et al. (1970) and Deacon and Firebaugh (1981) are time, energy and money.

Indira Gandhi National Open University (1993) (IGNOU) states that human resources are the capacities and characteristics of individuals. Some resources are a part of an individual and can be used only by that person. Such resources are called 'human resources' such as energy, time, skills and abilities and knowledge.

At the same time, there are some resources which are available for everyone to use.

Money does not belong to any one person only. The money that you have can be used by your sister also. A community facility like a park can be used by each and every member of our society. Such resources are known as 'non-human resources' such as money, land, material goods and community facilities.

IGNOU (1993), Ray (1985) Varghese and Ogale (1985), Mann and Mann (1982), opine that resources are classified and discussed under the following aspects :

Knowledge

To gain knowledge is a continuous process. It starts in cradle and ends in the grave. In home management, the housewife is required to remain alert to new and advanced ways of performing different tasks, the most satisfactory yet economic way of running the home, the modern methods of saving time and energy. This up-to-date knowledge will certainly help her and her family members to have utmost enjoyment of life. Such knowledge in home management includes understanding the principles of food and nutrition, selection, purchase, preparation and preservation of appropriate food stuffs at suitable time of the year, first hand information about the face value and intrinsic value of money while marketing, handling and repairing of a machine and electrical and kitchen appliances, formulative ideas about domestic arithmetic, payment of taxes, current information about postage and banking and textile and clothing.

Skill and abilities

Skill and abilities are considered as most important human resources available in the family. Some of these

skills are inherited whereas others are acquired through learning and practice. New skills can be developed and old skills can be improved to make the management processes easier and economic. The skills and abilities of the housewife and members of the family range over wide areas beginning from cooking to creative arts and other serious intellectual pursuits. The husband may remain busy replacing the burnt out fuses, the son might do wonderful gardening and attend to painting work around the house, whereas the daughter might learn tailoring and use her newly acquired skill in stitching her room curtains, pillow cases. The housewife can learn new types of cooking and thereby improve her method of cooking and serve better quality food to her family members.

Time

Time resource in home management is unique of all other resources because it is equally available to all. There are 24 hours in a day and everyone spends in his or her own way. This is a most precious resource which once lost cannot be regained. Proper utilization of time can be learnt only through perseverance and practice. Time and tide wait for none. The time should be used in an economical way so that it means the most in the attainment of individual's and family's goals which form the real objective of the time management.

Energy

Energy is the basic requirement of man for the maintenance of life growth and physical out put. It means the ability to do work. The entire body processes of a human being like walking, sleeping, sitting, standing, lifting goods, etc., are being carried on through energy. The housewife too, needs energy to do her daily duties. She should learn to utilize her energy resources wisely for her intellectual and physical work whenever and wherever necessary. She should also see that while managing energy resources the available energy of all other members of the family is also properly and timely utilized.

Money

Human beings use their knowledge, skills and abilities to work and thereby earn a livelihood. Money resources vary from person to person. Some are rich and some are poor. Everybody whether rich or poor should plan her budget so that all the basic needs are fulfilled. Money is considered to be a very important resource as with money we can have better facilities in home.

All resources are useful and limited. The use of resources is interrelated. If one is in short supply, another one could be substituted. The managerial process is

applicable in the utilization of all resources. Their use determines the quality of life an individual or family has (Varghese and Ogale, 1985).

Resources are something which we use to reach our goals. All resources are useful. They help us to achieve our goals. A housewife uses her time, energy, skill and knowledge to prepare a healthy, balanced diet for her family. There are resources which may be useful to all e.g., money. But there are other resources which are useful to some and not useful to others, e.g., knowledge. Knowledge in a particular subject will only be useful to a student who wants to pass his examination but not useful to his father.

All resources are limited in nature. Time and energy are limited so they are to be used in such a way that maximum satisfaction is achieved. There are only 24 hours in a day for everyone and we have to finish all our work within this time. In the same way money is also limited so we need to spend it properly. Thus we have to expend all the resources in a most utilizable way so as to make them usable to achieve our goals.

All resources are interrelated : Decisions in family cannot be taken up with one or two of the several available resources but by simultaneous usage of all of them. For example, time and energy are interrelated for ability cannot

be expressed without using some time, energy and materials. Material goods are purchased with the help of money. Interests and abilities not only determine that what goods are needed to achieve desired goals, but also how effectively other materials can be used.

In home management, interrelated use of resources is very important than the use of specific ones. Indeed, it is the sum total of resources available for reaching a particular goal, which determines whether or not that particular goal will be achieved.

Home management, according to Nickell and Dorsey (1981) is a series of decision making activities constituting the process of using family resources to reach family goals.

Throughout history, management of family resources has been an important issue. Since all resources are limited, proper use of resource is not an easy task. Out of all the family resources, the most significantly used resources are time and energy. Conscious efforts to conserve energy and time are common among individuals who have many demands on their time. In the home, energy in relation to time is a woman's issue. It is an issue at the subsistence level where women supply that bulk of human energy for survival tasks of the whole family. It is an issue of modernising societies

where energy saving techniques too often undercut women's work (Devadas, 1989).

According to Mullick (1984), home management is the administrative side of family living and is the planning, controlling and evaluating the use of the resources of the family for the purpose of attaining family goals. Management is planning the use of resources and then implementing the plans to meet demands.

Resource management constitutes a challenge to management and is the key to success in home making. Varghese (1985) opines that the homemaker must recognise the serious limitations of time, energy, money and other resources which in turn reflect the efficiency of household management.

Resource management is the key to success in home making. The art of effective management of the family resources in a way that would bring greatest satisfaction for the family must be realised by the homemakers. Good management encourages intelligent use of resources, makes wise decisions, sets proper values and goals and improves the standard of life.

Varghese et al. (1985) consider wise decisions and effective use of the major resources like time, energy and

money as fundamental factors steering the homemaker towards achievement of set goals.

Women have always been contributing their human resources such as time, energy, knowledge, attitudes, interest and skills/abilities in the household production of goods and services. Several factors affect the home managerial practices of the homemaker such as her age, education, employment, health status, family type, size and income, the occupation of the head of the family and the number and age of the children, location of the family within any community. Studies have proved that these factors affect the homemakers' use of time, energy and other resources (Ragunathan, 1978, Mann, 1984 and Swaminathan, 1988).

Water is the most crucial single resource for the survival of human life. Every effort will have to be made to improve the availability of drinking water in rural areas, it is necessary to devise and implement scientific methods for water harvesting, conservation and recycling. Potable water supply in the rural areas has to be given the highest priority.

Ray (1985) states the importance of conserving the resources as they are limited qualitatively and quantitatively but they can be used to the maximum by

substitution and alternating the use of the same. Thus the quality of life depends upon the proper management of home which involves the effective use of both human and material resources of the family. Manikar (1986) regards time, energy and money as the foremost resources that steer the homemaker towards her achievement of set goals.

According to Mann and Mann (1982) among the various material resources, money income of the family is the main material resource. With money other goods and services required by the family or an individual can be obtained. The money saved by the use of home-grown vegetables and other agricultural products will form part of the income of the family. The main objectives of money management are all-round development of the members of the family, enhancing their happiness and health by making the best use of the income of the family. To achieve these goals the housewife should prepare the family budget.

Gross et al. (1980) states that a budget to be a plan, mental or written, general or specific, indicates how and/or when to allocate available financial resources among various needs and wants.

Narang et al. (1992) feel that time is unique because it is available equally to all persons and the productivity

or effectiveness of a person is achieved by how well she manages this resource. In the past, the scarcity aspect of this resource was not felt and people used to spend it in their own way. In the recent years, with the advent of economic, technological and social developments, people have started recognizing its existence as a scarce resource.

Time is an important part of the total pattern of living. It is a golden resource which should be saved and properly utilized to get maximum within minimum time. The first duty of woman is "household care". Any input in the management of the household will directly benefit her. The daily/weekly time and activity patterns in all homes reflect the interests, work habits and personal needs of the family (DST, 1983).

Time is a very valuable resource in the modern era. It must be managed most efficiently to have maximum productivity without adversely affecting health as well as personal and social life of people. It has been widely reported that women in rural areas spend a considerable time in various farm operations, besides doing household activities and looking after cattle. Their responsibility is also gradually increasing with the employment of male members of the family in non-farming sectors. Hence, there is a need to find out ways and means of reducing the work

load of rural women in household activities to enable them to devote more time in productive activities and in the care of their own children and other family members (Bhati and Laharia, 1990).

According to Sheela and Katteppa (1995), Mann and Mann (1982) and Srivastava (1985), time is an important human resource. Time is highly limited resource, which can be neither saved nor detained. It cannot be bought with money. To achieve family goals, it is a must to manage the time available for the family. Time and energy are very closely related resources of the family. Each stage of family life has different demands on the time of the housewife. Housewife works for longer hours in the kitchen and on farm compared to her counterparts at home. The energy spent by them in performing these tasks is more than it is physically feasible, particularly in a below subsistence level of living.

Gross et al. (1980), Gandhi and Singh (1987) opine that time has unique characteristics which affect its management. It is the only resource having a recognised and unchangeable quantity, the same for each individual. It cannot be saved about, must be employed in an effective way (Barna, 1960 and Devadas, 1986).

Time may always pose as an ultimate constraint in the use of resources since it cannot be increased or accumulated. A homemaker spends 5-12 hours daily for homemaking activities whereas an employed homemaker could spend only 4 to 8 hrs (Ganger, 1973).

The words of Devadas (1986) are true that time management concerns not only the number of hours spent but how effectively these hours are spent. Carefully thought out time and activity plans are useful tools in saving time and energy and relieving the tension of decisions and uncertainities.

Tripathi and Arya (1988) found that a farm woman devotes the maximum time of her working hours in household activities/ food preparation, cleaning and child care. Under this, food preparation took the maximum working hours of the farm woman (ie., 3 hours 45 minutes per day).

Woman performs multiple jobs pertaining to domestic affairs which accounts for about ten to eleven hours of work in a day (Gupta and Singh, 1986; Munjal, 1984; Nandal et al., 1986 and Kashyap, 1988).

Kumari (1963), Saraswathi (1972) Adaviyappa (1976), Sandhu (1976) and George and Bafna (1983) had studied the time spent by homemakers on household work and found that

the homemakers spend the largest amount of time in preparing food, cleaning away and care of house. Time use was greatly influenced by the size of the family and the age of homemakers. Average time spent per day on various household activities by rural homemakers as revealed from their study is given in Table I :

TABLE I

AVERAGE TIME SPENT BY RURAL HOMEMAKERS

Different Activities	Time per day in hours	Percentage
Meal preparation	4.06	26.00
Fetching water	1.06	6.98
Cleaning of house	0.51	5.39
Care of children	0.47	0.74
Dish washing	0.42	4.44
Washing clothes	0.32	3.38
Personal care	1.03	6.66
Leisure time activities	4.24	27.91
Animal care	2.55	18.50
Total time spent on all household activities	15.46	

The findings by Bhatnagar and Saxena (1987), Singh et al. (1987), Kashyap (1988) Grover and Verma (1990) and Narang (1990) also endorsed the fact that cooking was the most time consuming activity for farm women.

Singh et al. (1987) also reported that cleaning of house took minimum time for doing household activities by rural women.

Saxena and Bhatnagar (1988) opine that among the various household chores, food preparation and cooking and even purchasing domestic provisions continue to be an exclusive responsibility of women, besides looking after children. The major categories of household activities which will require more energy and time expenditure on the part of the homemaker are food preparation, cleaning, washing, mopping floors, child care, personal clothing, construction and miscellaneous activities, which would take an average of 239 hours in a month.

Kaur et al. (1986) in their study had found that cooking consumed maximum time per day per family in Punjab.

Sharma and Dhillion (1984) had also reported that homemakers spend 206.4 minutes per day on food preparation.

Food preparation was maximum time consuming activity for both tribal and non-tribal women in Rajasthan (Saxena and Bhatnagar, 1985).

Jain and Verma (1992) report that women of Kurukshetra district were spending more time in household activities.

The time spent in cleaning activities like washing clothes, dishes, etc., was observed in different family size groups. As the size of family increased, the average time spent on washing of dishes and cleaning activities of house, etc., also increased. The women in large sized families spent maximum time on care of children followed by small sized families. It may be because of the presence of more number of small children in these families.

Ray (1985) says that energy in the process of home management means human energy, which deals with an individual's ability to do work. Fatigue is tiredness due to exertion. In the home management process, when the homemaker feels fatigued or tired, she is prevented from performing her duties efficiently. Patterns of fatigue depend upon individual's response to different works in different ways.

Gupta and Ogale (1992) highlight that household sector is one of the major energy consuming units accounting for more than 48 per cent of the total energy consumed in India. Fuel for cooking is important and basic for living since one has to cook to eat and one has to eat to live. Thus fuel energy is a crucial and sensitive requirement for the human survival and environment preservation.

Batliwala (1982) reports that women in poverty have low access to cooking fuel and spend the longest time for

obtaining it and its storage. The inefficient chulahs women use consume too much fuel and belch dangerous smoke. Collecting fodder and caring for animals are the other major activities of women.

Fuel is becoming a scarce commodity specially with the growing menace of deforestation. The rural women must be taught about the value of social forestry which would fetch fuel and fodder at low costs. They must be taught the value of hay box, the fireless cooker, use of solar energy for cooking as it is available free of cost all through the year, smokeless chulah which has good thermal efficiency, biogas which would facilitate the recycling of organic wastes available in plenty in the rural areas and briquettes made by compacting agro waste and by-products (DST, 1983).

Firewood has been identified as the conventional source of fuel meeting 87 per cent of the fuel requirement of an Indian home, the rest being taken up by kerosene, gas and electricity (Sooriamoorthy, 1989).

The homemakers spend long hours of their productive time in collection and storage of fuel wood and covering long distances with head loads of fuel woods back home causing fatigue.

Drudgery is faced by Indian girls and women because a huge majority of them spend a greater part of their day in the kitchen in front of the oven (Srivastava, 1984). Moreover, they spend endless hours to collect wood to be used for cooking food (Sumati and Mudambi, 1983).

The stove is an essential equipment of every house. One of the main disadvantages of a firewood stove is the smoke emission. Smoke blackens the vessels beyond cleaning, fills the kitchen and suffocates the person cooking, darkens the walls and roofs. Inhalation of smoke is one of the health hazards (Phadnis, 1983).

According to Prasad (1984) the cookstove can play a great role in reducing the drudgery of women folk who have to spend an increasing amount of time in collecting firewood, make the cooking more hygienic as well as save something for the household in terms of fuel consumption.

Improved, well-designed, fuel-efficient, low-cost and appropriate cookstoves have become the need of the day and are proving to be an indirect but effective short cut panacea for the accentuating the firewood crisis, deforestation and soil erosion. Its implementation would further solve the drudgery of rural women folk in collecting firewood, make cooking less time consuming and hygienic and conserve fuel

consumption (Hodo, 1983). Smokeless chulah is one such innovation which tries to drive away the smoke from the kitchen through a pipe (Phadnis, 1983).

Sharma (1987) opines that the chulahs introduced with the twin objective of increasing efficiency and reducing the emission of which the first is given wider publicity. Smith (1989) is of the opinion that both improved fuel utilization and reduced smoke exposures need to be considered as primary goals for stove design and dissemination programmes by adopting an efficient cooking system to eliminate smoke. It will be possible not only to solve the problems of health and housing, but also that of fuel and forest economy which are essential for the prosperity of the country.

Traditional chulahs which are very inefficient and have thermal efficiency which is in the range of 10-11 per cent, produce a lot of smoke and create polluted atmosphere (Sumati and Mudambi, 1983 and Dayal, 1983).

Open fire cooking is unhealthy especially to women who handle the cooking area exposed to the constant emission of smoke and soot. This results in choking up, unhygienic kitchen thus making the preparation unsanitary and forming layers of smoke due to burning of cowdung cakes and firewood (Prasad, 1982).

Prasad and Mandal (1983) indicate that the smoke emitted is a serious health hazard particularly for the housewives and children who are usually within doors and are exposed to the smoke most of the time.

Women's activities in the house revolve round the kitchen stove and the happiness of the family can be increased with improvement in the design of the stove so as to reduce the fuel intake and its nuisance of smoke, radiated heat and soot (DST, 1982).

Batish (1980) points out that 40 per cent of the cooking fuels can be saved by following simple tips at the household level. These are: reduce flame once boiling starts, keep water quantity to the minimum, use wide shallow vessels, avoid reheating food frequently, use pressure cooker for suitable items and soak grains and dhal prior to cooking.

The Hindu, survey of the environment 1995 estimated that "more than half the world's households cook daily with unprocessed solid fuels, i.e., biomass or coal". Evidence from around the world indicates that firewood, dung cakes and other fuels release highly toxic emissions such as carbonmonoxide, total suspended particles and hydrocarbons. Furthermore, these fuels are used primarily in traditional open cookstoves with a fuel efficiency of just three to ten

per cent, in poorly ventilated one or two-room homes. Even where ventilation is relatively good, the sheer magnitude of the emissions are such that they still seriously impair health.

Department of Family Resource Management (1991) gives different tips on household energy conservation. They are; before you light your stove keep everything ready, choose aluminium vessels, right size and shape, before cooking soak cereals and pulses, cook two to three items at a time in a pressure cooker, use fresh and enough water for cooking, reduce the flame when boiling starts and avoid reheating.

The dictionary meaning of fatigue is tiredness due to exertion. In the home management process when the homemaker feels fatigued or tired, she is prevented from performing her duties efficiently. Patterns of fatigue depend upon the individual's response to different works in different ways. There are two categories of fatigue. They are physiological and psychological fatigues.

The labour saving devices are of three classes. Some saves time, some saves energy and some saves both. The labour saving devices aid in doing the household tasks the easy way by reducing the time and energy expenditure (Devadas, 1985).

The use of suitable labour saving devices minimises greatly the strain in household work and increases leisure, saves time and prevents the onset of fatigue by saving energy (Devadas, 1985; Kurian and Raj, 1986).

Devendra Kumar (1989) opines that by the introduction of new labour saving devices, technology enters into the lives of people. All these are simple changes by which they bring new cheer to women by reducing their drudgery. The time saved by the use of these labour saving devices can be utilized for various development activities (Sinha, 1988).

According to Sharma (1990) and Vijayaraghavan (1985) household technologies which are currently being popularised are generally labour and energy saving devices such as biogas, solar cooker, smokeless chulah, mud storage device, hay box and purification of water for safe drinking water especially in rural areas.

Verma and Gupta (1980) state that waste water disposal from dwellings is one of the foremost problems in rural areas. Waste water is disposed of on roads and lanes causing environmental pollution, encouraging mosquito and fly breeding and thus endangering the health of the inhabitants. Therefore, a soakage system for underground disposal of the waste water near its source has been developed.

In the villages a small population has access to sanitation facilities. The maintenance and proper use of latrines are poor due to blockage and damage of the tap and lack of water facilities (Koren, 1974 and Chand, 1990). Villagers do not have even protected drinking water facilities, so they drink water from open wells, tanks and streams. Where there is a possibility of inflow of night soil and other pollutants, construction and use of latrines are not a felt-need of the people in the villages even though it is most essential for rural health (Centre of Science for Villages, 1980).

The environment consists of land, water, air and plants. Another external component of the environment is the perennial energy that it receives from the sun.

The adequate natural resources, if wisely managed, can fulfil the basic needs of every one now as well as of posterity. However, the need of the poor, the greed of the rich and the inappropriateness of the technologies employed in various sectors have resulted in a rapid erosion of our resource base, depletion of our forests, decimation of wild species, and pollution of air and water which threaten future development (Bahl, 1993).

Mathew (1991) and Mathur (1991) observe that the physical environment in which many Indians live is most injurious to their health conditions. Contaminated water supplies, unhealthy housing and sanitation and unhygienic disposal of human waste are among the principal causes of morbidity and mortality. Though all human and animal life is affected by the quality of water consumed, many diseases in India are due to water borne pathogens and microbial pollution.

Salim (1986) opines that in most developing countries, disease is very much connected with poor environment. For instance there is malaria where there is dirty standing water. Respiratory infection is also related to an insanitary environment.

The task of providing water and sanitation to the unserved population is so immense that it would be almost impossible to accomplish it without the development and application of low-cost technologies. Low-cost technologies are generally applied at the peripheral level, where construction, operation, maintenance and surveillance may vary greatly from one location to another, affected by the level of community motivation and participation (Bal et al., 1992).

There are numerous technologies related to health and sanitation, rural women need to imbibe. They should be exposed to hygienic ideas such as protected drinking water, use of handpumps, low cost earthern water filter and low cost latrines (DST, 1983).

A rural homemaker can make use of indigenous equipment and fuel saving devices such as smokeless chulah, hay box, mud storage device and so on to conserve her time and energy (Giriappa, 1986).

Homemakers' ignorance on the advantages of effective management of resources lead to managerial problems. Common managerial problems faced by homemakers are lack of time, lack of assistance and facilities and fatigue (Bhatnagar and Saxena, 1987).

Ramapaduka (1986) states that the labour saving devices have brought about changes in the use of time and energy for household activities.

According to Vasist and Dhesi (1976) one of the methods of achieving efficient management of time and energy is the use of labour saving devices. In the rural homes, the household work consumes a major part of homemaker's energy and time because of little use of labour saving devices.

Nayudamma (1977) and Sharma (1990) view that the new household technologies not only reduce the drudgery of work but also offer the respondents convenient means to do the work. Smokeless chulahs and biogas plants also offer the respondents environmental cleanliness. Women no longer have to perform cooking in an uncongenial environment. That it decreases the work load, increases the leisure time and reduces the drudgery of work. Thus the usefulness of the technology is to be judged by the contribution to social and economic development.

According to Narang, Jain and Laliyadav (1992) there are a number of appropriate technologies to relieve women from household drudgeries and also their important resources-time and energy. They are: smokeless chulah, pressure cooker, hay box; kitchen tools, proper kitchen arrangement, biogas, soak pit, sanitary latrine and kitchen gardening. The cooking devices used by majority of the rural households were primitive, smoky and unhygienic. The smoke emitted by these traditional chulahs is dangerous to health. They further add that women in three hours of cooking inhale more pollutants than the industrial workers do during eight hours of their work shift. The introduction of the smokeless chulah alone, will solve ten per cent of the health problems.

The smokeless chulah is a simple device that needs to be designed with perfect technical skill. It should drive away the smoke fully from the cooking place and at the same time provide the maximum thermal efficiency. The combination of these two essential requisites is a difficult task. Added to this is the problem of gaining social acceptance and making a smokeless chulah an integral part of rural housing (Kamalamma and Pushpa, 1987).

The heat efficiency of local cooking stoves is very low. In order to conserve fuel, it is necessary to use stoves with higher efficiency. This would help in reduction of fuel requirement of the house and thus saving in time and labour of the women.

Smokeless stoves relieve eye strain and headache due to smoke. Three vessels can be placed on them simultaneously. The heat can be controlled and smoke is regulated through a chimney provided at the other end of the oven right upto the roof of the kitchen. The chulah may be prepared to the required size. These chulahs have high boiling and evaporation efficiency (Bhaskaran and Neelakantan, 1993).

Bhaskaran and Neelakantan (1993) say that organic wastes including cattle dung and human excreta could make available huge amounts of energy to meet the farming

family's needs. This technology promises a considerable increment in the efficiency of energy conservation in the village since the traditional use of dung for fuel destroys its fertilizer value and vice versa. Through the use of biogas, the time and energy of the homemaker are conserved resulting in extra leisure hours for income generating activities. Biogas plants are becoming more and more popular in rural areas.

Biogas is the most convenient domestic fuel which is not only hygienic but will also help to improve the environmental condition in the rural areas. Biogas technology is well known to offer fuel, fertilizer and environmental sanitation (Sharma, 1980; and Reddy, 1981).

The hay box is a fireless cooker which can be effectively used by rural women. It saves LPG, Kerosene and fuel wood energy upto 20 per cent as no fuel is required in the hay box. The food remains hot for five to six hours. There are no chances of burning and boiling over by food. Rice, dhal and porridge can be cooked in it. Adoption of the hay box may be an important strategy to help in slowing down the depletion of energy resources (CAPART, 1988).

Narang, Jain and Laliyadav (1992) state that the hay box is a time and energy saving device used for cooking. The principle of heat conservation is by using suitable

insulation materials. The hay box cooking was less strenuous and more convenient since cooking needed no personal attention during the process and completion of cooking.

Hay box is one of the cheapest and appropriate devices for saving part of the fuel spent in cooking. The cheapest and commonly available material being hay, it is widely used and hence the name Hay box (Kamalamma and Pushpa, 1987).

A survey of hundred homemakers who had started using the hay box showed that 50 per cent of their cooking time was saved and 44 per cent of the fuel expenditure was also reduced (Devadas et al. 1988).

Solar cookers reduce fuel requirements, attention required for cooking can be minimized and the food cooked in solar cooker does not get spoiled quickly (Venkateswaran, 1979; Broda, 1980 and Rao, 1983).

A soak pit is a simple device for soaking and transferring waste water to the sub soil. It prevents stagnation of waste water around bath rooms, washing areas and kitchens and helps to keep the environment dry and clean (Bhaskaran and Neelakantan, 1993).

Soak pits or seepage pits are cheap to construct, need no media when lined or filled with brick bats. Soak pits

should be preferred only when land is limited or when a porous layer underlines an impervious layer at the top, which permits easier vertical downward flow than horizontal spreadout as in the case of dispersion trenches. Minimum horizontal dimensions of soak pit should be 1m, the depth below the inverted inlet pipe being at least 1m. The pit should be covered and the top raised above the adjacent ground to prevent damage by flooding (Bal et al., 1992).

Today the kitchen garden is an important part of every garden. The rising cost of vegetables has encouraged many gardening enthusiasts to devote a part of their garden to growing vegetables. Kitchen garden products are not only a welcome addition to the table, but kitchen gardening also provides healthful recreation in the open air. Waste water can become a valuable source of water supply for house garden. Waste water utilization in the household can be established for the production of vegetables. Recent studies conducted by Gnanambigai (1988) and Vidya (1992) revealed the possibility of growing vegetables utilizing waste water.

One feasible technology for overcoming the drinking water crisis is rain water harvesting from roof tops of the individual's houses and community buildings. Since annual rainfall is the sole resource of fresh water supply which also varies from year to year, it is of utmost importance

that this water is collected, conserved and consumed most appropriately and economically over a longer period of time.

The mud storage device is used to store vegetables, fruits, milk and cooked foodstuff to keep them fresh for about a week. There are two pots-one inside the other. The inner pot serves as a container for vegetables, cooked food, milk and other items of food. The outer pot serves as a reservoir from which water evaporates through its pores. Continuous water evaporation produces a cooling effect and the water in turn cools the inner pot. A difference of 11 degree C temperature has been noted between the inner and the outer temperatures. Water is filled through an opening which is on the upperside of outer pot. A common lid is provided for both the pots. The lid has perforations on the sides which allow the vapours to escape from the stored material (DST, 1982 and 1990).

Water filter candles which, filled to domestic water containers, including earthen pitchers, can meet the daily requirements of an average family. These candles provide bacteria-free water. Raw water contains harmful bacteria have to be removed to make it potable through water filter (DST, 1990).

D. Conservation of Household Resources Through Education

Kumar and Singh (1992) say that man is the social animal on this planet, who can be polished and furbished for new competencies to attain the desired results. The human beings, who are inhabiting the urban areas, have a requisite level of knowledge and awareness, but their rural counterparts have not much knowledge and awareness about their immediate environment and also the modern technological development. To manage resources in rural areas, it is basic and pre-requisite to the success that the local inhabitants must be involved in the policy making and in implementation process, which need: a reasonable level of literacy. Thus, education is one of the main ingredients for developing and managing human resources in these areas. Education will culminate in the skills, knowledge, competencies, readily accessible and perception about the technological developments in the rural inhabitants.

Kapoor (1986) found that the realization of the country's aspirations involves changes in the knowledge, skills, interests and values of the people as a whole. This is basic to every programme of social and economic betterment of which India stands in need. For India to make progress, its millions of women have to be educated fast - with or without literacy.

Awareness is essential for action. Education can make man aware, conscious of and knowledgeable about low cost technologies. Education can help man to understand the underlying causes and manifestations and impact of these problems, so that man may act in a concerted manner not only to alleviate and solve the existing problems but also to prevent their recurrence (Padhan, 1994).

In the views of Jawaharlal Nehru, "It is important to inculcate a scientific temper among masses not merely for improving their performance as economic agents but it is important to change their mental make-up as such". The relevant education for rural areas will be the appropriate rural technology suitable to rural resources, needs and general set up. Education with appropriate rural technology is a must in the process of transforming the stagnating rural economy into an innovative self-generating one. This type of education helps to innovate and propagate technology which in turn helps the community to solve the problems (Kapoor, 1986).

E. Related Research Studies

Sharma (1990) conducted a study to assess the benefits of modern household technologies to rural women. The study was carried out in a cluster of villages of agriculturally advanced Karnal District, namely, Samalkha, Paoti, Jaurosi, Bhapre and Dhikadla. The study was limited to 200 rural

homemakers. The study was descriptive in nature with structured interview schedule as data collecting tool. It was found that the tasks which were earlier tiring and tedious were no longer so, as the new household technologies not only reduced the drudgery of work but also offered the respondents convenient means to do the work and those who had accepted household technologies, their quality of life had definitely improved.

Indravati et al. (1992) carried out a study on "drudgery reduction of rural women in household activities" in two villages of Hisar district, namely, Ladwa and Rawalwas Khurd. A sample of 50 respondents (25 from each village) was selected irrespective of land holding size. The technological package whose introduction and adoption was studied comprised of smokeless chulah, pressure cooker and electric milk churner. It was found that on the basis of maximum time and energy consumption and extent of drudgery involved, main activities, namely, cooking and milk churning, were identified. In order to lessen the drudgery and save time and energy of these activities, improved household technologies, viz., smokeless chulah, pressure cooker and electric milk churner were introduced among the selected sample through an action programme. The introduction of improved household technologies played a significant role in reducing the burden of the rural women.

The time and energy conserved by the rural women through introduction of these technologies were effectively used for personal care, child care and in carrying out other income generating activities which improved their quality of life.

A study was conducted by Tripathi and Arya (1993) on time utilization pattern of farm women in relation to size of family on 77 randomly selected hquseholds in two purposely selected villages of Bareilly District, namely, Kalapur and Mudia Ahmednagar. It was found that food preparation was the one activity on which largest working time was devoted by women of all family sizes, but in medium sized families they comparatively spent more time on food preparation. The time spent on cleaning activities i.e., washing clothes, dishes, etc., was observed to vary in different family size groups. As the size of family increased, the average time spent on washing of dish and cleaning activities of house, etc., also increased. The women in large sized families spent maximum time on care of children followed by small sized families. It may be because of the presence of more number of small children in these families. The rural homemakers believed that when children were small, they required more time to look after them. It was evident from the study that women had to devote more time on domestic activities in large families.

The project carried out by Kalra and Singh (1990) with regard to the smokeless chulah at Palampur, in Himachal Pradesh, revealed that majority of the respondents 57 per cent from project group had a high knowledge score about the improved practices of the Dhauladhar Chulah as compared to only three per cent of the respondents in control group. A large majority of the respondents (88 per cent) from the control group belonged to the low knowledge category as compared to a small percentage of respondents (8 per cent) from project group. Thus it could be concluded that majority of the respondents from project group were in high and medium knowledge category. On the other hand, in the control group a large majority of the respondents belonged to the low knowledge category and 27.33 per cent of the respondents from the project group were high adopters. It was found that respondents from the project group had significantly high knowledge and adoption with respect to Dhauladhar Chulah as compared to control group.

Krishnaveni (1990) conducted a study on 'Assessing and Improving the quality of life of selected rural families' with 100 households in the villages Vadamadurai and Idayarpalayam in Coimbatore District. Community-oriented Action Programmes were also conducted in the selected villages to improve their level of living. The findings showed that 48 per cent the homemakers had pointed out that the use of the hay box helped them to minimise the consumption

of fuel and cooking time and did not require to strain the excess of water during cooking (32 per cent).

Venmathi (1994) conducted a study on "Creating awareness on environmental hygiene among women and children" in Kovanur, Mathampalayam, Palanigoundenputhur, Naickenpalayam and Saravanampatti of Coimbatore District on a sample of 525 women from the rural households and 200 women from urban slums. The interview schedule was used to collect the data. The findings of the study were that after realizing the benefits of having a smokeless chulah, 113 rural women had installed smokeless chulahs in their houses with the assistance received from the Block Development Office. The feed back indicated that 98 per cent of women were happy with the smoke-free kitchen which helped them to have hygienic and pleasant environment. As an outcome of the educational programme, 28 families spread in five villages had installed biogas plants. All the families had reported that the biogas plant supplied smoke-free and clean fuel, maintained the kitchen clean, improved the health of the women and created a hygienic atmosphere in and around the house.

The study further revealed that for disposal of the human excreta, even with continuous efforts, only 18 households had constructed sanitary latrines. Twelve families had constructed soak pits near the drain outlet of

their houses to combat the problem of disposing sullage water.

Mathew (1994) had conducted a study on improving the managerial practices of employed and full time homemakers with special reference to time and energy in two villages of Thrissur district in Kerala state, namely, Kathlapooram and Cheroor with 500 homemakers (200 employed and 300 full-time). The educational programme comprised of a series of lectures, exhibition on topics related to management of resources and work simplification, demonstration of low cost labour saving devices and distribution of booklets prepared specifically to help homemakers improve their knowledge on conservation of resources. Twenty five employed homemakers and 50 full-time homemakers were selected, based on the interest shown for adoption of low cost labour saving devices and economic activities respectively. In terms of application of knowledge gained through the education programme, assessed at the end of one month and one year, about 15-30 per cent increase was observed in the use of labour saving devices while 10 per cent increase was noted in using time plan, making decisions, using correct posture, adopting methods to reduce fuel cost and allocating the tasks effectively. All the homemakers using hay box had expressed full satisfaction with regard to its ability to save time, energy and fuel in cooking.

Procedure

III. PROCEDURE

The study on the "Impact of Education on Conservation of Household Resources by Rural Families" was designed to find out the existing living conditions of the rural families, the low cost technologies used by them in the household activities and to persuade the homemakers to adopt low cost labour saving technologies to reduce their drudgeries in order to conserve time, money and fuel and thus improving their quality of life. The procedure adopted for the study is presented under the following heads:

A. Household Survey to find out the Existing Living Conditions and the Low Cost Technologies used by the Homemakers

B. Conducting an Action Programme for Imparting Education on Low Cost Technologies for the Conservation of Resources and

C. Evaluating the Impact of the Action Programme.

A. Household Survey

According to Gupta (1988), a survey is a process of collecting data from the existing population units with no particular control over factors that may affect the population characteristics of interest in the study.

The aspects included under this were:

1. Selection of the area
2. Selection of the sample
3. Selection of the method and the tool for the study
4. Preparation of the schedule
5. Pretesting and finalising the interview schedule
6. Conduct of the interview and
7. Consolidation and analysis of the data.

1. Selection of the area

Three villages namely, Kovanur, Palanigoundenputhur and Mathampalayam belonging to Periyanaickenpalayam Panchayat Union in Coimbatore District, Tamil Nadu were selected for the study. Figure 1 (map) shows the selected areas for the conduct of the study. These areas were chosen owing to their easy accessibility and the co-operation extended by the people and the authorities concerned.

2. Selection of sample

The number of households in each of the three villages were obtained from the village panchayats. There were 565 households in Kovanur, 590 households in Palanigoundenputhur and 645 households in Mathampalayam. Three hundred homemakers at the rate of 100 from each of the three villages were selected for the study to gather the necessary information using simple random sampling method.

SELECTION OF THE AREA

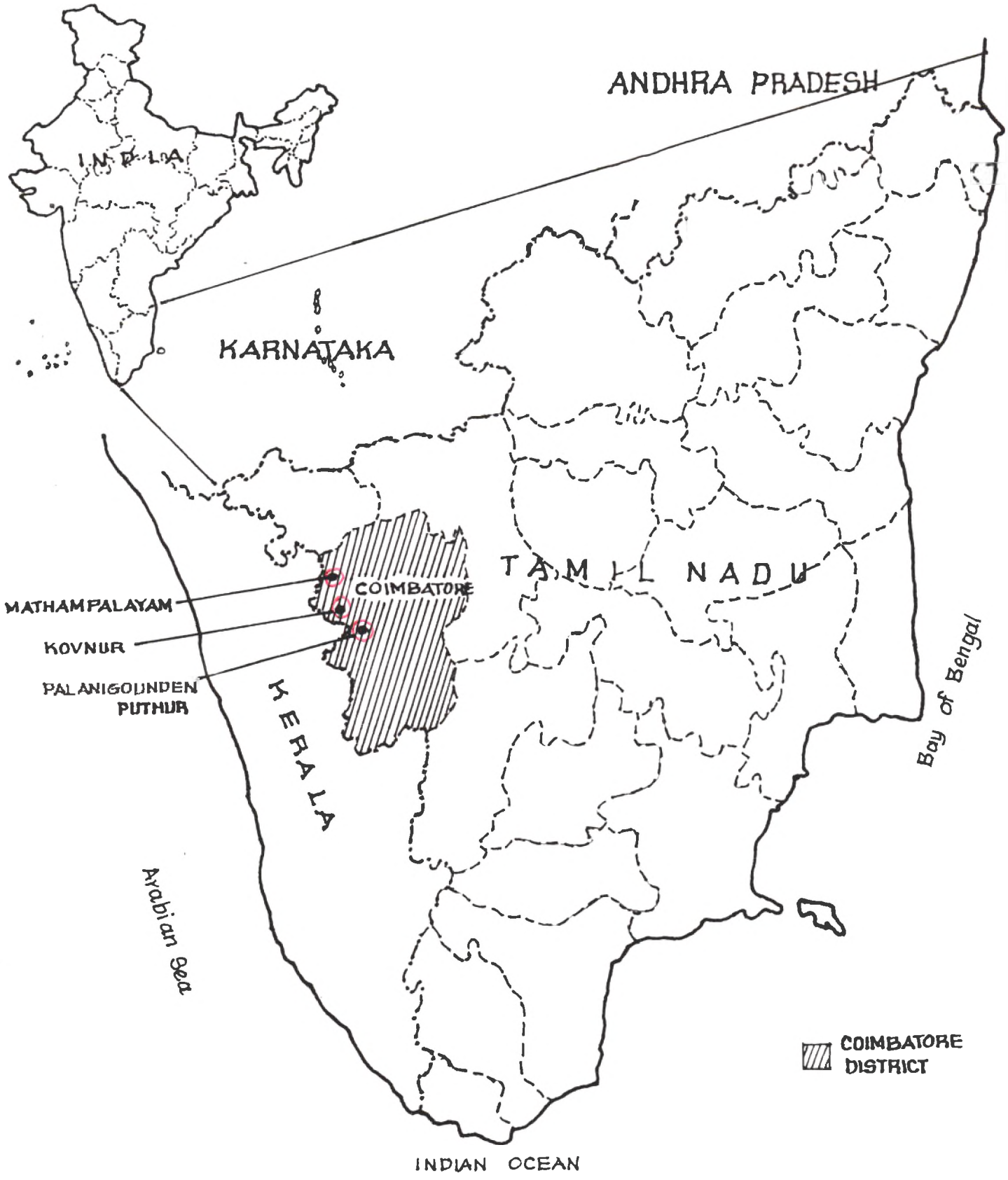

Figure-1

Random sampling is that in which every item of the universe has an equal chance of being selected (Palaniswamy and Manoharan, 1991 and Gupta, 1991).

The homemaker is the key person in the household with regard to the household activities. She is the planner, controller and the ultimate user of a majority of the resources in the home. Hence homemakers were identified as the target group.

3. Selection of method and tool for the study

The method of study used was survey and action programme.

According to Young (1984) in general we may observe that social surveys are concerned with

a) the formulation of a constructive programme of social reform
b) amelioration of current or immediate condition of special pathological nature, which have definite special implications and significance and
c) these conditions can be measured and compared with situation which can be accepted as model.

The survey method was taken up by the investigator to study in depth the different practices with regard to household activities among the homemakers which can help the

investigator to formulate the programme of action to conserve the resources among the rural homemakers.

The tool which was selected for the study was an interview schedule as most of rural homemakers were illiterates.

An interview schedule refers to a set of statements and questions to be answered by the respondent in a face-to-face interview and filled in by the interviewer (Chaudhari, 1989).

According to Shukla and Gulshan (1983), the personal interview method is the method in which data are collected by the investigator personally by asking questions pertaining to the enquiry from persons from whom the information is to be obtained. The advantage of this method is as the investigator is present on the spot for conducting the enquiry, the data collected would be first hand and accurate.

An interview schedule was used to collect information about the family background, existing living conditions and the low cost technologies used by the rural homemakers.

4. Preparation of the interview schedule

An interview schedule was evolved to elicit information from the rural homemakers with regard to their family background, existing living conditions and the low cost technologies used by them.

5. Pretesting and finalising the interview schedule

It is always worthwhile to get the schedule pretested before the interview schedule is finalised. The pretesting instrument provides a means for solving unforeseen problems in its administration and also indicates the need for additional questions or deletion of others (Bhandarkar, 1992).

Hartmann et al. (1989) affirm that the schedule should be standardised for clarity and validity before taken to the field for survey through a pilot study. As defined by Waston and Hill (1991), a pilot study is a preliminary testing, in which the researcher seeks to try out a new idea, system or approach to determine whether an intended study is feasible, to clarify assumptions and improve instruments of measurement.

A sample of 25 households from the relevant universe was picked up and the interview schedule was tested on them to find out the drawbacks of the schedule, that is, which questions ought to be deleted and which more ought to be added or modified.

Based on the responses of the pilot study, the schedule was modified and finalised (Appendix I).

6. Conduct of the interview

Before conducting the interview, the investigator approached the selected homemakers individually and established good rapport with them through friendly conversation. The investigator met all the homemakers personally and after explaining the purpose of the study, interviewed them with the help of the specially evolved interview schedule and marked the responses given by them in the schedule then and there. Likewise 300 homemakers were interviewed and their responses were recorded accurately.

7. Consolidation and analysis of the data

After the data had been collected, it is essential to put the unorganised information in a systematic manner in order to obtain the desired results and their interpretation scientifically (Sadhu and Singh, 1985).

The data thus collected were consolidated, tabulated, analysed and discussed in an orderly manner.

B. Conducting Action Programme

The survey brought to light the existing pattern of carrying out the different activities with regard to the household maintenance by the rural homemakers.

Use of mass media for motivating people to take specific action is far more difficult than information

transfer or agenda setting. Creation of awareness about an issue is obviously not enough to generate the motivation to act. It is only after a process of internal analysis that a person will get motivated to do something. This role of stimulating and catalysing an analysis of the situation, of the new information provided was best done through inter-personal communication. These require regular use and therefore continuous and on-going motivation.

Based on the findings of the survey, the investigator chalked out a detailed plan of action for imparting education on the use of different low cost technologies and appliances like Smokeless chulah, Biogas, Hay box, Mud storage devices and Mud water filter, which if practised in their household activities would conserve the resources in terms of time, fuel, energy and money.

The plan of action consisted of teaching about the appliances to the rural homemakers as to how to use smokeless chulah, hay box, biogas, mud storage devices, water purification, soak pit, sanitary latrine and kitchen gardening, etc. The period for imparting education was finalised and syllabus was formulated by the investigator in consultation with a panel of experts for each of the items to be taught and lesson plans were prepared (Appendix II).

In consultation with the homemakers, it was decided to conduct two classes every week at the local school/community hall/leader's house, where the homemakers gathered. Taking into consideration the background and specific needs of the homemakers, the action programme was simplified and emphasised certain aspects of its content. The methods used for imparting education were lectures with audio visual aids, demonstrations and discussions. Thus classes were conducted at the three villages, namely, Kovanur, Mathampalayam and Palanigoundenputhur and in each village 100 homemakers were selected for this purpose.

The education programme included technical aspects about the new technologies and the appliances and motivational aspect for persuading them through conviction to adopt in their household activities.

During discussions after lectures and demonstrations, many relevant questions were raised by the homemakers which were clarified by the investigator then and there to the satisfaction of the homemakers. It took six months to complete the teaching of the low cost technologies and appliances to the rural homemakers of the three villages. Pamphlets and leaflets were prepared in local language and were distributed during discussion (Appendices IIIa, IIIb and IIIc) and (Plate I).

Individual contact

Group Discussion

Demonstration

Exhibition

Plate 1. CONDUCTING ACTION PROGRAMME

Explanation of Water filter

Lecture

Distribution of pamphlets

Distribution of samplings

C. Evaluating the Impact of the Action Programme

Evaluation is a word which is very commonly used and which indicates assessment or appraisal of something. This term was used more in the sense of examining or scrutinising some activity and giving judgement about its success or failure.

In order to study the impact of the action programme conducted by the investigator in three selected villages, namely, Kovanur, Mathampalayam and Palanigoundenputhur, an evaluation schedule was prepared to elicit information and to recollect their thoughts towards various aspects of the household technologies imparted during the action programme.

The impact of the action programme on the homemakers was assessed after a period of six months. Evaluation was concerned with the ability to judge the value of material for a given purpose. The judgements were to be based on definite criteria. Learning outcomes in this area were highest in the cognitive hierarchy because they contained elements of all of the other categories plus value judgements based on clearly defined criteria.

All the homemakers of the three villages to whom the education on the low cost technologies was imparted were interviewed with the help of the evaluation schedule to find out the level of knowledge they had acquired and their opinion about the technologies.

Appendices IV and V present the schedules used to find out the knowledge gained through action programme and their opinion regarding these technologies.

The knowledge and opinion tests developed for this study are explained below:

The importance of studying knowledge (K), attitude or opinion (A) and practice (P) stems from the fact that human factors such as knowledge, attitude or opinion and practice which induce improvement of abilities, skills, perceptions, values and actions have a bearing on the orientation of people towards development programmes and the adoption of innovations and suggested new practices. Knowledge of the programme and a favourable attitude or opinion towards it would influence the acceptance and sustenance of programmes. Hence, change in KAP has become a desirable goal in the development of rural societies (IGNOU, 1991).

Knowledge is acquired in different ways. Knowledge can be either theoretical or practical. In the case of theoretical knowledge, a person improves his/her intellectual capacity through studying, thinking and exercising his/her mind by abstract reasoning and constructs. Knowledge derived from actual experience is referred to as practical.

The interview is probably the most useful technique which can be used to assess people's knowledge. The most widely used method of ascertaining knowledge through interview schedule which consists of a set of questions filled by the interviewer in a face-to-face situation with the respondent was followed.

Opinion is usually defined as a mental state of readiness or a predisposition which is learned or formed through experience exerting a direct or dynamic influence upon the individual's response to objects, persons, institutions and events either favourably or unfavourably. An opinion has three components. The first is the behavioural or conative component which relates to a person's predisposition or action tendency. The second component of opinion is the cognitive component. It implies the beliefs regarding the object of attitude. Beliefs may be based on factual reasoning, rationalisations or vague ideas or a mixture of them. The third component is the affective or emotional component. It concerns with the extent to which a person likes or dislikes the object of an attitude.

These three components are interrelated and can be said to form a coherent set. Thus a person who likes an object and has positive feelings towards it is also likely to act positively in that direction. However, there can be

situations where the behaviour may not be consistent with the first two components as people can be ambivalent and a number of internal/external factors can influence behaviour. The weightage of the components varies from one situation to another.

Change from an unfavourable or neutral opinion to a favourable opinion is desirable as it becomes a pre-requisite for adoption of a new idea or technique.

Effectiveness of the technologies imparted to the homemakers was also evaluated through a check list (Appendix VI)

The data thus collected were consolidated, tabulated and analysed using percentages and other statistical treatment and described in detail in Chapter IV.

Results and Discussion

IV. RESULTS AND DISCUSSION

The findings of the study on "Impact of Education on Conservation of Household Resources by Rural Families" are analysed and presented under the following headings:

A. Personal Profile of the Sample

B. Existing Practice of the Households and

C. Impact of the Action Programme

A. Personal Profile of the Sample

The details of the personal profile are discussed under the following aspects:

1. Age,
2. Education,
3. Type and size of the family,
4. Occupational status,
5. Family income
6. Housing pattern,
7. Land holding and
8. Possession of cattle.

1. Age

Table II presents information on the age of the selected homemakers.

TABLE II

AGE RANGE OF THE SELECTED HOMEMAKERS

S.No.	Age in years	Percentage (N=300)
1.	20-25	15
2.	26-35	25
3.	36-45	45
4.	46-55	15

Above table shows that the age range of 300 homemakers taken for the study was from 20 to 55 years. Of the 300 homemakers, 45 per cent belonged to the middle age group (36-45) and 15 per cent belonged to the age group of 20-25 years and 46-55 years each. The average age of the sample was 38 years.

2. Educational status of the homemakers

The education level of family members helps to develop better citizens of the nation and is an important instrument which improves the quality of living in all walks of life. Education widens the mental horizon, it also shatters the oppressive ideological, mythological, dogmatic and orthodox shackles (Singh, 1988).

The educational level of the selected homemakers is presented in Table III.

TABLE III

EDUCATIONAL LEVEL OF THE HOMEMAKERS

S.No.	Educational level	Percentage (N=300)
1.	Illiterate	42
2.	Primary	24
3.	Secondary	13
4.	Higher Secondary	14
5.	Graduate	4
6.	Professional	3
7.	Technical	-

It is evident from the above table that 42 per cent of homemakers were illiterates, 13 per cent of the homemakers had studied upto secondary level. Professional qualification was found only among a meagre 3 per cent among the homemakers taken for the study. None of the homemakers taken for the study had technical education.

3. Type and size of the families

Table IV indicates the type and size of the selected families.

TABLE IV

TYPE AND SIZE OF THE FAMILIES

S.No.	Type and size	Percentage (N=300)
Type of family		
	Nuclear family	77
	Joint family	23
Family size		
	Small (1-3 members)	30
	Medium (4-6 members)	60
	Large (7 and above members)	10

Data regarding the type of family show that a majority (77 per cent) of the sample taken for the study belonged to nuclear family and only 23 per cent were living in joint families.

According to Bhoile (1987) families having seven to nine members have been termed as large family, the family with four to six members as medium, less than four members are referred to as small family.

It is encouraging to note from the above table that over 60 per cent of the families surveyed belonged to medium size (4 to 6 members) followed by small (1 to 3 members) (30 per cent) and there were 10 per cent large (7 and above

members) families. The average size of the family of the selected sample was 4.10. This trend reflects the fact that the homemakers had realised that a small family was more conducive to happy living.

4. Occupation of the homemakers

The occupational status of the families reflects their economic position and standard of living. It is, therefore, important to study the occupational trends of the homemakers.

Table V depicts the occupation of the homemakers.

TABLE V

OCCUPATION OF THE HOMEMAKERS

S. No.	Occupation	Percentage (N=300)
1.	Coolie	18
2.	Agriculturist	10
3.	Industrial workers	4
4.	Business tea and maligai shop	5
5.	Others like tailors and dhobi	4
6.	Unemployed	59

Among the 300 homemakers selected for the study, a majority of 59 per cent were unemployed housewives while 18

per cent were working as coolies, 10 per cent of the homemakers were agriculturists and four per cent were working in industries. This shows the low level of occupational pattern prevailing among the rural people.

5. **Family income**

Table VI gives the monthly income of the selected families.

TABLE VI

MONTHLY INCOME OF THE FAMILIES

S.No.	Income Range (in Rs.)	Percentage (N=300)
1.	Below 2500	64
2.	2501 - 5000	23
3.	5001 and above	13

Majority of 64 per cent belonged to the monthly income group of Rs. 2500 and below, while 23 and 13 per cent were in the income ranges of Rs. 2501-5000, above Rs. 5001 income groups respectively. None of the families were engaged in income generation programmes though they had evinced keen interest in knowing more about them. The average monthly income of the selected families was Rs. 2389.

6. Housing pattern

Individual houses were preferred and owned by majority (65 per cent) of the families. Owning a house was a status symbol as living in one's own house enhanced one's prestige. It also facilitated the people to raise kitchen garden, maintain poultry and dry their grains in the vacant land of their houses.

It was observed that 60 per cent of the households possessed tiled houses, whereas 24 per cent had terraced buildings, while 16 per cent lived in thatched huts.

7. Land holdings

Out of 300 families selected for the study, only 177 families had owned lands and the size of land owned by them is given in Table VII.

TABLE VII

LAND HOLDINGS OF THE FAMILIES

S.No.	Land size (Acres)	Percentage (N=177)
1.	0.5 - 2.5	63.3
2.	2.6 - 5	12.9
3.	5.1 - 7.5	12.4
4.	7.6 and above	11.4

It is clear from the table that 63.3 per cent of the 177 land owners possessed land in the range of 0.5 to 2.5 acres, 12.9 per cent of families owned 2.6 to 5 acres of land and 11.4 per cent of the families owned above 7.6 acres of land. The average land holdings of the families was 2.43 acres.

8. **Possession of cattle**

Only 40 households out of 300 selected for the study [illegible] cattle.

Table VIII presents the number of cattle possessed by the 40 families.

TABLE VIII

POSSESSION OF CATTLE

S.No.	Number of cattle	Number of households (N=40)
1.	3 - 5	21
2.	6 - 8	13
3.	Above 8	6

It can be seen from the table that 21 families had possessed 3 - 5 cattles, whereas only 6 families possessed 8 and above number of cattle.. The average number of cattles possessed by the families was 5.

B. Existing Practice of the Households

Existing practice of the households deals with the following aspects.

1. Fuel management,
2. Problem faced in the waste water disposal,
3. Toilet facilities,
4. Information regarding fatigue and
5. Labour saving devices used in the households.

1. Fuel management

Details regarding fuel management includes the following aspects:

a. Type of fuel used,
b. Person responsible for procurement of fuel,
c. Method of storing and
d. Problems faced with traditional chulah.

a. Type of fuel used

Table IX presents the type of fuel used by the families.

TABLE IX

TYPE OF FUEL USED BY THE FAMILIES

S.No.	Type of fuel	Percentage* (N=300)
1.	Firewood	100
2.	Dried palm leaf	68
3.	Twigs and barks	42
4.	Agro waste	35
5.	Saw dust	12
6.	Paper waste	10

* Multiple responses

The major fuel used in the rural area as expressed by the sample taken for the study was firewood (100 per cent) followed by dried palm leaves (68 per cent). Saw dust and paper waste were the other fuels used by less than 15 per cent of the families.

b. Person responsible for procurement of fuel

In a majority of 52 per cent of families, homemakers themselves were responsible for the procurement of fuel as against 34 per cent where the heads of families took the responsibility. Forty per cent had reported that both the husband and wife took the responsibility of collecting fuel.

c. Method of storing

All the families surveyed in the villages had indicated that they were storing the firewood just outside their houses. None of them had adequate space facilities for storage of fuel inside their houses.

d. Problems faced with traditional chulah

The selected homemakers had expressed the hardships faced by them while using the traditional chulah. The problems faced by them are presented in Table X.

TABLE X

PROBLEMS FACED WITH TRADITIONAL CHULAH

S.No.	Hardships	Percentage* (N=300)
1.	Soot deposition on the utensils	82
2.	Smoky kitchen	81
3.	Excess fuel consumption	74
4.	Takes more time for cooking	72
5.	Burning sensation of eyes	71
6.	Spoils the clothing of the homemakers	68
7.	Spoils health condition of homemakers	65
8.	Heat not adequately supplied to the first seat	60
9.	Drives away the children outside due to smoke	49
10.	Slow warming up	44
11.	Not durable	39

* Multiple responses

It is evident from the table that 82 per cent had said that soot deposition on the utensils followed by 81 per cent smoky kitchen were the hardships faced by them while using traditional chulah, 49 per cent had said that smoke drove away the children outside, 44 per cent had felt that the traditional chulah took much time for slow warming up and 39 per cent were of the view that the durability of the chulah was poor.

2. Problems faced in the waste water disposal

There was no proper drainage in the houses of the homemakers taken for the study in the rural areas. The major problems faced by them with regard to waste water disposal were : foul odour (89 per cent) from the stagnated waste water around their houses, breeding of mosquitoes (89 per cent), non-availability of common sewer (29 per cent) and no place for raising kitchen garden (32 per cent) for diverting the waste water and difficulty in disposing off large quantity of waste water.

3. Toilet facilities available in the village

In rural areas most of the people were using open field for defecation and there were no latrines in the individual houses of the 300 households taken for the study and the public latrines and conveniences were filthy without proper upkeep and maintenance.

a. Common toilet

Forty per cent of the rural homemakers were not using the common toilets and only 29 per cent were using common toilets available in the village.

All those who were not using the common public toilet facilities had said that there was no proper water supply in the toilets. The condition of the latrines were also very poor and dirty as they were not cleaned regularly.

The ugly sight and nasty smell emanating from the latrines which were very common in rural areas prevented the people from using it.

b. Open field defecation

Fifty two per cent of the selected sample were utilizing open field for nature's call. It was found out that the members who were not having toilets in their houses were using the open space nearby their houses for defecation in all three villages, while children used the immediate surroundings for defecation.

Table XI reflects the problems faced in open field defecation as given by the respondents.

TABLE XI

PROBLEMS FACED WHILE USING OPEN FIELD DEFECATION

S.No.	Problems	Percentage* (N=300)
1.	Unhygienic surroundings	32
2.	Cannot use during day time	29
3.	Emanates bad and nasty smell	29
4.	Cannot go out during rainy seasons	28
5.	Long distance	28
6.	Lack of privacy	18

* Multiple responses

It is clear from the above table that 32 per cent of the sample who were defecating in the open field had stated that the unhygienic surrounding was the problem faced by them, 29 per cent had said that they could not go during day time and emanates bad and nasty smell as major problems, 28 per cent each had mentioned as long distance and cannot go out during the rainy season and 18 per cent had said lack of privacy.

This shows that the surrounding areas of the house were used for defecation which created unhygienic surroundings, 26 per cent of them had pointed out that during illness, it

was difficult to go to the field often. The people especially women could go out only either early in the morning before sunrise or after sunset.

4. Information regarding fatigue

This aspect has been discussed under the following headings:

a. Fatigue causing activities,

b. Feeling of fatigue,

c. Reasons for fatigue and

d. Symptoms of fatigue.

a. Fatigue causing activities

Out of 300 samples surveyed, 63 homemakers had expressed that they had never felt fatigued. The remaining 237 homemakers had listed the different household activities which caused fatigue.

Table XII gives the fatigue causing household activities experienced by the homemakers.

TABLE XII

FATIGUE CAUSING ACTIVITIES FOR HOMEMAKERS

S.No.	Activities	Percentage* (N=237)
1.	Collecting fuel	61
2.	Collecting water	59
3.	Washing clothes	49
4.	Cleaning utensils	41
5.	Pounding grain	37
6.	Marketing	37
7.	Mopping	36
8.	Grinding masala	31
9.	Preparing food	26
10.	Sweeping	24
11.	Smearing cow dung on the floor	15
12.	Caring the child	10

* Multiple responses

From the above table, it is clear that a majority (61 per cent) of the homemakers had expressed that collecting fuel was more fatigue causing and 59 per cent had stated collecting water. Only 15 per cent and ten per cent smearing cow dung on the floor and child care respectively were considered least fatigue causing activities.

b. Feeling of fatigue

The 237 homemakers who used to feel fatigue had given the period of the day when they normally got fatigue are presented in Table XIII.

TABLE XIII

PERIOD OF THE DAY WHEN THEY NORMALLY GOT FATIGUE

S.No.	Period	Percentage (N=237)
1.	After heavy work	57
2.	After working continuously for two to three hours	43

Table XIII reveals that 57 per cent had complained fatigue after the daily heavy work in the home. Forty three per cent had mentioned that they felt fatigue when they work continuously for two to three hours at a stretch.

c. Reasons for fatigue

The reasons for fatigue as expressed by the 237 homemakers are given in Table XIV.

TABLE XIV

REASONS FOR FATIGUE

S.No.	Reasons	Percentage* (N=237)
1.	Working continuously without diversion or recreation	42
2.	Performing under emotional stress	40
3.	Working amidst many activities	39
4.	Difficult to perform	32
5.	A routine monotonous job	27
6.	Less interesting work	10
7.	Doing things hurriedly	10

* Multiple responses

From the table, it could been seen that 42 per cent of homemakers had felt fatigue due to "doing tasks continuously without diversion or recreation", 40 per cent due to "Performing under emotional stress", 39 per cent due to "doing amidst many activities", while ten per cent had given the reason for fatigue as "less interesting work" and another ten per cent "doing things hurriedly".

d. Symptoms of fatigue

The symptoms of fatigue experienced by the homemakers are picturised in Table XV.

TABLE XV

SYMPTOMS OF FATIGUE

S.No.	Symptoms	Percentage* (N=237)
1.	**Physiological fatigue**	
	1. Back ache	41
	2. Headache	39
	3. Neck pain	29
	4. Giddiness	28
	5. Palpitation	20
	6. Pain in the limbs	4
2.	**Psychological fatigue**	
	1. Boredom	31
	2. Frustration	24
	3. Depression	22
	4. Exhaustion	18

* Multiple responses

It is clear from the table that 41 per cent of homemakers had expressed back ache as the main symptom of physiological fatigue, whereas 39 per cent had said headache as the symptom. This is followed by other symptoms such as neck pain (29 per cent), giddiness (28 per cent) and palpitation (20 per cent).

Homemakers had expressed pain in the body (back ache and head ache) after performing the household activities because of long distance traversed by them for marketing and fetching and carrying water and fuel.

The symptoms of psychological fatigue were : boredom 31 per cent, frustration 24 per cent, depression 22 per cent and feeling of exhaustion 18 per cent.

Homemakers had felt that these feelings (frustration, depression and exhaustion) were experienced due to lack of rest (78 per cent), lack of leisure (72 per cent), and no recreation (79 per cent); poverty (68 per cent), lack of facilities (64 per cent) and inability to meet new demands (60 per cent).

5. Details about the labour saving devices

The different labour saving devices used by the surveyed households are given in the Table XVI.

TABLE XVI

LABOUR SAVING DEVICES AVAILABLE IN THE HOUSEHOLDS

S.No.	Devices	Percentage (N=300)
1.	**Non - Electrical**	
	Gas stove	18
	Pressure cooker	24
	Chapathi maker	18
	Water filter	15
2.	**Electrical**	
	Mixie	17
	Grinder	15
	Refrigerator	6

The table reveals the fact that under non-electrical appliances, 24 per cent of the 300 homemakers taken for the study had pressure cookers, 18 per cent possessed gas stoves and chapathi makers were there only with 18 per cent of the sample.

Under electrical appliances, 17 per cent of the homemakers taken for the study had mixies, 15 per cent had grinders and only 6 per cent possessed refrigerators.

C. Impact of the Action Programme

The impact of the action programme on the selected households is evaluated and presented under the following headings:

1. Information regarding technologies,
2. Water management,
3. Sanitary latrine,
4. Time management,
5. Money management,
6. Fuel management and
7. Views on the adopted technologies.

1. Information regarding technologies

Information with regard to the homemakers' awareness about the low cost technologies are discussed under the following aspects:

a. Awareness of the homemakers on the low cost technologies,
b. Ways to avoid fatigue,
c. Knowledge level of the technologies,
d. Opinion regarding the technologies,
e. Reasons for selection of low cost technologies and
f. Extent of adoption of low cost technologies.

a. Awareness of the low cost technologies

Some of the rural homemakers were not aware of the drudgery reducing low cost technologies like smokeless chulah, hay box, mud storage device, bio-gas, mud water filter, soak pit, kitchen gardening and sanitary latrine. They were given education about these technologies through action programme.

Awareness about these technologies before and after education as expressed by the homemakers is presented in the Table XVII.

TABLE XVII

AWARENESS OF THE LOW COST TECHNOLOGIES

S. No.	Technologies	Percentage (N=300)	
		Before education	After education
1.	Smokeless chulah	31	92
2.	Kitchen gardening	32	91
3.	Bio-gas	15	88
4.	Mud storage device	8	86
5.	Mud water filter	18	86
6.	Hay box	9	79
7.	Sanitary latrine	34	79
8.	Soak pit	10	78

The encouraging factor was that the education imparted had yielded appreciable results in making many homemakers

become aware of the drudgery reducing technologies. From the table, it is very clear that only 31 per cent of the sample had known about the smokeless chulah, but after imparting education, a large majority of them (92 per cent) became aware of the smokeless chulah ; 91 per cent of the homemakers became aware of kitchen gardening after creating awareness to that of 32 per cent before education. Eight per cent were aware of mud storage devices before education but 86 per cent became aware of it after education and only a few knew about mud water filter (18 per cent) and Hay box (9 per cent) earlier but the education given to the homemakers helped 86 per cent to become aware of both the appliances-mud water filter and hay box.

It is also evident from the table that after education more than 50 per cent had become aware of these technologies and it had created favourable impact on the homemakers with regard to the same (Figure 2).

b. Ways to avoid fatigue

Based on the survey findings regarding fatigue causing activities, education was imparted to 237 homemakers who had said that they had felt fatigue, to overcome fatigue by teaching work simplication method. Table XVIII presents clearly the steps taken by the homemakers to overcome fatigue as a follow up of the education imparted to them.

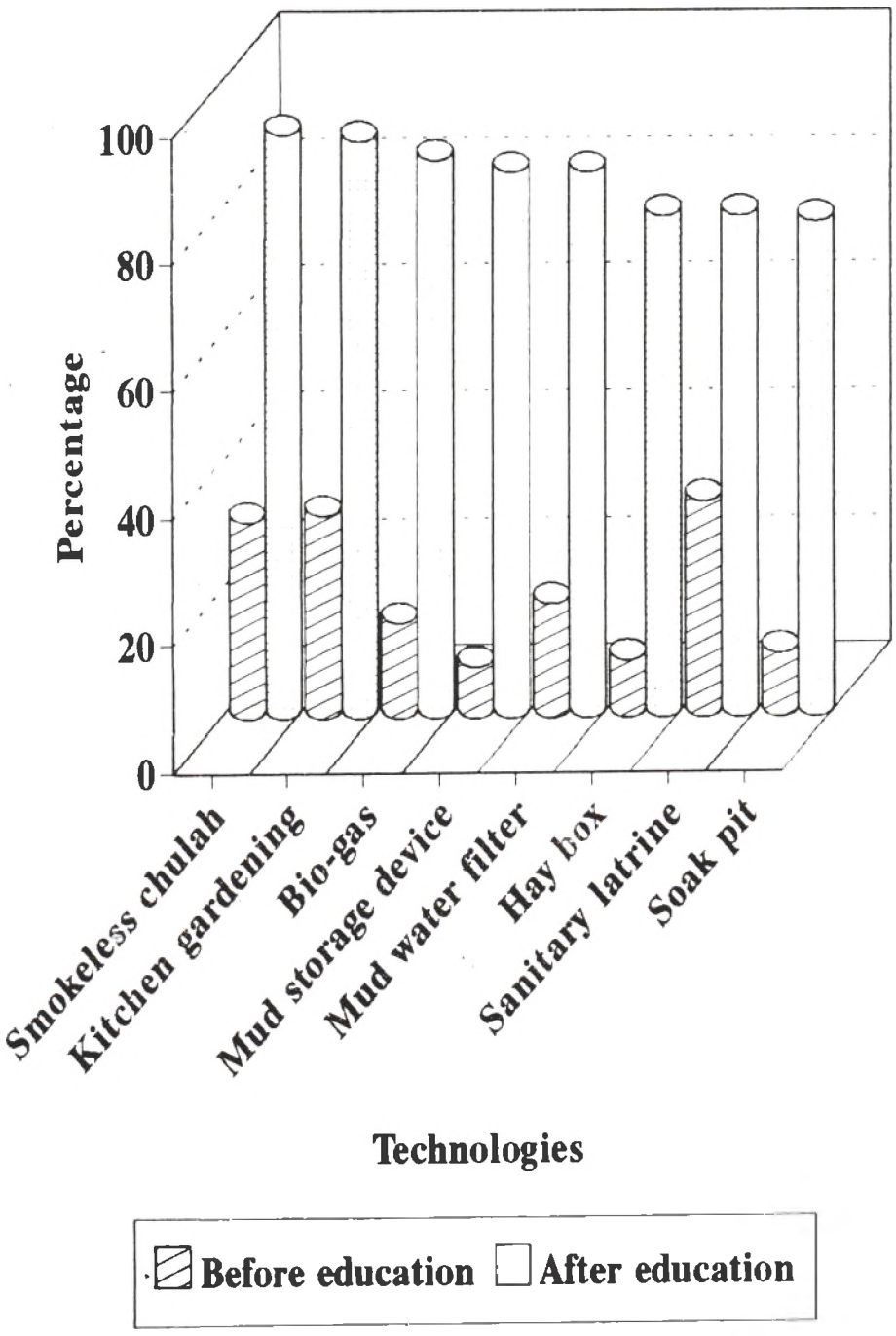

Figure 2. AWARENESS OF THE LOW COST TECHNOLOGIES

TABLE XVIII

STEPS TO OVERCOME FATIGUE

S.No.	Steps	Percentage* (N=237)
1.	Using labour saving devices	89
2.	Sharing the household work	86
3.	Organising work in an orderly way	71
4.	Improving work area	59
5.	Performing work when fresh and alert	52
6.	Taking rest in between work	47

* Multiple responses

It is evident from the above table that 89 per cent of homemakers had felt that using labour saving devices will help to overcome fatigue and 86 per cent had said sharing the household work with other members of the family. Forty seven per cent had viewed that taking rest in between work will relieve them from fatigue.

c. Knowledge level of drudgery reducing technologies

Based on their knowledge level regarding these technologies, education was imparted to the homemakers.

Knowledge level regarding drudgery reducing technologies before and after education by the homemakers is shown in the Table XIX.

Knowledge level of the homemakers with regard to the technologies was categorised under three headings, namely, low, average and high.

If they had given correct responses for all the items they were categorised as high. If their responses were correct for half of the items put to them, they were categorised as Average and if their responses were correct or partially correct to only 25 per cent of the items, they were categorised as "low".

It is observed from the table that after education, the knowledge level with regard to the smokeless chulah of the homemakers had high scores (62 per cent) followed by average (30 per cent) and low level (8 per cent).

Thus it could be concluded that 50 per cent of the homemakers were in high and average levels of knowledge category. The reason might be that the homemakers of selected rural areas were sufficiently exposed to these practices through different methods of education.

d. Opinion level

Opinion on drudgery reducing technologies by the homemakers after education is presented in the Table XX.

TABLE XX

OPINION ON THE TECHNOLOGIES

S. No.	Technologies	Opinion Percentage (N=300) Poor	Fair	Good
1.	Bio-gas	18	29	53
2.	Improved kerosene stove	34	55	11
3.	Pressure cooker	15	70	15
4.	Smokeless chulah	18	12	70
5.	Hay box	21	31	48
6.	Mud storage device	10	26	64
7.	Mud water filter	14	22	64
8.	Kitchen gardening	8	24	68
9.	Soak pit	11	39	50
10.	Sanitary latrine	11	29	60

The table clearly explains that a majority of 70 per cent of the homemakers had good (favourable) opinion towards the smokeless chulah followed by 18 per cent poor and 12 per cent fair opinion for it.

The opinion towards the kerosene stove was that 55 per cent had fair followed by poor (34 per cent) and good (11 per cent).

It was found that 60 per cent of the homemakers had good opinion scores on the mud storage device, mud water filter, kitchen gardening and sanitary latrine.

Seventy per cent of homemakers had fair opinion towards the pressure cooker, followed by those who had poor and good (15 per cent) opinion towards the pressure cooker.

It indicates that as these technologies were recently introduced innovations, the homemakers of the area were aware of it and they became interested in them. They had realised the advantages of the innovation and thus, above 50 per cent of the homemakers had favourable opinion about them.

It could be concluded that after education, the majority of the respondents' opinion were in good and fair categories. On the other hand, before education a large majority of the respondents belonged to the low knowledge category. This was a clear indication of the favourable impact of the extension programmes on the homemakers of the area selected for the study.

e. Reasons for adoption of low cost technologies

Homemakers had realised the importance and use of low cost technologies through education and training given to them. The reasons for the adoption of low cost technologies after education as expressed by the homemakers are given in the Table XXI.

TABLE XXI

REASONS FOR ADOPTION OF LOW COST TECHNOLOGIES

S.No.	Reasons	Percentage* (N=300)
1.	Conserves fuel	88
2.	Maintains kitchen neat	86
3.	Minimizes time	85
4.	Makes kitchen work enjoyable	84
5.	Saves money	83
6.	Gives status	82
7.	Relief from hazard	78
8.	Saves labour	76
9.	Helps to use the resources efficiently	72
10.	Helps to get more leisure time	68

* Multiple responses

It can be noticed that a majority (88 per cent) of the homemakers had revealed that they could conserve fuel followed by maintaining kitchen neat (86 per cent) and conserve time (85 per cent), while 68 per cent had stated that they could get more leisure time.

From this we can conclude that the homemakers had very clear knowledge about the advantages of the low cost technologies due to the education imparted by the investigator.

f. Extent of adoption of low cost technologies

Table XXII gives a clear picture of the various low cost technologies adopted by the homemakers.

TABLE XXII

EXTENT OF ADOPTION OF LOW COST TECHNOLOGIES

S.No.	Technologies adopted	Percentage* (N=300)
1.	Kitchen gardening	73
2.	Smokeless chulah	70
3.	Hay box	66
4.	Mud water filter	64
5.	Mud storage device	59
6.	Sanitary latrine	40
7.	Soak pit	11
8.	Bio gas	9

* Multiple responses

Among the 300 homemakers who were given education on low cost technologies, 73 per cent had adopted the practice of raising kitchen gardens in their yards and 70 per cent of the households had adopted the smokeless chulah and 66 per cent hay box, while 9 per cent had adopted bio gas and 11 per cent the soak pit (Plate II).

Homemaker using Smokeles Chulha

Homemaker using Janatha refrigerator

Constructed latrine

Constructed Soakpit

Plate 2. ADOPTION OF LOW COST TECHNOLOGIES

Of the eight low cost technologies about which education was imparted to 300 homemakers of the three villages, five technologies viz., smokeless chulah, hay box, mud storage device, kitchen gardening and mud water filter had been adopted by more than 50 per cent of the sample.

From the above analysis, it is evident that knowledge, opinion and practice are interrelated. People will not accept any programme if they do not have the knowledge about it or favourable opinion towards it.

Opinion towards a particular programme is influenced mostly by the knowledge of it. First, people acquire the knowledge. Secondly based on this knowledge, an opinion is formed. Thirdly, the opinion is manifested through an action practice. So a favourable opinion is essential for diffusion and adoption of new ideas or innovations.

2. Water management

The information with regard to water management of the selected households are discussed on the following aspects:

a. Water purification techniques,

b. Water conservation techniques,

c. Mud water filter and

d. Waste water disposal and treatment.

a. Water purification techniques adopted by the selected homemakers

More than 80 per cent of people inhabiting in the rural areas had no access to safe drinking water. The non-availability of safe drinking water had a direct bearing on the working condition and level of health of the people. Infection spreads through water and inadequate quantity of water for personal hygiene also results in ill health. Most of the rural households had not followed any purification method to make water safe, as they considered the bore well water, which was the main supply source, is free from contamination. To safeguard the health of the people against water borne diseases, the different water purification methods were taught. They were coagulation, boiling and sedimentation and filteration. These methods were explained to the homemakers through demonstrations and discussions.

Table XXIII shows the different water purification techniques practised before and after education by the homemakers.

TABLE XXIII

WATER PURIFICATION TECHNIQUES

S.No.	Methods	Percentage* (N=300) Before education	After education
1.	Boiling and filtering	30	83
2.	Straining through cloth	7	73
3.	Filtering through candle filter	7	66
4.	Alum	-	12
5.	Alkali	-	10
6.	Chlorination	-	6

* Multiple responses

It is clear from the table that after education, homemakers became aware and understood the importance of water purification and practised those techniques which they had learnt through education. Boiling was the common method adopted by majority (83 per cent) of the homemakers, 73 per cent purified by draining through cloth whereas 66 per cent used water filter. Only six per cent purified water by chlorination method.

b. Water conservation techniques

In rural areas people were not getting adequate drinking water. Homemakers had to walk 2 to 3 kilometers to fetch water. This work tired them and it led to fatigue and

created drudgery. Education was imparted to them on water conservation techniques.

The water conservation techniques which were adopted by the homemakers are given in the Table XXIV.

TABLE XXIV

WATER CONSERVATION TECHNIQUES

S.No.	Techniques	Percentage* (N=300)
1.	Harvesting rain water (cooking dhal, bathing, cleaning and washing)	87
2.	Reuse of waste water (sprinkling the front yard, washing and cleaning the bathroom and toilet)	85
3.	Cleaning the vessels at one time	79
4.	Using limited quantity of water	75
5.	Close the tap after use	70
6.	Washing the clothes near the water source	70

* Multiple responses

Table XXIV shows that after education, a lot of improvements had taken place in conserving water among the selected homemakers. Eighty seven per cent of the families were harvesting rain water during rainy season, 85 per cent reused waste water for sprinkling front yard and cleaning and washing the bathroom and toilet, whereas 70 per cent were closing the water tap after use.

c.i) Introducing the mud water filter

The water purifying device was introduced to the homemakers highlighting its parts, operational procedures and importance through lectures, demonstrations and exhibitions. At the end of the demonstration, interested homemakers were persuaded to purchase the cheap mud water filter for their use in the households.

It is encouraging to point out that on the whole, out of 300 households to whom education was imparted, 192 households were fully convinced and they had purchased the mud water filters and were using them in their houses.

ii) Efficiency of mud water filter

The efficiency of the mud water filter was assessed by the homemakers taking into consideration the time required to purify water and the occurrence of leakage through the sides of the filter. They had reported that water filtered during the first five days was not palatable due to peculiar soil smell and taste of new mud container. The mud water filtered thereafter did not possess any undesirable characteristics.

iii) Advantages of mud water filter

Advantages of using mud water filters as expressed by the homemakers are given in the Table XXV.

TABLE XXV

ADVANTAGES OF USING MUD WATER FILTER

S.No.	Advantages	Percentage* (N=192)
1.	Gives safe drinking water	96
2.	Provides cold water in summer	94
3.	Free from turbidity	84
4.	Prevents water borne disease	80
5.	Easy to maintain	70
6.	Cheap	60

* Multiple responses

Table XXV shows that out of 192 homemakers who were using mud water filter, a large majority (96 per cent) of them had stated that it helped to get safe drinking water, followed by 94 per cent who had said that it provided cold water in summer, whereas 70 per cent had said that it was easy to maintain and 60 per cent had stated that it was cheap. It can be concluded that the homemakers had realised the importance of purification method through practical adoption.

d. i) Waste water disposal and treatment

Based on the problems faced in waste water disposal by the surveyed families, the homemakers were given education on the different methods of disposal of waste water.

The following table depicts the different methods of disposal of waste water adopted by the homemakers before and after education.

TABLE XXVI

WASTE WATER DISPOSAL METHODS

S. No.	Methods adopted	Percentage (N=300) Before education	After education
1.	Connected to main sewer	6	31
2.	Diverted for raising kitchen garden	32	69
3.	Allowed to stagnate near gutter	62	-

It is very clear from the above table that after imparting education on waste water disposal to the homemakers, a majority (69 per cent) of the families were diverting the waste water to the kitchen garden, against 32 per cent before education. Before education 62 per cent of the families were allowing stagnation of water near gutter, after education none of them had resorted to stagnate the waste water.

ii) Waste water treatment

Water being one of the most important necessities of life, supply of safe and potable water is being given top

priority in the welfare programmes and a variety of schemes in large numbers are being taken up all over the country. The use of water for domestic needs is thereby increasing and gives rise to the problems of collection, conveyance and disposal of waste water. The roads in villages are normally not planned properly. It is difficult technically and economically to construct drains to their sides for carrying away the waste water let out by all the houses stagnated on the roads and in open places and accumulated in ditches and low lying areas causing nuisance and health hazards. The mosquitoes breed on the stagnated water, transmit dreadful diseases like malaria and filaria.

Waste water treatment in an area needs top most consideration because stagnant waste water is dangerous to health and may even contaminate fresh water, causing damage to the health and environment. Better utilisation of waste water is necessary for improvement of environment. Waste water can be taken to the soak pit or diverted to raise kitchen garden and these methods were demonstrated to the homemakers and they were persuaded to adopt these methods. Before education waste water was not utilized effectively by 72 per cent of the households. Through education, reuse of waste water methods were explained to the homemakers. After education, a large majority (85 per cent) of the households reused the waste

water for various household activities like washing the bathroom, cleaning the gutters, sprinkling water in the front yard and for kitchen gardening. Sixty seven per cent of the households had reported that they were diverting waste water to the kitchen garden. The Block Development Office under the scheme "Social Forestry" helped the rural people by agreeing to supply murungai (100), papaya (100) and teak (100) saplings and vegetable seeds to the people of the three selected villages and the investigator collected the saplings from the Block Development Office and distributed them to the homemakers after giving education.

The Majority (72 per cent) of the households had reported that they had gotten good and fresh vegetables, greens, murungai and papaya for their domestic use from their gardens. Through the cultivation of vegetables in their yards, the homemakers were able to save money which they used to incur on purchase of vegetables and they were getting fresh vegetables which minimized their going to the market to purchase vegetables, thus saving time.

Waste water utilisation for the production of vegetables can be successfully adopted by the households. The individual's doubts regarding preparation of land, raising the plants and manuring were clarified through informal talks. Distribution of saplings and seeds had

motivated many households to utilize waste water for raising kitchen gardens after education.

iii) Benefits acquired through kitchen gardening

After getting education, 219 homemakers had raised kitchen gardens in their yard and the benefits acquired by the homemakers through proper diversion of waste water to kitchen garden are given in Table XXVII.

TABLE XXVII

BENEFITS ACQUIRED BY DIVERSION OF WASTE WATER TO KITCHEN GARDEN

S.No.	Benefits	Percentage* (N=219)
1.	Prevents stagnation of water	90
2.	Provides good environment	85
3.	Avoids filthy appearance	84
4.	Getting fresh vegetables	81
5.	Enhances aesthetic surrounding	80
6.	Provides neat and clean surroundings	79
7.	Minimizes health hazards	76
8.	Improves the plant growth and yield	74
9.	Enables reuse of waste water	72

* Multiple responses

The table clearly shows that a large majority (90 per cent) of them had stated that proper diversion of waste

had
water prevented stagnation of water, while 72 per cent had said that it enabled reuse of waste water.

Out of 300 households taken for imparting education, 219 (73 per cent) of the households were diverting waste water to kitchen garden.

The reasons for not raising kitchen garden by the 27 per cent households were due to lack of space, lack of time, lack of interest and limitations of technical know-how.

iv) Soak pit

A Soak pit is essential in areas where there is no space for surface drainage and disposal of waste water. A Soak pit functions effectively in places where the soil has good water percolation capacity. The provision of a soak pit keeps the environment neat and clean, preventing stagnation of water, control breeding of mosquitoes, avoids health hazards and prevents pollution.

Several informal talks and demonstrations were held subsequently to know about the details of a soak pit and motivated the households to construct it.

Out of 300 households taken for the study only 33 households had constructed the soak pit.

Benefits acquired by use of soak pit

Advantages of soak pit as expressed by the homemakers who had adopted this technology are given in the Table XXVIII.

TABLE XXVIII

ADVANTAGES OF SOAK PIT

S.No.	Advantages	Percentage* (N=33)
1.	Enhances aesthetic surroundings	85
2.	Arrests breeding of mosquitoes and flies	83
3.	Minimizes health hazards	81
4.	Prevents water stagnation	79
5.	Healthier way to dispose sullage water	76
6.	Prevents environmental pollution	75
7.	Absorbs the waste water well	73
8.	Provides healthy surroundings	71
9.	Easy to remove the suspended and settleable particles	70
10.	Requires simple skill and technology	70
11.	Can utilize the surface area of soak pit	69
12.	Easy to maintain	63
13.	Occupies less space	60

* Multiple responses

The table clearly gives a complete picture of the advantages of the soak pit as expressed by the 33 homemakers who had put the soak pits in their yards. Eighty five per cent had

stated that the soak pit enhances aesthetic surroundings, 83 per cent had said that it arrests mosquito breeding and flies, followed by minimizes health hazards (81 per cent) and prevents water stagnation (79 per cent). Sixty three per cent had said easy to maintain and 60 per cent had viewed that it occupies less space.

We can conclude that the benefits perceived by them were environmental sanitation, health protection and reducing the drudgery of the homemakers.

Obviously, a great amount of health education and pre-installation canvassing were required for enhancing the acceptability of soak pits. Training was imparted to the beneficiaries initially at the time of installation and again as a follow - up in order to ensure continuous use.

v) **Reasons for non-adoption**

The 267 homemakers who had not put up soak pits in their houses had given various constraints for non-adoption like economic, technological, operational, psychological and socio-cultural with various degrees of seriousness.

More than half of the respondents (64 per cent) who belonged to very poor category had reported that soak pits were not economical as the initial cost for construction was high.

All the respondents were facing the problems with the operational and technical know-how of soak pits. They did not have adequate technical knowledge about the construction and maintenance of soak pits. Less than half of the respondents (43 per cent) could not adopt it due to the psychological reasons. A good number of the respondents (60 per cent) had faced socio-cultural constraints because elders of the households did not allow or want to use these pits because they felt that it caused dampness to the foundations of the building. A huge majority of the respondents (86 per cent) could not put up the soak pit as they had no space in the back yards.

3. Sanitary latrine

After education all became aware of environmental hygiene, health and importance of latrine.

Among 300 households for whom education on low cost latrine was imparted, 49 per cent came forward and had constructed latrines in their houses.

Latrines were constructed on one side of the house in 44 per cent of the households and at the back of the house in 28 per cent cases. All the households wanted to have the latrine constructed with the superstructure. In order to reduce the cost involved in construction, one wall of the

house was utilized. Those who had constructed latrines as a separate structure modified the already existing bathrooms into a super structure. All the households had expressed their appreciation with the design, materials used, the technology involved and the quality of work. The homemakers had expressed their happiness in having the latrines near the house. In all the houses, grown up children above 8 years of age and women were using the latrines regularly. The views as expressed by the women on the sanitary latrine were : it promotes hygiene (89 per cent), develops healthy habits (87 per cent), affords privacy (84 per cent), assures security (82 per cent), removes mental and physical tension (79 per cent), protects the environment (78 per cent), prevents health problems (72 per cent) and helps to inculcate cleanliness concept among children (70 per cent).

Ways to keep toilet clean

After imparting education, different methods of keeping the common public toilet clean were suggested.

The extent of practising the methods as expressed by the homemakers are presented in Table XXIX.

TABLE XXIX

WAYS TO KEEP TOILET CLEAN

S.No.	Ways	Percentage* (N=300)
1.	Cleaning daily	39
2.	Cleaning once in a week	38
3.	Using latrine properly	38
4.	Using enough quantity of water to clean	37

* Multiple responses

It is clear from the above table that on an average 39 per cent of the families taken for the study had suggested "daily cleaning" and 38 per cent had suggested using latrine properly for the clean upkeep of the toilet.

4. Time management

Time management is discussed under the following headings.

a. Time utilization pattern,

b. Time saving techniques and

c. Utilization of the time conserved

a. Time utilization pattern of homemakers

The homemakers were given education on time management. Earlier they had not planned their time. The education given to them had enlightened them to plan the timings for the activities and they were able to save some time daily which they utilized for more purposeful immediate activities.

Time utilization pattern of the selected homemakers before and after getting education is shown in Table XXX.

TABLE XXX

TIME UTILIZATION PATTERN OF THE HOMEMAKERS

S. No.	Activities	Time spent in mts (N=300) Before education	After education
1.	Stocking of fuel	0.40	0.30
2.	Preparation and cooking of food	5.40	5.25
3.	Serving of food	0.30	0.24
4.	Cleaning utensils	0.40	0.35
5.	Cleaning of home	0.25	0.15
6.	Sweeping	0.20	0.12
7.	Washing Cloth	2.00	1.45
8.	Child care	1.45	1.35
9.	Personal care	0.20	0.30
10.	Live stock care	2.00	1.40
11.	Fetching water	0.50	0.35
12.	Care of sick	0.50	0.50
13.	Travel	0.45	0.30

It is clear from the table that the homemakers were spending on an average five hours and 40 minutes for preparation and cooking of food before education but after education they were doing cooking within five hours and 25

minutes by using the low cost technologies and thus saving 15 minutes which could be used for personal care.

From the table we can conclude that after education homemakers had realised the importance of time, use of low cost labour saving devices, methods of work simplification and need for personal care, thus reducing time for all household activities and increase the time thus saved for their personal care and care of the family members.

b. Time saving techniques

Women had to perform all tasks of the home as well as taking care of children and other family members. They were facing physical as well as mental fatigue. Time is a very valuable resource in the modern era. It must be managed most efficiently to have maximum productivity without adversely affecting health as well as personal and social life of people. The women in rural areas spend a considerable amount of time on various household activities. Hence, there is a need to find out ways and means of reducing the work load of rural women in household activities to enable them to devote more time in productive activities and in the care of their children and other family members. Therefore, education on time management and time saving techniques for different household tasks were given to the 300 homemakers of the three villages.

To assess the impact of the education imparted to the homemakers on time management, the practice of time saving techniques/devices adopted by them for different household activities were studied and the findings are presented in the Table XXXI.

TABLE XXXI

TIME SAVING TECHNIQUES

S.No.	Techniques	Percentage* (N=300)
1.	Use of labour saving devices	82
2.	Clubbing related activities wherever possible	79
3.	Give priority to important tasks	74
4.	Distribute tasks among family members	70
5.	Arrange work in sequence	69
6.	Make the household activity plan flexible	64
7.	Set apart sometime for personal and recreational activities as well as for family members	61
8.	Provide sufficient time to do each task satisfactorily	59

* Multiple responses

It is observed from the table that after education, 82 per cent of the homemakers had reported using labour saving devices like hay box, bio-gas, smokeless chulah and mud storage device to conserve time, while 59 per cent provided sufficient time to do each task satisfactorily. It is encouraging to note that the impact of the education

imparted had a favourable effect and the homemakers were adopting many techniques that were imparted to them in the action programme.

c. Utilization of the time conserved

During the action programme, the homemakers were motivated to adopt drudgery reducing technologies in their houses. Due to the adoption of the technologies, the homemakers conserved their time for cooking, purchase of fuel, water, vegetables and travel.

The time thus conserved through the adoption of the technologies were utilized for various activities by the homemakers as expressed in the Table XXXII.

TABLE XXXII

EXTENT OF UTILIZATION OF THE TIME CONSERVED

S.No.	Extent of utilization	Percentage* (N=300)
1.	Having mental rest and satisfaction	84
2.	Getting physical rest and relaxation	82
3.	Getting adequate time to do home making activities	80
4.	Fostering family well being and happiness	79
5.	Taking care of family members	78
6.	Having time for recreational activities	75
7.	Taking care of personal and family health	66

* Multiple responses

It is clear from the table that 84 per cent had stated that the time so conserved as a result of adopting new household technologies provided mental rest and satisfaction whereas 66 per cent were utilizing the time thus saved for taking care of personal and family health.

5. **Money management**

Next to time saving techniques, education on money management was imparted to the rural homemakers. The main objective was to enhance healthy living by making the best use of the income of the family.

The money management practices of the selected families revealed that earlier most of them (90 per cent) had never planned their family budget. Very few families (10 per cent) had planned their budget by maintaining daily accounts.

After imparting education, it was found that 75 per cent of families had developed the habit of planning their budget by keeping daily accounts.

The details on money management practices of the selected families are discussed under the following headings.

a. Family expenditure pattern

b. Methods of controlling family expenditure and

c. mode of saving.

a. Family expenditure pattern

The sample household homemakers were given education on "Family Budget" and Table XXXIII presents a clear picture of their household expenditure pattern they were doing earlier and how they had streamlined the expenditure pattern after getting education on family budget.

TABLE XXXIII

HOUSEHOLD EXPENDITURE PATTERN

S. No.	Items	Average expenditure in percentage (N=300) Before education	After education
1.	Food	48.00	38.00
2.	Clothing	2.87	4.00
3.	Shelter	1.38	1.00
4.	Fuel	8.99	6.00
5.	Education	1.76	5.00
6.	Health	10.00	10.00
7.	Transport	8.00	6.00
8.	Recreation	4.00	6.00
9.	Celebration of festivals	8.00	8.00
10.	Maintenance like white washing, painting and other repairs	3.00	6.00
11.	Savings	4.00	10.00
		100.00	100.00

The above table clearly shows as to how the sample homemakers had received the education imparted to them on family budgeting and the extent to which they had utilized it in their day-to-day living. Earlier homemakers were spending on an average 48.00 per cent of their total income on food but after imparting education they were spending only 38.00 per cent for food, thus saving 10 per cent of their income; 8.99 per cent for fuel whereas after education, they were spending only six per cent and also the expenditure on shelter as rent which was 1.38 earlier but after getting education they had reduced it to 1.00 per cent.

Thus the homemakers had reduced expenses on all items of expenditure on day-to-day living and were able to save money which they were spending on essential items like clothing, children's education and recreation.

This shows that the education they had acquired on family budget helped the homemakers plan their family expenditure for a happy life.

b. Methods of controlling family expenditure

Table XXXIV shows that after education the following methods were adopted by the homemakers to control their family expenditure.

TABLE XXXIV

METHODS OF CONTROLLING FAMILY EXPENDITURE

S.No.	Methods	Percentage* (N=300)
1.	Cutting down unnecessary expenditure	66
2.	Postponing the less important items of expenditure	59
3.	By borrowing less money	54

* Multiple responses

It is clear from the above table that after education, 66 per cent of the homemakers had cut down their unnecessary expenditure and 54 per cent of them had developed the habit of borrowing less money from relatives and family friends in order to lessen their loan burden. This shows that after education they had learnt to control family expenditure pattern.

c. Saving pattern

Of the 300 homemakers who were given education on family budget and savings, 93 per cent had developed the habit of saving the money.

Table XXXV indicates the mode of saving pattern of the selected households.

TABLE XXXV

MODE OF SAVING

S.No.	Method of savings	Percentage* (N=279)
1.	Post Office	42
2.	Local Chits	38
3.	Banks	7
4.	Finance Investment Companies	13

* Multiple responses

The table clearly shows that 42 per cent of them were depositing their savings in the post office. Chit fund was preferred by 38 per cent while 13 per cent saved through finance investment companies, only seven per cent saved their money in nationalised banks.

This shows that the sample had developed the habit of including saving as an item under family budget after education.

6. Fuel management

Fuel management is discussed under the following headings:

a. Type of stove used,

b. Frequency of cleaning the chulah,

c. Regularity of procurement of fuel,

d. Fuel conservation techniques,

e. Benefits of using smokeless chulah,

f. Hay box,

g. Biogas and

h. Mud storage device.

a. Type of stove used

Cooking was found to be the major work in the home for the homemakers. It was a drudgery, pains taking and time consuming task carried out by homemakers. In the rural areas normally the homemakers were making use of the traditional chulah.

Education was given to the homemakers as to what type of oven they had to use in order to conserve energy and money. Homemakers had given the type of oven they were using before and after education, the information is presented in the following Table XXXVI.

TABLE XXXVI

TYPE OF STOVE USED

S. No.	Type of oven	Percentage* (N=300)	
		Before education	After education
1.	Traditional chulah	100	42
2.	Smokeless chulah	18	64
3.	Kerosene stove	28	36
4.	Gas stove	19	31

* Multiple responses

Before education all the homemakers were using traditional chulahs for cooking. The smokeless chulah (18 per cent) and gas stove (19 per cent) were used only by a few homemakers.

After education, 64 per cent began to use the smokeless chulah and 31 per cent the gas stove.

b. Frequency of cleaning the chulah

Table XXXVII depicts the frequency of cleaning the chulah by the homemakers before and after education.

TABLE XXXVII

FREQUENCY OF CLEANING THE CHULAH

S. No.	Frequency of cleaning	Percentage (N=300)	
		Before education	After education
1.	Daily	10	60
2.	Weekly	24	33
3.	Monthly	48	5
4.	Occasionally	18	2

It is encouraging to note that after education, 60 per cent of the homemakers had practised the habit of cleaning the chulah daily compared to 10 per cent before education and only two per cent were cleaning occasionally.

c. Frequency of procurement of fuel

Table XXXVIII indicates the frequency of procurement of fuel like firewood and twigs by the selected homemakers before and after education.

TABLE XXXVIII

FREQUENCY OF PROCUREMENT OF FUEL

S. No.	Frequency	Percentage (N=300) Before education	After education
1.	Daily	54	21
2.	Alterate days	31	14
3.	Weekly	8	31
4.	Fortnightly	5	6
5.	Monthly	2	28

The frequency of procurement of fuel varied from daily to monthly. Eight per cent of the sample taken for the study used to procure weekly before education, but it increased to 31 per cent after education. A meagre two per cent were procuring fuel every month before education, but after education it rised to 28 per cent. It is interesting to note that after education most of the homemakers had changed to weekly (31 per cent) and monthly (28 per cent) procurement

of fuel, thus saving some time which they used for more important activities or for taking rest.

d. Fuel conservation techniques

In rural areas, the homemakers were spending more time for fuel collection and were spending more fuel for household activities. Through action programme, they were taught fuel conservation techniques and were motivated to adopt fuel conservation techniques in their houses.

After imparting education, irrespective of the educational status of the homemakers, almost all homemakers in the rural areas had adopted certain fuel conservation techniques. This is given in the Table XXXIX.

TABLE XXXIX

FUEL CONSERVATION TECHNIQUES ADOPTED

S. No.	Fuel conservation techniques	Percentage* (N=300)
1.	Preplanning and keeping items ready before lighting the flame	100
2.	Reducing the flame at appropriate time	94
3.	Using proper size of utensils	84
4.	Using aluminium utensils for cooking	84
5.	Keeping just sufficient quantity of water for cooking	79
6.	Minimising use of fuel	78
7.	Soaking pulses one hour before cooking	72
8.	Utilizing effective heat available in chulah	70
9.	Restricting the number of times of meals preparations	52
10.	Using Hay Box	65
11.	Using pressure cooker	42
12.	Using Hot case	37

* Multiple responses

The table shows that all the homemakers who were given education on fuel conservation techniques had stated that they were preplanning and keeping items ready in advance before lighting the flame. Ninety four per cent were reducing the flame at appropriate time and 84 per cent each using proper size of utensils and using aluminium utensils

for cooking were adopted to avoid delay and wastage of fuel, while only 37 per cent of households were using the hot case to avoid reheating and wastage of fuel.

This shows that the action programme had convinced the homemakers to adopt the fuel conservation techniques and practise it in their homes. This had benefited them in terms of conserving the fuel, labour, time and money.

e.i) Benefits of using smokeless chulah

Two hundred nine out of 300 homemakers had put up smokeless chulahs in the household kitchens after they had received education on the smokeless chulah conducted by the investigator.

It is quite interesting to note that most of the homemakers became aware of the smokeless chulah and its benefits through the education imparted to them.

The homemakers had expressed the benefits by installing the smokeless chulah and they are shown in Table XL.

TABLE XL

BENEFITS OF USING SMOKELESS CHULAH

S.No.	Benefits	Percentage* (N=209)
1.	Eliminates smoke from kitchen	100
2.	Saves time	100
3.	Gives soot free utensils	98
4.	Economises fuel use	89
5.	Transmits heat evenly	82
6.	Lends for the use of all types of fuel	82
7.	Simple technology	80
8.	Reduces health problems	76
9.	Suitable for daily cooking	72
10.	Cost of construction cheap	72
11.	Lessens drudgery in cooking	69
12.	Easy handling and maintenance	69

* Multiple responses

All the 209 homemakers who were using the smokeless chulah had reported that it saves time and eliminates smoke from kitchen, while 69 per cent had stated that it lessens drudgery in cooking and was easy to handle and its maintenance was simple.

ii) Extent of Utilization

Extent of utilization of the smokeless chulah by individual homemakers is depicted in the Table XLI.

TABLE XLI

EXTENT OF UTILIZATION

S.No.	Various practices	Extent of utilization percentage (N=209)		
		Always	Occasionally	Never
1.	How often do you make use of front dampers	76	11	13
2.	How often do you make use of back dampers	66	32	2
3.	How often do you keep the cooked food hot according to the need	58	34	8
4.	How often do you clean the chimney	49	31	20
5.	How often do you repair your chulah	50	36	14

It is evident from the table that 76 per cent of the homemakers had always used the front dampers, 11 per cent used it occasionally and 13 per cent had never made use of front damper, 66 per cent had always used back dampers, 32 per cent used it occasionally and two per cent had never used back dampers.

It was also found that 49 per cent of homemakers regularly cleaned the chimney, whereas 31 per cent cleaned the chimney occasionally and 20 per cent had never cleaned the chimney.

iii) Reasons for non-adoption of smokeless chulah

Out of 300 samples taken for the action programme, 209 had put up the smokeless chulahs. There were 91 households who had not put up smokeless chulahs in their houses and the reasons as expressed by the homemakers for non-adoption of smokeless chulah are presented in Table XLII.

TABLE XLII

REASONS FOR NON-ADOPTION

S.No.	Reasons	Percentage* (N=91)
1.	Construction problems :	
	Defective construction	38
	Non-suitability of site	28
2.	Problems regarding use :	
	Not easy to light fire	30
	Not much useful for short period	30
	Difficulty of heating during winter	31
3.	Maintenance problems :	
	Difficulty in cleaning the chimney	25
	Burning of chimney	27
	Problems regarding repair and maintenance	24
	Difficulty in replacing the chimney and dampers	36
4.	Other problems :	
	Lack of awareness about smokeless chulah	12
	Traditional values attached with local chulah	22

* Multiple responses

The reasons listed out by the non-adopters of the smokeless chulah were of different types which were categorised as problems in construction, use, maintenance and other problems.

The table shows that 38 per cent of the homemakers had pointed out 'defective construction' as the main reason for non-adoption of the chulah, "Difficulty in replacing the chimney and dampers" (36 per cent) emerged as the second reason for non-adoption of the chulah, 31 per cent had stated that "Difficulty of heating during winter" was found to be third reason. Under other problems 22 per cent had stated that they were bound by traditional values attached with local chulah and 12 per cent had said lack of awareness about smokeless chulah.

f. Hay box

Three hundred homemakers of the three villages were imparted education on the utility of the hay box as part of the action programme.

The educational programme was successful to the extent of enthusing 199 women out of 300 to be prepared to make use of the hay box. Demonstrations followed by discussions were held to explain the effectiveness of the hay box.

The homemakers who had used the hay box at the household level had prepared different recipes and had expressed satisfaction over its use.

i) Items prepared

The various items prepared by them are given in Table XLIII.

TABLE XLIII

ITEMS PREPARED

S.No.	Items	Percentage (N=199)
1.	Rice	100
2.	Pongal	100
3.	Tomato rice	100
4.	Chicken briyani	45
5.	Green gram sundal	32

The homemakers had prepared several items using the hay box. From the table it can be inferred that all the homemakers had expressed full satisfaction about the use of hay box in preparing rice, pongal and tomato rice which were the normal food preparations that they were normally taking. Even preparation of chicken briyani and green gram sundal was attempted. This shows that the homemakers were very much interested in using the hay box.

ii) Palatability of the cooked items

The homemakers were asked to judge the palatability of the food items prepared in the hay box in terms of tenderness, doneness, colour, taste and flavour and their remarks are presented in Table XLIV.

TABLE XLIV

PALATABILITY OF FOOD ITEMS COOKED IN THE HAY BOX

Percentage N : 199

S.No.	Items	Tenderness			Doneness			Colour			Taste			Flavour		
		G	F	P	G	F	P	G	F	P	G	F	P	G	F	P
1.	Rice	100	-	-	100	-	-	100	-	-	100	-	-	80	10	10
2.	Pongal	80	15	5	82	18	-	89	11	-	100	-	-	100	-	-
3.	Tomato rice	80	13	7	100	-	-	80	10	10	100	-	-	100	-	-
4.	Chicken Biriyani	90	10	-	100	-	-	70	15	15	100	-	-	100	-	-
5.	Greengram sundal	70	15	15	60	25	15	75	15	10	80	15	5	75	15	10

G - Good; F - Fair; P - Poor

All the 199 homemakers had remarked that rice cooked by using hay box was found to be superior in the different aspects such as tenderness, doneness, colour and taste.

Pongal prepared in hay box was very tasty and had good flavour and was found to be highly appreciated by all.

Tomato rice prepared by using hay box was liked by all the homemakers for its taste, flavour and doneness and they were surprised to see the efficiency and economy in preparing food using hay box.

The chicken briyani prepared by using hay box was liked by all for the doneness, taste and flavour and by 90 per cent for the tenderness.

The green gram sundal prepared by using hay box was not upto their satisfaction like other food items.

iii) Reasons for adoption of hay box

All the 199 homemakers were using the hay box regularly for preparing food because of its advantages. Fifty six per cent of the cooking time and forty six per cent of the money spent in fuel were found to have been saved through the use of hay box as revealed by all the homemakers. The temperature of rice cooked and kept in the hay box for five to six hours continued to maintain at 61^{o}C temperature, while the temperature of rice kept outside for the same

period had come down to 35°C. It was found to be convenient, inexpensive labour saving device for good home management and very useful time saving appliance to the career woman, who had to prepare the lunch for the family in the morning before she leaves home for her job. The maintenance of the hay box did not cost much, since all that was required for keeping the hay clean without getting soiled by soot or cooked foods and drying of hay in the sun for an hour or two every fortnight. It was a time, fuel, labour and money saving device. Since the method of cooking required minimum time of boiling and the cooking medium is completely absorbed by the food material, the nutrient loss was the minimum.

iv) Advantages of using hay box

Advantages of using the hay box as expressed by the 199 homemakers who had been using it regularly for cooking purpose after they were given education by the investigator are given in Table XLV.

TABLE XLV

ADVANTAGES OF USING HAYBOX

S.No.	Advantages	Percentage* (N=199)
1.	Saves time	100
2.	Conserves fuel	100
3.	Reduces labour	100
4.	Need not strain water	94
5.	Retains flavour of food	93
6.	Saves money	89
7.	Prevents charring and burning of food	85
8.	Helps to keep food warm	80
9.	Prevents nutrients loss	76
10.	Avoids reheating	30

* Multiple responses

All the homemakers who were using the hay box had viewed that the device helped to save time, fuel and reduced labour, whereas 94 per cent had stated that there was no necessity to strain water and 93 per cent had said that it retained flavour of food. Thirty per cent had stated that reheating of the prepared food was not needed while using the hay box.

v) **Reasons for non-adoption**

Out of 300 families, 101 had not adopted the hay box. The reasons for non-adoption of the hay box as given by the homemakers are presented in Table XLVI.

TABLE XLVI

REASONS FOR NON-ADOPTION

S.No.	Reasons	Percentage* (N=101)
1.	Non availability of hay	74
2.	Not interested	69
3.	No time	58
4.	Lack of money	41
5.	Not aware of its importance	39

* Multiple responses

It is clear from the above table that 74 per cent had stated that due to non-availability of hay, they had not adopted the hay box, while 39 per cent had stated that they were not aware of its importance.

g. Biogas plant

Out of 300 households for whom education was imparted on the biogas plant, only 26 had erected the biogas plant since it involved high cost, possession of cattles, availability of space and other related things.

i) Reasons for adoption

Table XLVII shows the reasons stated by the homemakers for the erection of a biogas plant.

TABLE XLVII

REASONS FOR ERECTION OF BIOGAS PLANT

S.No.	Reasons	Percentage* (N=26)
1.	Fuel saving	100
2.	Availability of cattle Dung	49
3.	By-product yield (getting manure)	39
4.	Availability of space	32

* Multiple responses

It is clear from the above table that all the 26 homemakers who had put up biogas plants had stated that it was fuel saving while 32 per cent had said 'availability of space'.

ii) Benefits acquired by using biogas plant

Benefits acquired by using a biogas plant as given by the homemakers are presented in Table XLVIII.

TABLE XLVIII

BENEFITS ACQUIRED BY USING BIOGAS PLANT

S.No.	Benefits	Percentage* (N=26)
1.	Makes cooking easy	90
2.	Reduces drudgery	86
3.	Enhances appearance of kitchen	80
4.	Saves time in cooking and cleaning	79
5.	Provides good quality manure	65
6.	No soot deposition on vessels	57
7.	Saves fuel cost	51
8.	Smoke-free kitchen	50
9.	Reduces eye and heart disease	45
10.	Prevents fly and mosquito breeding	25
11.	Enhancement of social prestige	20
12.	Helps in recycling waste	9

* Multiple responses

It is encouraging to note that 90 per cent out of 26 homemakers had stated that biogas makes cooking easy, 86 per cent had said reduces drudgery, 80 per cent were clear about the fact that it enhances appearance of kitchen, whereas 20 and 9 per cent had stated enhancement of social prestige and helps in recycling waste respectively.

This shows that even though the education imparted to the homemakers on biogas had been taken up only by 26 homemakers, the biogas had helped them to overcome the problems they were encountering with the other fuels and they were able to learn the proper usage of biogas.

iii) Problems encountered

Even though 26 homemakers had put up the biogas plants and to some extent satisfied with it, they had encountered certain problems.

Problems encountered by the homemakers with regard to the use of biogas are depicted in Table XLIX.

TABLE XLIX

PROBLEMS ENCOUNTERED

S.No.	Problems	Percentage* (N=26)
1.	Not getting sufficient gas for cooking	20
2.	Construction is not good	20
3.	Often gets repaired	18
4.	Not enough for large families	16
5.	Needs much care	16

* Multiple responses

The table explains the problems encountered by the 26 homemakers who had erected biogas plants : 20 per cent each

had stated that they were not getting sufficient gas for cooking and construction is not good, while 16 per cent had expressed that the biogas needed much attention and not enough for large families as it gives only limited quantity of gas.

iv) Reasons for non-adoption

Reasons for non-adoption of biogas plants as expressed by the 274 homemakers who had not put up the gas plants are given in Table L.

TABLE L

REASONS FOR NON-ADOPTION

S.No.	Reasons	Percentage* (N=274)
1.	Not aware of its importance	79
2.	Lack of space	74
3.	Lack of adequate cow dung	71
4.	Money constraints	69
5.	Dissatisfying experience of users	61
6.	Not interested	60
7.	Not convinced of its benefits	59

* Multiple responses

It is clear from the table that 79 per cent out of 274 homemakers had not put up biogas plants as they were not aware of its importance whereas 69 per cent had stated that

due to money constraints, while 59 per cent were not convinced of its benefits.

4. Mud storage device

In rural areas, the homemakers were purchasing the vegetables once in a week and were spending more time on transportation to purchase the vegetables. In order to conserve their time and money and to keep the vegetables in good condition, action programme for imparting education on cheap cost storage device was given through demonstration and discussion to the homemakers and they were motivated to use the mud storage device in their homes.

Out of 300 households to whom education on mud storage device was imparted, 178 households had adopted and were using the simple device to preserve perishable items at home levels.

The device was used for storing vegetables, batter, curd etc. The mud plate provided in the device was used for keeping the vegetables and fruits.

i) Items stored

Table LI shows the different items stored in the mud storage devices as given by the 178 homemakers.

TABLE LI

ITEMS STORED IN MUD STORAGE DEVICE

S.No.	Items	Percentage* (N=178)
1.	Curry leaves	100
2.	Corriander leaves	100
3.	Greens	100
4.	Carrot	94
5.	Tomato	94
6.	Green chillies	85
7.	Ladies finger	83
8.	Beans	82
9.	Curd	63
10.	Batter	51

* Multiple responses

The table clearly indicates that all the homemakers had stated that they had been using the device for storing curry leaves, corriander leaves and greens whereas 94 per cent were storing carrot and tomato, while only 63 per cent and 51 per cent were using this device for storing curd and batter respectively.

The efficacy of the storage device for preserving the vegetables and other items like curd and batter was appreciated by all the homemakers.

ii) Advantages of using mud storage device

Table LII depicts the advantages of using the mud storage device as expressed by the homemakers.

TABLE LII

ADVANTAGES OF USING MUD STORAGE DEVICE

S.No.	Advantages	Percentage* (N=178)
1.	Keeps vegetables fresh	86
2.	Prevents nutrient losses	85
3.	Saves money	84
4.	Conserves time (Marketing)	81
5.	Saves energy	80
6.	Multipurpose device	74
7.	Minimises the fermentation of batter and curd	72
8.	Hygienic and cheap way to preserve vegetables and fruits	70

* Multiple responses

It is evident from the table that 86 per cent had stated that it keeps vegetables fresh and 85 per cent had said that it prevents nutrient losses while 70 per cent had viewed that it is a hygienic and cheap way to preserve vegetables and fruits.

iii) Evaluating the quality of items

The vegetables and batter stored in the device were tested at the end of each day. The items stored in the devices were tested on their freshness and longivity for a period of seven days under three categories viz., Good, Fair and Poor in terms of appearance, colour, texture and taste. Freshness and longivity of the vegetables for a period of seven days as given by the percentage of homemakers are presented in Table LIII.

TABLE LIII

FRESHNESS AND LONGIVITY OF THE VEGETABLES FOR A PERIOD OF SEVEN DAYS

S.No.	Items	Test	I Day			II Day			III Day			IV Day			V Day			VI Day			VII Day		
			G	F	P	G	F	P	G	F	P	G	F	P	G	F	P	G	F	P	G	F	P
1.	Curry leaves	Appearance	90	10	-	85	10	5	80	15	5	75	15	10	75	15	10	60	25	15	50	15	35
		Colour	90	10	-	85	10	5	80	15	5	75	15	10	75	15	10	60	25	15	50	15	35
		Texture	90	10	-	85	10	5	80	15	5	75	15	10	75	15	10	60	25	15	50	15	35
		Taste	90	10	-	85	10	5	80	15	5	75	15	10	75	15	10	60	25	15	50	15	35
2.	Corriander leaves	Appearance	90	10	-	85	10	5	80	15	5	75	15	10	75	15	10	60	25	15	50	15	35
		Colour	90	10	-	85	10	5	80	15	5	75	15	10	75	15	10	60	25	15	50	15	35
		Texture	90	10	-	85	10	5	80	15	5	75	15	10	75	15	10	60	25	15	50	15	35
		Taste	90	10	-	85	10	5	80	15	5	75	15	10	75	15	10	60	25	15	50	15	35
3.	Greens	Appearance	90	10	-	90	10	-	85	10	5	80	15	5	75	15	10	65	25	15	55	20	25
		Colour	90	10	-	90	10	-	85	10	5	80	15	5	75	15	10	65	25	15	55	20	25
		Texture	90	10	-	90	10	-	85	10	5	80	15	5	75	15	10	65	25	15	55	20	25
		Taste	90	10	-	90	10	-	85	10	5	80	15	5	75	15	10	65	25	15	55	20	25
4.	Carrot	Appearance	100	-	-	100	-	-	100	-	-	90	10	-	85	10	5	75	15	10	70	10	20
		Colour	100	-	-	100	-	-	100	-	-	90	10	-	85	10	5	75	15	10	70	10	20
		Texture	100	-	-	100	-	-	100	-	-	90	10	-	85	10	5	75	15	10	70	10	20
		Taste	100	-	-	100	-	-	100	-	-	90	10	-	85	10	5	75	15	10	70	10	20
5.	Tomato	Appearance	100	-	-	100	-	-	90	10	-	85	10	5	80	10	10	70	15	15	65	10	25
		Colour	100	-	-	100	-	-	90	10	-	85	10	5	80	10	10	70	15	15	65	10	25
		Texture	100	-	-	100	-	-	90	10	-	85	10	5	80	10	10	70	15	15	65	10	25
		Taste	100	-	-	100	-	-	90	10	-	85	10	5	80	10	10	70	15	15	65	10	25
6.	Green chillies	Appearance	100	-	-	100	-	-	85	15	-	80	15	5	75	15	10	65	10	25	60	10	30
		Colour	100	-	-	100	-	-	85	15	-	80	15	5	75	15	10	65	10	25	60	10	30
		Texture	100	-	-	100	-	-	85	15	-	80	15	5	75	15	10	65	10	25	60	10	30
		Taste	100	-	-	100	-	-	85	15	-	80	15	5	75	15	10	65	10	25	60	10	30
7.	Ladies finger	Appearance	100	-	-	100	-	-	90	10	-	80	10	10	75	15	10	65	10	25	25	15	60
		Colour	100	-	-	100	-	-	90	10	-	80	10	10	75	15	10	65	10	25	25	15	60
		Texture	100	-	-	100	-	-	90	10	-	80	10	10	75	15	10	65	10	25	25	15	60
		Taste	100	-	-	100	-	-	90	10	-	80	10	10	75	15	10	65	10	25	25	15	60

G - Good ; F - Fair ; P - Poor

The table clearly gives a detailed account of the utility and longivity of the mud storage device for keeping the vegetables afresh over a period of seven days in terms of appearance, colour, texture and taste.

The figures in the table give a substantial proof as to why the homemakers were fully satisfied with the cheap simple device for preserving vegetables. The table shows that all the vegetables kept in the mud storage device were fresh till the fifth day.

ii) **Reasons for non-adoption**

Out of 300 households, 122 households were not using the mud storage device and the reasons as expressed by them for its non-adoption were : 85 per cent of respondents had stated lack of money, 72 per cent had no interest and time, for 70 per cent it was heavy in weight and breakable and 59 per cent had viewed that it occupies more space and 40 per cent had stated that lack of time to change water and to look after its maintenance.

7. **Views on the adopted technologies**

The views on all the adopted technologies as given by the homemakers are discussed under the following headings :

a. Problems in the adoption of the technologies,

b. Effectiveness of the technologies,

c. Improvement in the standard of living and

d. Benefits acquired by adoption of technologies.

a. Problems in the adoption of the technologies

The respondents were faced with many problems in adoption. The problems expressed by the homemakers are depicted in the Table LIV.

TABLE LIV

PROBLEMS IN THE ADOPTION

S.No.	Problems	Percentage (N=300)
1.	Traditional values and taboos	40
2.	Lack of awareness	31
3.	Lack of time	30
4.	Lack of knowledge regarding management and maintenance	30
5.	Lack of money	29
6.	Lack of interest	29
7.	Lack of skill	28

The main problem in the transfer of technology was traditional values and taboos (40 per cent) which stood in the way of change, followed by lack of awareness (31 per cent) whereas only 28 per cent had stated that the reason was lack of skill (Figure 3).

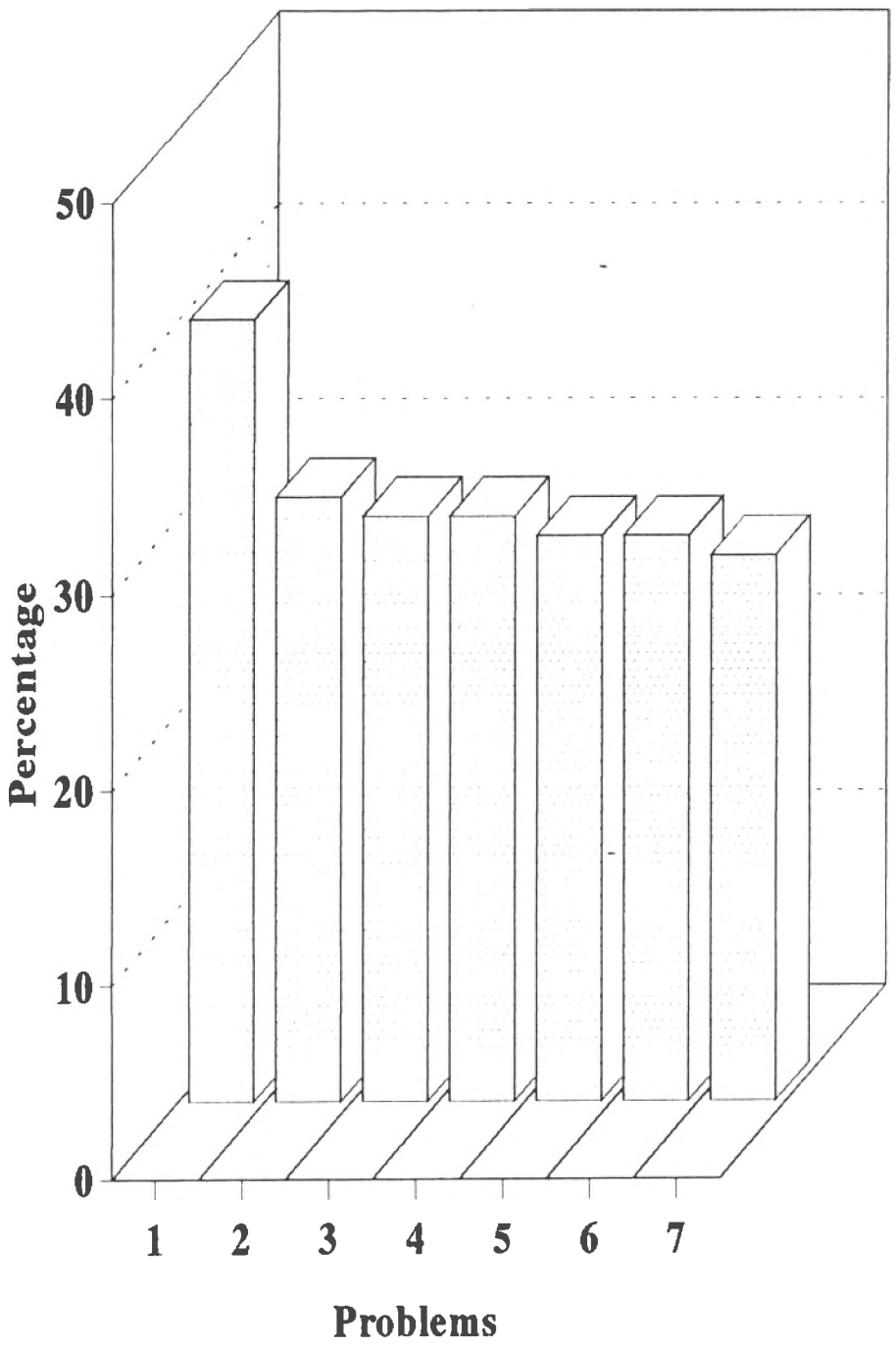

Figure 3. PROBLEMS IN THE ADOPTION

1. *Traditional values and taboos*
2. *Lack of awareness*
3. *Lack of time*
4. *Lack of knowledge regarding maintenance*
5. *Lack of money*
6. *Lack of interest*
7. *Lack of skill*

b. Effectiveness of the technologies

After education and adoption of the technologies, effectiveness was tested to find out the effectiveness of the technologies adopted by the homemakers.

Effectiveness of the technologies with regard to their utilization at their household levels are presented in the Table LV.

TABLE LV

EFFECTIVENESS OF THE TECHNOLOGIES

S.No.	Criteria	Percentage		
		Good	Fair	Poor
1.	Easy to store	95	5	-
2.	Easy to handle	95	5	-
3.	Easy to clean	85	15	-
4.	Easy to maintain	80	15	5
5.	Convenient shape	80	15	5
6.	Adequate size	80	15	5
7.	Comfortable height	75	15	5
8.	Easy to fabricate at household level	70	15	15
9.	Easy mobility	60	25	15
10.	Low cost	60	20	20
11.	Durability of material used for construction	50	25	25

more then

The table shows that three fourths of the homemakers who had adopted the technologies had expressed their views as good. From this we can conclude that a large majority of the homemakers were satisfied with the technologies with regard to its maintenance, convenient shape, storage, handling, cleaning and size.

c. Improvement in the standard of living

The homemakers who had adopted the household technologies were fully satisfied and had stated that their standard of living had definitely improved because of the beneficial advantages they had acquired as a result of using the technologies. Any improvement in the quality of life had to start from the home and eventually it was the woman, who uplifts the standard of living of the family.

Table LVI gives a very clear picture of the different advantages acquired to the beneficiaries as a result of using the technologies.

TABLE LVI

ADVANTAGES ACQUIRED

S.No.	Improvement	Percentage
1.	Reduced soot on vessels and walls	89
2.	Saving of time (Cleaning utensils and food preparation)	88
3.	Saving of fuel (consume less fuel)	87
4.	Clean cooking area	86
5.	Smokeless work area	85
6.	No burning of eyes	82
7.	Healthy environment	81
8.	No coughing	80
9.	Reduction in drudgery	80
10.	Getting fresh vegetables	77
11.	Minimises the labour	77
12.	Conserves money	76
13.	No breathing problem	75
14.	Improves health condition	74
15.	Lends for the use of all types of fuel	72
16.	Convenience	71
17.	Getting more leisure time	70
18.	Reduces fire hazards	62

A large majority (89 per cent) had felt that using a smokeless chulah had reduced soot on vessels and walls, followed by saving of time (88 per cent), saving fuel (87

per cent), clean cooking area (86 per cent), smokeless work area (85 per cent), healthy environment (81 per cent) reduction in drudgery (80 per cent) and getting more leisure time (70 per cent).

It can be concluded that the use of these technologies had improved the standard of living because they were relieved from drudgery, saved time, energy and money and could use the savings for various other useful activities.

d. Benefits of Household Technologies

Table LVII explains the benefits acquired by the homemakers by adopting the household technologies.

TABLE LVII

BENEFITS ACQUIRED BY ADOPTION OF TECHNOLOGIES

S. No.	Technologies	Percentage																			
		Time saving			Fuel saving			Money saving			Drudgery reduction			Convenience			Environment cleanliness			Health Improvement		
		0 to 10 %	11 to 20 %	21 and above %	0 to 10 %	11 to 20 %	21 and above %	0 to 10 %	11 to 20 %	21 and above %	0 to 10 %	11 to 20 %	21 and above %	0 to 10 %	11 to 20 %	21 and above %	0 to 10 %	11 to 20 %	21 and above %	0 to 10 %	11 to 20 %	21 and above %
1.	Smokeless chulah	19	60	21	22	34	54	6	34	61	-	21	79	5	30	65	-	17	83	5	15	80
2.	Hay box	80	15	5	31	59	10	25	55	20	18	69	13	16	73	11	40	56	4	43	45	2
3.	Bio-gas	20	70	70	20	30	50	10	30	60	20	60	20	18	56	26	20	65	15	10	15	75
4.	Mud storage device	20	70	10	-	-	-	41	55	4	55	35	10	65	30	5	80	20	-	45	-	-
5.	Mud water filter	20	-	-	-	-	-	-	-	-	69	25	6	75	20	5	20	75	5	-	15	85
6.	Kitchen gardening	70	20	10	-	-	-	20	40	40	20	40	40	30	30	40	10	59	31	15	60	25
7.	Soak pit	-	-	-	-	-	-	-	-	-	20	30	50	10	40	50	20	20	60	10	20	70
8.	Sanitary latrine	-	-	-	-	-	-	-	-	-	40	40	20	40	40	20	20	30	50	10	30	60

The Smokeless chulah, biogas and hay box were considered as fuel saving devices by many of the homemakers and were also considered as drudgery reducing and creating good environmental cleanliness by the homemakers who were using these devices. The Mud storage device was considered as time and money saving device because it had reduced the marketing time and avoided spoilage of vegetables. Using the mud water filter, soak pit and sanitary latrine were considered as health improvement technologies because of using these devices one can be free from communicable diseases.

This indicates that different technologies did offer different benefits to the homemakers. The tasks which were earlier considered as tiring and tedious were no longer so as the introduction of the new household technologies not only reduced the drudgery of work but also offered the homemakers more convenient way to do the work. These technologies were offering environmental cleanliness and saved time and fuel. They no longer had to perform cooking in uncongenial atmosphere which could prove detrimental to their health.

Use of low cost modern devices did also go a long way to change the life style of the respondents; it decreased the work load, increased the leisure time and reduced the drudgery of work.

Influence of selected variables on the adoption of the low cost technologies

The influence of the selected variables, namely, age, education, occupation, income and family size of the homemakers on the adoption of the different low cost technologies were analysed statistically using chi-square test and presented in Table LVIII.

TABLE LVIII

INFLUENCE OF SELECTED VARIABLES ON THE ADOPTION OF THE LOW COST TECHNOLOGIES

S.No.	Variables	Chi-square test - 0.05	
		Calculated value	Table value
1.	Age	12	21.0
2.	Education	20	31.4
3.	Occupation	20	31.4
4.	Income	8	15.5
5.	Family size	8	15.5

The above table reveals that the age, education, occupation, income and family size of the homemakers, the calculated chi-square values are much lower than the table values (0.05 level) inferring that there is no significance between the above said variables and adoption. The present study reveals that the variables such as age, education, occupation, income and family size are not significant factors in the adoption process among the homemakers.

Summary and Conclusion

V. SUMMARY AND CONCLUSION

The study on the "Impact of education on conservation of household resources by rural families" was designed to find out as to how far the rural homemakers had utilized the low cost labour saving technologies to reduce their drudgeries in order to conserve time, money and fuel because of the education given to them and improve their quality of life.

Three hundred homemakers at the rate of 100 were selected from Kovanur, Palanigoundenputhur and Mathampalayam villages of Coimbatore district using simple random sampling method. The method of study used was survey and action programme and information was collected through interview schedule.

The findings are summarised below :

Family background

Out of 300 homemakers, 45 per cent belonged to middle age group (36-45 years).

Forty two per cent of homemakers were illiterates. Professional qualification was found only among a meagre 3 per cent among the homemakers.

A majority (77 per cent) of the families belonged to nuclear family and 60 per cent belonged to medium size (4 to 6 members) and there were 10 per cent large (7 and above members) families. Sixty five per cent of the homemakers had owned houses.

A majority of 64 per cent belonged to the monthly income group of Rs. 2,500 and below and 13 per cent were earning above Rs. 5001per month. The average monthly income of the selected families was Rs. 2,389.

Out of 300 families, only 177 families had owned lands. The average land holding of the families was 2.43 acres. Only 40 households out of 300 families were having cattle.

Existing Practice of the Households

All the families taken for the study were using firewood as fuel for preparing foods. Saw dust and paper waste were the other fuels used by 12 and 10 per cent of the families respectively.

Fifty per cent and 34 per cent of homemakers and heads of the families were responsible for the procurement of fuel and all the families were storing the firewood just outside their houses.

Eighty two per cent of the homemakers had expressed that while using the traditional chulah, the soot deposition

were there on the utensils and 39 per cent were of the view that the durability of the traditional chulah was poor.

There was no proper drainage in the houses of the homemakers taken for the study, 89 per cent faced the problems of foul odour emanating from stagnated waste water which lead to breeding of mosquitoes. There were no latrines in the individual houses and the public latrines and conveniences were filthy without proper maintenance.

Forty per cent of the rural households were not using the common toilets and only 29 per cent were using common toilets available in the village.

Fifty two per cent of the families were utilizing open field for nature's call.

Thirty two per cent of the sample had stated that unhygienic surrounding due to open field defecation was the problem faced by them and 18 per cent had pointed out the lack of privacy.

Out of 300 samples, 237 homemakers had expressed that they had felt fatigue due to the household activities.

Sixty one per cent of the homemakers had expressed that collecting fuel was more fatigue causing and 59 per cent collecting water. Fifty seven per cent had complained

fatigue after the daily heavy work in the home. Forty two per cent of homemakers had felt fatigue because of doing tasks continuously without diversion or rest while ten per cent had given the reason for fatigue as "less interesting work" and another ten per cent "doing things hurriedly".

Forty one per cent of homemakers had expressed back pain as the main symptom of physiological fatigue followed by other symptom like pain in the limbs (4 per cent).

Boredom (31 per cent) and exhaustion (18 per cent) were the psychological fatigue that they had experienced.

Twenty four per cent of the households had possessed pressure cooker, only 6 per cent of them had refrigerators.

Impact of the action programme

Education was imparted on the smokeless chulah, hay box, biogas, mud water filter, mud storage device, kitchen garden, soak pit and sanitary latrine.

After imparting education, a large majority of them (92 per cent) became aware of the smokeless chulah, 91 per cent of the homemakers became aware of kitchen gardening after creating awareness to that of 32 per cent before education. Eight per cent were aware of mud storage devices before education but 86 per cent became aware of it after education

and only a few knew about mud water filter (18 per cent) and hay box (9 per cent) earlier but the education given to the homemakers helped 86 per cent to become aware of both appliances- mud water filter and hay box. Before education only 10 per cent knew about soak pit but after education 78 per cent became aware of it.

Eighty nine per cent of homemakers had felt that using labour saving devices would help to overcome fatigue and 47 per cent had viewed that taking rest in between work would relieve them from fatigue.

After education the knowledge level with regard to the smokeless chulah of the homemakers got high scores (62 per cent) followed by average (30 per cent) and low level (8 per cent).

Seventy per cent of the homemakers had good (favourable) opinion towards smokeless chulah followed by 18 per cent poor and 12 per cent fair opinion for it.

Seventy five per cent had fair opinion towards pressure cooker, followed by those who had poor and good opinion towards pressure cookers.

After education, 73 per cent had raised kitchen garden in the yards, 70 per cent had adopted smokeless chulah in their kitchen, while 9 per cent had adopted the biogas. The

reasons for selection of low cost technologies by 88 per cent of the homemakers had revealed that they could conserve fuel, while 68 per cent had stated that they could get more leisure time.

Boiling was the common water purification method adopted by majority (83 per cent) of the homemakers, only five per cent purified by chlorination method.

To conserve water, 87 per cent of the households were harvesting rain water during rainy season whereas 70 per cent were closing the water tap after use.

Out of 192 homemakers who were using mud water filter, a large majority of them (96 per cent) had stated that it helped to get safe drinking water and 60 per cent had said that it was cheap.

After imparting education on waste water disposal to the homemakers, a majority (69 per cent) of the homemakers were diverting the waste water to the kitchen garden against 32 per cent before education.

After education, a large majority (85 per cent) of the homemakers reused the waste water for various household activities like washing the bathroom, cleaning the gutters, sprinkling water in the front yard and for kitchen gardening.

Thirty three homemakers had constructed the soak pit. The advantages of soakpit as expressed by the 33 homemakers who had put soak pits in their yards, 85 per cent had stated that soak pit enhances aesthetic surroundings and 60 per cent had viewed that it occupies less space.

The two hundred and sixty seven homemakers who had not put up soak pits in their houses had given various constraints for non-adoption like economic, technological, operational, psychological and socio-cultural with various degree of seriousness.

Among three hundred homemakers, after education 145 of homemakers were persuaded to construct low cost cheap latrines in their houses.

The homemakers were spending on an average 5 hours and 40 minutes for cooking before education but after education they were doing cooking within 5 hours and 25 minutes by using low cost technologies and thus saving 15 minutes which they used for personal care.

After education, the time saving techniques adopted by the homemakers i.e., 82 per cent using labour saving devices like hay box, bio-gas, smokeless chulah and mud storage devices had conserved time, while 59 per cent had provided sufficient time to do each task satisfactorily.

Eighty four per cent had stated that the time so conserved as a result of adopting new household technologies provided mental rest and satisfaction, while 66 per cent were utilizing the time thus saved for taking care of personal and family health.

The money management practices of the selected families revealed that earlier most of them (90 per cent) had never planned their family income. After imparting education, it was found that 75 per cent of families had developed the habit of planning their budget by keeping daily accounts.

Before education, homemakers were spending on an average 48 per cent of their total income on food but after imparting education they were spending only 38.00 per cent for food, thus saving 10 per cent of their income.

After education,66 per cent of the homemakers had cut down their unnecessary expenditure by controlling family expenditure and 93 per cent had developed the habit of saving the money. Before education all the homemakers were using traditional chulahs for cooking and smokeless chulah (18 per cent) and gas stove (19 per cent) were used only by a few households. After education, 64 per cent began to use smokeless chulah and 31 per cent gas stove and 68 per cent had practised the habit of cleaning their chulah daily

compared to 10 per cent before education and only two per cent were cleaning occasionally.

All the 209 homemakers who were using smokeless chulah had reported that it saves time and eliminates smoke ... from kitchen.

Seventy six per cent of them had always made use of front dampers and one per cent had never used back dampers of the chulah.

Thirty eight per cent of the homemakers had pointed out "defective construction" as the main reason for non-adoption of the chulah and 12 per cent had stated it was due to lack of awareness about smokeless chulah.

Eight per cent of the families used to procure fuel weekly before education, but it increased to 31 per cent after education. A meagre twoper cent were procuring fuel every month before education, but after education it had risen to 28 per cent.

After education, all the homemakers had stated that they were preplanning and keeping items within their reach in advance before lighting the flame to conserve fuel and only 37 per cent of households were using hot case to avoid reheating and wastage of fuel.

The homemakers (199) had prepared several items using the hay box. All the homemakers had expressed satisfaction about the use of hay box in preparing rice, pongal and tomato rice which were the normal food preparations that they were normally taking and had remarked that rice cooked by using hay box was found to be superior in quality with respect to tenderness, doneness, colour and taste. The green gram sundal prepared by using hay box was not upto their satisfaction like other food items. All the homemakers who were using hay box had viewed that the device helped them to save time, fuel and reduced labour and 30 per cent had stated that reheating of the prepared food was not needed while using the hay box. The temperature of rice cooked and kept in the hay box retained at 61^{o}C temperature for five to six hours while the temperature of rice kept outside for the same period had come down to 35^{o}C.

One hundred and one homemakers had not adopted the hay box because of the non-availability of hay (74 per cent) while 39 per cent had stated that they were not aware of its importance.

Only 26 homemakers had adopted the biogas plant since it involved high cost, possession of cattles, availability of space and other related things. Ninety per cent out of 26 homemakers had stated that biogas makes cooking easy, while

9 per cent had stated that it helps in recycling waste respectively.

Even though 26 homemakers had put up the biogas plants and to some extent satisfied with it, they had encountered certain problems. Twenty five per cent each had stated that they were not getting sufficient gas for cooking and construction was not good.

Seventy nine per cent out of 274 homemakers had not put up biogas plants as they were not aware of its importance, while 59 per cent were not convinced of its benefits.

One hundred and seventy eight households had adopted mud storage device and were using the simple device (mud storage device) to preserve perishable items at home.

All the homemakers had stated that they had been using the device (mud storage device) for storing curry leaves, corriander leaves and greens, 63 per cent and 51 per cent were using this device for storing curd and batter respectively.

The advantages of using the mud storage device as expressed by the homemakers were that 86 per cent had stated that it keeps vegetables fresh while 70 per cent had viewed that it is a hygienic and cheap way to preserve vegetables and fruits.

The items stored in the device were tested for their freshness and longivity for a period of seven days under three categories viz., Good, fair and poor in terms of appearance, colour, texture and taste. All the vegetables kept in the mud storage device were fresh till the fifth day.

One hundred and twenty two households were not using the mud storage device and the reasons as expressed by them for its non-adoption were that 85 per cent of respondents had stated that lack of money while 40 per cent had stated that lack of time to change water and to look after its maintenance.

The knowledge, opinion and adoption are interrelated. People will not accept any programme if they do not have the knowledge about it or favourable opinion towards it.

The respondents had faced many problems in adoption of household technologies. The main problems in the transfer of technology was traditional values and taboos (40 per cent) which stood in the way of change, whereas only 28 per cent had stated that the reason was lack of skill.

After education and adoption of the technologies, effectiveness was tested to find out the usefulness of the technologies adopted by the homemakers. More than three fourths of the

homemakers who had adopted the technologies had expressed their views as useful and good.

The homemakers who had adopted the household technologies were fully satisfied and had stated that their standard of living had definitely improved. The improvement in the standard of living as a result of the usage of the technologies were that a large majority (89 per cent) had felt that using smokeless chulah had reduced soot on vessels and walls and (62 per cent) reduced fire hazards.

Benefits acquired by the adoption of technologies were: Smokeless chulah, biogas and hay box were considered as fuel saving devices by many of the homemakers and were also considered as drudgery reducing and creating good environmental cleanliness by the homemakers who were using these devices. Mud storage device was considered as time and money saving device because it had reduced the marketing time and avoided spoilage of vegetables. Using mud water filter, soak pit and sanitary latrine were considered as health improvement technologies because of using these devices one can be free from communicable diseases.

The tasks which were earlier considered as tiring and tedious were no longer so as the adoption of the new household technologies in their household activities not only reduced the drudgery of work but also offered the

homemakers a more convenient way to do work. These technologies were offering environmental cleanliness and saved time and fuel. They no longer had to perform cooking in uncongenial atmosphere which could prove detrimental to their health.

The study reveals that the variables such as age, education, occupation, income and family size are not significant factors in the adoption process among the homemakers.

The following recommendations emerge out of the study :

1. Appropriate messages and materials are to be designed with the help of the target audience and suitable channels of communication for imparting education by the government.
2. Educational programmes should be organised and conducted and follow-up study could enable us to increase awareness among the people.
3. Local community participation in assessing needs by means of a dialogue with the public authorities and groups concerned in society is a first essential stage in broadening access to education and improving its quality. When communities assume greater responsibility for their own development, they learn to appreciate the role of education both in achieving

societal objectives and in improving the quality of life.

4. Education should enable people to develop awareness of themselves and their environment and encourage full participation in work and society.
5. Cheap low cost household technologies should be supplied to the poor families in rural areas by the Block Development Office at concessional rates.

We live in an age when all facets of social life are in a state of rapid change. By the year 2000 A.D., society would surely have changed beyond recognition. In this context of rapid changes, education has the dual responsibility of being the instrument of change and of fitting people to the new culture and patterns of living. New technologies are emerging. The new technologies will cover the entire array of human activities. We have become keenly aware of the need to tackle poverty to redress social injustice, to ameliorate the living conditions of the masses and to improve the quality of life of millions of people. Equally important is a global awareness that is now emerging: the responsibility to conserve the world's resources and preserve the ecology.

Japanese Poet, YOSANO AKIKO has said :

"The mountain moving day is coming
I say so, yet others doubt
Only a while the mountain sleeps.
In the past
All mountains moved in fire,
Yet you may not believe it.
Oh man, this alone believe
All sleeping women now will awake and move".

Since one of the central objectives of the Community Development programme is to create a new outlook among the villagers, social education acquires considerable importance. The village people must first become conscious of the deficiencies of the present practices and want to develop a positive approach towards the creation of new values and aspirations and awareness of new ways of living. Social education could create new perspectives in the minds of rural people, engender a desire for improved ways of living using the low cost technologies and help them in achieving their goals. The extension workers and those who are involved in carrying out social service play an important role, by helping in changing the attitudes of developing knowledge and skills of the people and finally developing rural leadership especially among women.

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Appendices

APPENDIX I

INTERVIEW SCHEDULE TO ELICIT INFORMATION REGARDING HOUSEHOLD RESOURCE MANAGEMENT PRACTICES OF RURAL FAMILIES

1. ***Name of the Interviewee :***

   Name of the head of the Family :

   Type of Family : Nuclear |____|

   Joint |____|

2. ***Family Background***

S.No.	*Name of the family members*	*Relationship*	*Age*	*Education*	*Occupation*	*Income per month*

3. *Do you own a house ?* *Yes* *No*

   If yes, mention the type of house

   Tile |____| *Terrace* |____| *Thatched* |____|

4. *Do you possess land ?* *Yes* *No*

   If yes how many acres ?

   0.5 - 2.5 |____|

   2.6 - 5 |____|

   5.1 - 7.5 |____|

   5.1 - 7.5 |____|

5. *Do you have milch animal ?* *Yes* *No*

   If yes, how many ?

6. *Fuel Management : Storage of Fuels*

S.No.	Name of the fuel	Place of storage	Method of storing Rainy season	Method of storing other season	Problems in storing	Steps taken to control pest

B. *Information on fuels*

S. No.	Name of the fuel	Source of collection Own farm	Source of collection Neigbourhood	Quantity	Cost in Rs.	Person responsible for collection	Distance travelled	Time taken in mts.
1.	Firewood							
2.	Barks & Twigs							
3.	Agro waste							
4.	Coconut shell and fibre							
5.	Dungcake							
6.	Saw dust							
7.	Dried palm leaf							
8.	Paper waste							

C. Problems faced while using traditional Chulah

i. Scarcity
ii. Excess fuel consumption
iii. High cost
iv. Consumes more time in cooking
v. Soot deposition on the utensils
vi. Burning sensation of eye
vii. Difficult to clean the utensils
viii. Difficult to make or light fire
ix. Not durable
x. Slow warming up
xi. Drives away the children outside due to smoke
xii. Spoils health condition of homemaker
xiii. Heat not supplied to the first seat

7a. Do you have latrine in your house ? *Yes* *No*

If no, where do you go for nature's call ?

b. What are the problems faced while using open field defecation ?

i. Unhygienic surroundings
ii. Cannot use during day time
iii. Emanates bad and nasty smell
iv. Cannot go out during rainy season
v. Long distance
vi. Lack of privacy

c. Do you have common toilet in your village ? *Yes* *No*

If yes, are you using it ?

d. If no, give the reason ?

e. Open field defecation problem

8. Information regarding fatigue

a. Do you experience fatigue ? *Yes* *No*

If yes, mention the fatigue causing activities ?

b. Why should you feel fatigue ?

c. *List the reasons for feeling fatigue ?*

a. Working continuously without diversion or recreation
b. Performing under emotional stress
c. Working amidst many activities
d. Difficult to perform
e. A routine monotonous job
f. Less interesting work
g. Doing things hurriedly

d. *Mention the symptoms of fatigue experienced by you ?*

i. Physiological Fatigue

Back ache
Head ache
Neck pain
Giddiness
Palpitation
Pain in the limbs

ii. Psychological Fatigue

Boredom
Frustration
Depression
Exhaustion

9. *Details about the labour saving devices*

a. *Do you have labour saving devices at your home ?* *Yes* *No*

If yes, list the names of labour saving devices

b. *Are you aware of various labour saving devices ?* *Yes* *No*

If yes, mention the names ?

c. *What factors do you think will remove your fatigue at home ?*

i. Using labour saving devices
ii. Sharing the household work
iii. Organising work in an orderly way
iv. Improving work area
v. Performing work when fresh and alert
vi. Taking rest in between work

d. Give the reason for the adoption of low cost labour saving devices

i. Conserves fuel
ii. Maintains kitchen neatly
iii. Minimizes time
iv. Makes kitchen work enjoyable
v. Saves money
vi. Gives status
vii. Relief from hazard
viii. Saves labour
ix. Helps to get more leisure time

e. What are the devices you use/practise ?

10. Water management

a. Are you treating drinking water ? Yes No

If yes, which methods are used for treating drinking water ?

i. Boiling and filtering
ii. Straining through cloth
iii. Filtering through candle filter
iv. Alum
v. Alkali
vi. Chlorination

b. What steps have you taken to conserve water ?

i. Harvesting rain water (cooking dhal, bathing, cleaning and washing)
ii. Reuse of waste water (sprinkling the front yard, washing and cleaning the bathroom and toilet)
iii. Cleaning the vessels at one time
iv. Using limited quantity of water
v. Close the tap after use
vi. Washing the clothes near the water source

c. List the advantages of using mud water filter ?

d. Do you have proper drainage facilities ? Yes No

If yes, what type of facilities you have ?

Connected to mainsewer
Open gutters
Diverted for raising kitchen garden

e. *Do you use waste water for the following activities ?*

i. *Raising kitchen garden*
ii. *Sprinkling water in the front yard*
iii. *Washing open gutters in house*
iv. *Cleaning the background*
v. *Any other*

f. *List the problems faced in the waste water disposal ?*

i. *Foul odour*
ii. *Breeding of mosquitoes*
iii. *Non-availability of common sewer*
iv. *No place for raising kitchen garden*

g. *Do you have space for raising kitchen garden ?* *Yes* *No*

h. *Have you raised a kitchen garden ?* *Yes* *No*

i. *What are the items grown in your home garden ?*

ja. *List the benefits of having a kitchen garden at your home ?*

i. *Prevents stagnation of water*
ii. *Provides good environment*
iii. *Avoids filthy appearance*
iv. *Getting fresh vegetables*
v. *Enhances aesthetic surrounding*
vi. *Provides neat and clean surroundings*
vii. *Minimizes health hazards*
viii. *Improves the plant growth and yield*
ix. *Enables reuse of waste water*

jb. *If no, give the reason for not raising the kitchen garden ?*

i. *Lack of space*
ii. *Lack of time*
iii. *Lack of interest*
iv. *Limitations of technical know-how*

k. *Have you constructed soak pit in your house ?* *Yes* *No*

I. *If yes, give the advantages of having soak pit at home ?*

i. *Enhances aesthetic surroundings*
ii. *Arrests breeding of mosquitoes and flies*
iii. *Minimizes health hazards*
iv. *Prevents water stagnation*
v. *Healthier way to dispose sullage water*
vi. *Prevents environmental pollution*

vii. Absorbs the waste water well
viii. Provides healthy surroundings
ix. Easy to remove the suspended and settleable particles
x. Requires simple skill and technology

m. If no, give the reason for non-adoption_

n. What are all the ways to keep toilet clean ?

11. Time management

a. Mention the time management practices followed for the household activities

S.No.	Activities	Time spent in mts
1.	Stocking of fuel	
2.	Preparation and cooking of food	
3.	Serving of food	
4.	Cleaning utensils	
5.	Cleaning of home	
6.	Sweeping	
7.	Washing clothes	
8.	Child care	
9.	Personal care	
10.	Live stock care	
11.	Purchase of groceries	
12.	Fetching water	
13.	Care of sick	
14.	Travel	

b. List the time saving techniques followed by you ?

i. Use of labour saving devices
ii. Plan time saving through clubbing related activities wherever possible
iii. Give priority to important tasks
iv. Distribute tasks among family members
v. Arrange work in sequence
vi. Make the household activity plan flexible
vii. Set apart some time for personal and recreational activities as well as for family members
viii. Provide sufficient time to do each task satisfactorily

c. Give the benefits of time conserved by adopting low cost technologies ?

i. Having mental rest and satisfaction
ii. Getting physical rest and relaxation
iii. Getting adequate time to do home making activities
iv. Foresting family well being and happiness
v. Taking care of family members
vi. Having time for recreational activities
vii. Taking care of personal and family health

12. Money management

a. Do you plan your financial dealings ? Yes No

b. Do you maintain regular budget ? Yes No

If yes, how do you maintain ?

c. Give your household expenditure pattern

S.No.	Items	Average Expenditure in percentage
1.	Food	
2.	Clothing	
3.	Shelter	
4.	Fuel	
5.	Education	
6.	Health	
7.	Transport	
8.	Recreation	
9.	Celebration of Festivals	
10.	Maintenance like white washing, painting and other repairs	
11.	Savings	

d. How do you control your family expenditure ?

By borrowing less money
cutting down unnecessary expenditure
postponing the less important items of expenditure

e. Do you have saving habits Yes No

If yes, mention the method of saving

post office |____| local chits |____| Banks |____|

Finance Investment companies |____|

13. *Fuel Management*

a. *List the type of stove used by you ?*

Traditional chulah
Smokeless chulah
Kerosene stove
Gas stove

b. *Are you regularly cleaning the chulah ?* *Yes* *No*

If yes, mention

Daily
Weekly
Monthly
Occasionally

c. *Mention the frequency of procurement of fuel ?*

Daily
Alternate days
Weekly
Fortnightly
Monthly

d. *Do you adopt fuel conservation techniques ?* *Yes* *No*

If yes, what are they ?

Preplanning and keeping everything ready,
reducing the flame at appropriate time
using proper size of utensils
using aluminium utensils for cooking
keep enough quantity of water for cooking
minimising use of fuel
soak pulses one hour before cooking
utilizing effective heat available in chulah
restricting the number of times on meals preparations
using hay box
using pressure cooker
using hot case

e. *List the benefits acquired by using smokeless chulah ?*

Eliminates smoke from kitchen
Saves time
Gives soot free utensils
Economices fuel use
Transmits heat evenly
Lends for the use of all types of fuel
Simple technology
Reduces health problems
Suitable for daily cooking
Cheaper cost of construction
Lessens drudgery in cooking
Easy handling and maintenance

f. *Extent of utilization*

S.No.	Practise	Always	Occasionally	Never
1.	How often do you make use of front dampers ?			
2.	How often do you make use of back dampers ?			
3.	How often do you keep the cooked food hot according to the need ?			
4.	How often do you clean the chimney ?			
5.	How often do you repair your chulah ?			

G. *Give reasons for non-adoption of smokeless chulah*

14. *Hay box*

a. *What are all the items cooked in hay box ?*

b. *Give the palatability of food cooked in hay box*

S.No.	Items	Tenderness			Doneness			Colour			Taste			Flavour		
		G	F	P	G	F	P	G	F	P	G	F	P	G	F	P

c. *List the reasons for adoption of hay box ?*

d. *List the advantages of using the hay box ?*

Saves time
Conserves fuel
Reduces labour
Need not strain water
Retains flavour of food
Saves money
Prevents charring and burning of food
Helps to keep foods warm
Prevents nutrients loss
Avoid reheating

e. *Give reason for non-adoption of Haybox*

14.a. *Give the reason for adoption of biogas ?*

b. *List the benefits acquired by using biogas plants ?*

c. *Give the problems encountered while using biogas plant ?*

d. *Give the reason for non-adoption of biogas ?*

15.a. *What are all the items stored in mud storage devices ?*

b. *Mention the advantages of using mud storage device ?*

c. *Evaluate the quality of items stored in the mud storage devices.*

S.No.	Items test	I			II			III			IV			V			VI			VII		
		G	F	P	G	F	P	G	F	P	G	F	P	G	F	P	G	F	P	G	F	P

d. *Give the reason for non-adoption of mud storage device at your home?*

16.a. *List the problems in the adoption of the technologies ?*

b. *What is the improvement in the standard of living of the homemakers due to the adoption of household technologies ?*

c. *Mention the benefits acquired due to the adoption of the household technologies at your home ?*

APPENDIX II

LESSON PLAN

S.No.	Course content	Methods	Aids used
1.	**Water**		
	Safe Handling of drinking water *Need for water purification techniques* *Low cost treatment of drinking water* *- Charcoal water filter* *- Chlorination pot for well* *- Water filter* *- Defluoridation of drinking water* *- Chlorine tablets and ampoulses for disinfection of potable water* *- Boiling method* *Need for water conservation* *Water conservation techniques* *Rain water harvesting method and need*	*Lectures, exhibitions, demonstration, face to face contact, filmshow, discussion and meeting*	*Poster and chart display*
2.	**Health and hygiene**		
	Importance and need for environmental sanitation and cleanliness *Importance of waste water utilization* *Method of disposal of household sullage* *Kitchen gardening,* *Soak-pit* *Need for sanitary latrine in the households* *Concept and inculcating the sanitation habits* *Social forestry*	*Lecture, exhibitions, Demonstration, group discussion individual contact*	*Chart distribution of seeds and samples, pamphlet, poster and chart display*

3.	*Labour saving devices*		
	Creating awareness regarding low cost labour saving devices *Importance of low cost labour saving devices* *Methods of using low cost labour saving devices* *Types of low cost labour saving devices* *Comparison of traditional and smokeless chulah* *Advantages of using smokeless chulah* *Advantages of using pressure cooker and kerosene stove, gas and biogas* *Demonstration on making hay box* *Advantages of using mud storage device* *Fuel conservation techniques for household* *Work simplication methods* *Time management* *Money management* *Drudgery reducing methods* *Benefits and knowledge regarding household technologies*	*Lecture, talk demonstration exhibitions, individual contact meeting, group discussion, Tam-Tam*	*Poster, chart display, demonstration and pamphlet*

APPENDIX IIIa

SOAK PIT

Stagnation of sullage (It is the waste water which does not contain human excreta, example waste water from kitchens and bathrooms) is a great health hazard If the available land permits growing of plants and trees, sullage can be used to irrigate them Otherwise sullage disposal can be successfully made using a soak pit

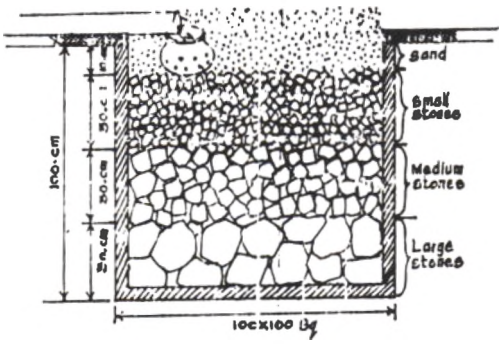
A soak pit is a simple device for absorbing and transferring sullage to the sub-soil.

Advantages :

1. Prevents stagnation of water
2. Arrests breeding of mosquitoes and flies.
3. Helps to maintain sanitation.
4. Enhances aesthetic surrounding
5. Requires simple skill and technology
6. Low cost
7. Easy to maintain
8. Minimizes health hazards.

Construction of a soak pit

1. Select 1 Sq, metre area near the drain outlet about 30 cms. away from the wall so that moisture from the pit does not seep into the foundation of the house.
2. Mark the boundary in the selected area and dig a one metre deep pit.
3. Select three grades of stones of different sizes and shapes, 10-15 brick pieces and gunny bags.
4. Keep ready a cart load of river sand.
5. Fix a perforated metallic trap at the drain exit of the house for retaining solid waste if any.
6. Fill the pit in three layers of 30 cm. each with large stones (to facilitate easy percolation) medium size stones and small stones (to create an even layer) respectively and leave a 10 cm. gap above these layers.
7. Fix a drain pipe to direct the sullage into the soak pit whose exit end will be concealed in the ground.
8. Raise 15 cms. high wall around the trap with brick and lime mortar, to prevent rain water flowing into the trap
9. Cover the pit with the gunny bags, level up the surface to the surrounding area in such a way that, when completed the drain trap alone will be visible.
10. Start using the soak pit after a day. Green vegetation can be raised around the pit.



Sectional View of Soak Pit

APPENDIX III 6

SMOKELESS CHULAH

In India, it is said that 90 per cent of households in rural areas, and 25 per cent in the urban areas use firewood stoves. More than half the world's kitchens use simple wood burning stoves for cooking. The traditional methods of cooking which have been used for centuries, with little modifications, involve burning wood in an open fire, sometimes enclosed by a house-shoe shaped alcove made of clay or bricks to act as windshield In some cases, three stones are placed around the fire to act as supports for the cooking vessel. The method is very inefficient as only 5 to 10 per cent of the potential energy in the wood fuel is utilised in the cooking process. This is unhealthy too, for persons in the house especially the women who handle the cooking, are exposed to the constant emission of smoke and soot.

It is hazardous Burns and scales can result from sparks from burning logs or from unstable pots. Also, the compustible structures are exposed to fire damage. The soot may come in contact with the cooked food and thus make the preparation unsantitary Generally, only one food item can be prepared at a time

We use a variety of fuels for cooking such as wood, coal, kerosene, gas, electricity etc. Moreover the availability of these fuels is decreasing day by day as their reserves are limited, forcing us to consider alternative sources of energy and ensure a more efficient use of fuels.

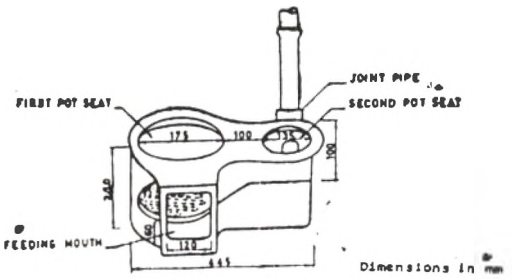
Smokeless chulah is a simple device that needs to be designed with perfect technical skill. Improved, well designed, fuel efficient low cost and appropriate smokeless chulah, are the answer to the many problems associated with firewood shortage, smokeless chulah ensures a clean and safe, cooking process. Due to elimination of smoke and soot, the kitchen will be a clean and cheerful place for the family gathering.

Special features of the chulah

- Size of the pot seats facilitate the use of utensils of different sizes for two varied functions.
- Size of the feeding mouth is smaller in order to minimize feeding with only the required amount of firewood.
- The thermal efficiency of the chulah is 25 per cent.

Guidelines for Using Smokeless Chulah

1. The feeding mouth should not be over crowded with fuelwood
2. Only 2-3 logs of fuelwood need to be used
3. Ash should be periodically revioued
4. Dampers should always be used
5. Both the pot seats should be used simultaneously
6. Flat bottemed utensils should be used



view of Smokeless Chulah

APPENDIX III.

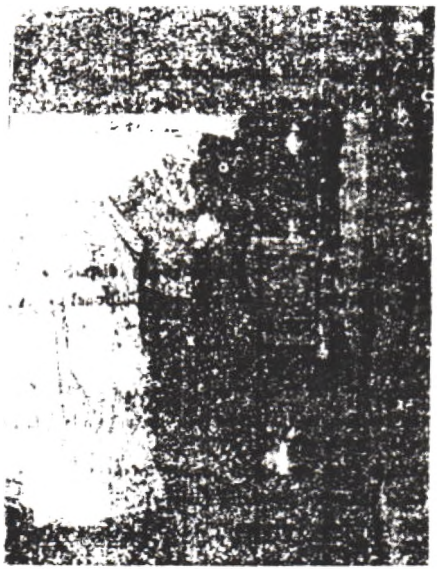
The ever increasing energy crisis has made us to adopt many measures to conserve fuel. Hay box is a low cost labour saving device which helps to save part of the fuel required for cooking. Therefore, this is also called as "fire-less cooker"

Advantages :-

1. It is cheap
2. Saves time and energy
   Reduces labour
3. Conserves fuel
   Prevents loss of nutrients
4. Retains flavour of food
5. Prevents charring or burning of food
6. Helps to keep food warm
   (use as a hot case)

Construction of a Hay Box :

1. Select a wooden box with a removable lid of size 75cm × 50cm × 37.5cm (length × breadth × height).
2. A gunny bag pillow filled with hay should be made which tightly fits the size of the box.
3. Fill one - third of the box with hay.
4. A vessel which could cook the required quantity of food should be placed tightly in the centre of the box, such that the edge of the vessel coincides with the surface of the box.
5. The intervening space between the vessel and the box should be packed close with hay.
   Remove the vessel, such that it leaves an impression in the middle
7. The vessel should be closed with a tight fitting lid
8. The pillow should be well fitted to the box.
9. Cover the box with a lid



Homemaker Using the Hay Box

Materials required :

1. Wooden or Cardboard box
2. Hay - sufficient in quantity to fill the sides of the box and to be used as a cushion on top
   Gunny bag - to make a pillow to cover the surface

APPENDIX IV

SCHEDULE TO ASSESS THE KNOWLEDGE LEVEL OF THE TECHNOLOGIES OF THE HOMEMAKERS

S.No.	Items	Aware	Not aware	Partially aware
		High	Low	Average
1.	Materials required			
2.	Types			
3.	Place required			
4.	Construction cost			
5.	Procedure for handling			
6.	Benefits			
	Conserves time			
	Conserves money			
	Conserves energy			
	Low cost			
	Reduces drudgery			
	Prevents nutrient loss			
	Occupies less place			
	Utilizing resource by following proper method			
	Creates healthy environment			

APPENDIX V

SCHEDULE TO ELICIT THE OPINION OF THE HOUSEHOLD TECHNOLOGIES INTRODUCED TO THE HOMEMAKERS

S.No.	Items	Good	Fair	Poor
1.	Easy to handle			
2.	Easy to clean			
3.	Suitable for daily cooking			
4.	Removes the drudgery			
5.	Simple technology			
6.	Faster better family relationship			
7.	Health problem reduced			
8.	Improves the efficiency of doing work			
9.	Saves time			
10.	Extra leisure time			
11.	Utilizing resources by following proper method			

APPENDIX VI

CHECK LIST TO STUDY THE EFFECTIVENESS OF TECHNOLOGIES IMPARTED TO THE HOMEMAKERS

S.No.	Criteria	Good	Fair	Poor
1.	Easy to store			
2.	Easy to handle			
3.	Easy to clean			
4.	Easy to maintain			
5.	Convenient shape			
6.	Adequate size			
7.	Comfortable height			
8.	Easy to fabricate at household level			
9.	Easy mobility			
10.	Low cost			
11.	Durability of material used for construction			