CHAPTER 0

INTRODUCTION

0.1 The Indian Energy Scene

The universe is believed to have come in existence with great explosion releasing an enormous amount of energy. This energy is distributed in the entire universe having life on it. However, with the technological development, the desire resulting into need, for materially well being of man, has increased. Man, at first, largely depended upon the forests, for his energy requirements and used sun too, to some extent. He then discovered buried treasures of earth - so called fossil - fuel (coal). Later with better understanding of nature's laws, an era of experimentation and exploration began. Man became the master of his environment harnessing natural energy to lighten his workload and ease the burden of day to day living. He disturbed the balance of the nature by destroying the forest, polluting the environment resulting into the loss of energy wealth, which the nature had taken millions of years to create. Now the man is beginning to understand the dangers of such exploitation. A new era of energy conservation and regeneration has begun. Researches are done for safer, cleaner and self generating forms of energy.

Energy is the capacity for doing work. It makes the things go and grow. Energy surrounds us. It is in the air, in the water,

in the sunlight and in the crops we grow. Energy is required for transportation, agriculture, manufacturing, clean air, water, cooking and entertainment. There are two types of energy sources namely commercial and non-commercial sources of energy. In the developing countries the energy consumption particularly commercial is being consumed in the urban areas for industrial, commercial and even domestic uses. The non-commercial energy is typically consumed in rural areas with the use of firewood, agricultural residues, animal manure, human and animal power.

Energy is a vital requirement for economic development and for domestic use. Increasing amounts of energy are needed to improve agricultural production, turn the wheels of industries and keep them moving, as well as provide goods and services throughout the nation to improve the quality of life of our people. The growth of commercial energy in India is much faster and the non-commercial sources are vanishing fast. The energy scenario in India is becoming more complex. The important traditional sources of commercial energy are coal, oil, hydro and nuclear power. The non-commercial sources of energy are firewood, agricultural wastes, animal dung, animal and human power. As per Henderson (1975), the component of non-commercial energy in India was 48 per cent. Due to rapid development of industrialisation the energy was needed for building the infrastructure which resulted in faster growth of commercial energy.

The Advisory Board of Energy (ABE,1985) has prepared an energy scenario on some basic assumptions regarding minimum level of energy consumption in the domestic sector. The number of households in rural sector are 100.9 mllions while those in urban sector are 32.1 million. The energy consumption for the domestic sector as per ABE is 680 Kilo calories per person per day. Of these, 620 Kilo calories are consumed for cooking and 30 Kilo calories each, are used for space heating and lighting. The fuel consumption for lighting and cooking in rural and urban (ABE,1985) sector shows that in rural areas 84 per cent lighting is done through the use of Kerosene, while 94.5 per cent of cooking is done in rural area through non-commercial fuel. In urban sector 53 per cent of lighting is from electricity and 45.2 per cent is from kerosene. Whereas 58 per cent of cooking is done through non-commercial energy sources in urban areas, however 26.5 per cent of it is through kerosene which is a commercial source of energy.

0.2 Energy System in India

In order to overcome energy crisis the energy planners and scientists all over the world have started thinking in terms of decentralising energy systems. In India since last 10 to 15 years efforts are being made to conserve energy, educate the community on depleting energy sources and utilize the alternate forms of energy.

Recognising the importance of energy for the overall economic development of various forms of energy, new Ministry of Energy was created in October 1974 in India. This ministry has been given the responsibility for framing general policy in the field of energy. India has taken a lead by setting up a Commission for Additional Sources of Energy (CASE) on 12th March,1981 and the Department of Non-Conventional Energy Sources on 6th September,1982 under the Ministry of Energy, which have different functions in planned energy system in India. The State of Gujarat in India took the initiative in establishing Gujarat Development Agency (GEDA) in June 1979 with headquarters in Baroda. Similar State level nodal agencies along the lines of GEDA have been established throughout the country to co-ordinate the promotion of renewable sources of energy.

0.2.1 FUNCTIONS OF COMMISSION FOR ADDITIONAL SOURCES OF ENERGY (CASE)

This Commission is responsible for

a. Formulating policies and programmes for development of new and renewable sources of energy.

b. Co-ordinating and intensifying research and development of activities in new and renewable sources of energy.

c. Ensuring implementation of government policies in regard to all matters concerning new and renewable sources of energy and preparing budget of the Commission.

0.2.2 FUNCTIONS OF DEPARTMENT OF NON-CONVENTIONAL ENERGY SOURCES (DNES)

The DNES carries out the functions like

a. Implementing the policies made by Commission of Additional Sources of Energy (CASE).

b. Making plans, initiating, financally supporting and monitoring researches.

c. Planning programmes for developing different devices and disseminating information regarding them through programmes like seminars, workshops, demonstrations, training programme for all new and renewable sources of energy such as solar, thermal systems, solar photovoltics, Biogas, Improved cookstoves and solar cooker.

0.2.3 FUNCTIONS OF GUJARAT ENERGY DEVELOPMENT AGENCY (GEDA)

The State Energy Development Agencies are delegated with different functions and priorities according to available sources of energy in the State and scope for utilization of alternate sources of energy. The functions of GEDA include -

a. Sponsoring, co-ordinating and promoting research programmes on projects for development of phototypes, pilot plans and investigations in the area of new and renewable sources of energy.

b. Providing technical, financial and/or other assistance for the formulation of programmes, designs and projects meant

for extension of renewable energy development programmes in the State.

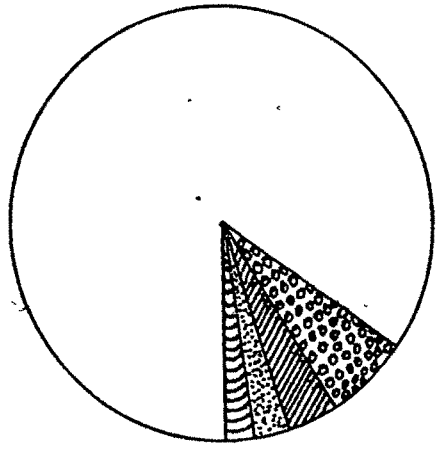
c. Identifying and formulating proposals for setting up demonstration projects of energy plantations within the State.

d. Undertaking on its own or in collaboration with other agencies, programmes of research and development, appli--cation and extension as related to various new and renewable energy sources.

e. Formulating and implementing a broad based programme for conservation of energy at all stages, including extra--ction, conversion, distribution and consumption in all the sectors of the economy.

f. Studying the environmental effects of all energy related processes.

0.3 Energy Consumption in Gujarat



Domestic	86 %
Agriculture	8 %
Transport	3 %
Lighting	1.5 %
Rural Industries	1.5 %
Total.....	100 %

In the total pattern of energy consumption in Gujarat, cooking forms the largest category. Energy in rural areas is primarily needed for basic functions such as cooking and other domestic uses. In rural Gujarat, of the domestic energy consumed 76 to 84 per cent is derived from wood and twigs and energy from dung cakes accounts for 3 to 4 per cent. Therefore, it is necessary to pay attention to eergy consumption patterns in Gujarat from cooking point of view.

0.4 Scarcity of Non-Commercial Sources of Energy

Only few fuels are used for cooking in Gujarat. Of these firewood, agricultural waste, cow dung, Kerosene and charcoal are the most important fuels used in the rural areas.

The problems of FIRE WOOD is very well known to scientists and technologists. India's current firewood consumption is estimated at 133 million tonnes. Most of it is being used in cooking. To cook 1 kilogram of food 1.2 kilogram of fuel wood is required. This indicates that we need to produce more wood than food if it is to be cooked before it is consumed. Now it is no longer justified to use large amount of wood for cooking purposes. Deforestation has resulted in the present fuelwood deficit of 84 million tonnes which is estimated to increase to 125 million tonnes by the turn of the century. The new policy of Government of India is based on reforestation and in this respect cutting of the trees is prevented and fuelwood saving devices are produced.

The story of energy crisis not only in India but in several other developing countries is the same. It has been estimated that nearly 130 crores people in rural areas of third world do not have enough firewood to cook their food. The number is expected to increase in coming years. It is also estimated that half of the families of the world use firewood for cooking. Perhaps 30 per cent of urban households and 90 per cent of rural households in developing countries use fuelwood for cooking. (Hughart, 1979).

Agricultural waste is available in large quantities for use by rural poor as it is available free or at nominal cost but it has low caloric value, so using it for cooking purpose is not much efficient and effective. Moreover, now a days the rural poors also do not get this agircultural waste free of cost or at low cost. Hence, one finds that it is used less by them. Burning cowdung is not very efficient and effective way of utilizing scarce fuels, as these cakes too have low caloric value. Kerosene is used by a large number of people in addition to other fuels. However, Kerosene is scarce. Moreover in last few years price of Kerosene has increased considerably and availability has become poorer.

In Gujarat char coal is not much common as other fuels for cooking, but if it is used it has higher calorific value than that of wood or cow dung cakes. The disadvantage of this fuel, however, is the considerable cost that is involved in its production.

In urban areas the use of gas and electricity as sources of energy for cooking are more common. Both these fuels have disadvantages too. Availability of gas for domestic use is scarce. It is not readily available and is also very expensive. The price for electricity is increasing rapidly. Moreover, frequent power cut disturbs the process of cooking with electricity as source of energy.

0.5 Wastage of Produced Energy

Looking to the history of domestic utilization of fire, one can say that it probably began around four to five million years ago. Cooking became more common in the middle or the early part of the ancient times. The first fuel used was bone. Most methods of cooking like rod and stick roasting, baking, boiling water in bamboo, seem to have developed at very early stage.

Many variations in the use of fuels and the methods of cooking were incorporated in the subsequent designs of cook stoves, but these did not make any significant contribution to energy consumption through the growth of civilization. The only popular method which was seen and is still practiced by many of the rural people is open fire cooking or three stone cooking, a pit in the ground or U shaped hole in block. The traditional appliance used for cooking is chulha (cook stove) which burns

firewood, agrcultural waste or cow dung in an extremely inefficient manner. It doesd not utilize all the energy that is produced by burning the fuel.The efficiency of the traditional mud cook stoves ranges from 2 to 15 per cent which means only 2 to 15 per cent of energy produced by the fuel used, is utilized in the traditional mud cook stoves. It emits smoke because of low efficiency which is dangerous to health and environment. It requires more fuel which results in loss of another valuable resource namely time spent in collection/procuring fuel. So one needs to improve the traditional cook stove to save tonnes of wood as well as lot of time and human energy spent to acquire it.

0.6 New and Renewable Sources of Energy Used for Cooking

A number of activities have been undertaken in the field of development and dissemination of new and renewable energy sources. The devices for cooking purposes are produced through continuous Research and Development (R&D) work. The most obvious results of R & D work undertaken in India through various academic bodies and voluntary agencies are :

0.6.1 INTRODUCTION OF IMPROVED COOKSTOVES

The Department of Science and Technology launched the National Project on Demonstration of Improved Cookstoves in December 1983. Under this they had multi-model and multi-agency approaches; several models of improved cookstoves both fixed and

portable having an efficiency of 10 to 25 per cent were demons--trated all over the country. The design of Improved Cookstoves incorporated an optimum size of combustion chambers, air inlet, grate, baffles, dampers and some designs having chimney. Apart from fuel wood most of these models of Improved Cookstoves can use cowdung cakes or pallets, coal, rice husk, saw dust and brick husk. These cookstoves give a clear flame and do not emit smoke, so do not pose any damage to health. These improved cookstoves are given to users at subsidised rates.

0.6.2 INTRODUCTION OF ALTERNATE SOURCES OF ENERGY NAMELY BIOGAS AND SOLAR ENERGY

0.6.2.1 Biogas. The National Project on Biogas Development Programme was launched in 1982 by the Department of Science and Technology. In India biogas is mainly produced from cowdung and sewage. Extensive Research and Development is being done for evolving suitable technology for production of biogas from crop residues/water hyacinth and vegetable waste. Biogas Technology has helped in the fuel value of organic waste material without destroying their fertilizer value. Biogas is cheap and efficient fuel. Two types of biogas plants are promoted under this scheme namely the family biogas plant and community biogas plant.

The use of biogas plants has social, physiological and psychological benefits. Its use, eliminates the drudgery of rural women. Design of biogas incorporates inlet, big pit with dome, outlet and the pipeline to supply the produced gas. The

Department of Non-Conventional Energy Sources, under National Development Project on Biogas Development, of the Government of India, provides for central subsidy to the beneficiaries, organisational support to State Government for setting up of regional biogas centres and gives incentives to village function--aries. Every family installing a biogas plant is eligible to receive Government subsidy. The quantum of subsidy varies according to size of the plant and the category of benefciaries.

0.6.2.2 Solar Cooker. The Commission for Additional Sources of Energy (CASE) and the Department of Non-Conventional Energy Sources (DNES) approved the scheme for the manufacturing and distribution of solar cookers throughout the country during the financial year 1981-82 at subsidised cost. Design of solar cooker incorporates the outer box, the inner box, thermal insulation, the double glass cover, mirror and cookiing containers. The energy used in solar cooker is only solar energy. Solar cooker offers number of advantages. It saves fuel. It also saves human being from time consuming actvities such as fuel gathering and feeding of fire in the cookstoves. The natural environment is not affected by pollution or bad smell produced by use of fuel. No accidents can take place and finally no health hazard can be caused to women who cook in kitchen.

These solar cookers are being distributed at national level and State level through the approved organisations/ agencies.

In Gujarat, solar cookers are distributed through Gujarat Energy Development Agency (GEDA), Baroda, at subsidised cost. Along with the subsidy provided over the selected models of solar cooker, the cost comes to Rs.625/- approximately.

0.7 Potential for Use of Solar Energy in Gujarat

India is lying between the latitudes of 7°N and 37°N. Approximate quantity of solar energy falling on India is 3000 million kWH per year. Which is 3000 times of energy required in 2000 A.D. There are between 250-300 days of useful sunshine per year in most part of our country. Over 3000 hours of bright sunshine are received everyday over Rajasthan, Gujarat, West Madhya Pradesh and North Maharashtra. Gujarat is located within the latitude of 20°N to 25°N which makes it one of the parts of India with abundunt source of solar energy. This abundance of solar energy is condusive to the exploitation of solar energy through solar cooker for cooking. New researches and developments in the area of harnessing solar energy in Gujarat provide lot of scope for using it for domestic purpose in Gujarat State.

0.8 Distribution of Solar Cookers in Schools of Gujarat by GEDA

In Gujarat solar cookers are distributed at subsidised cost through Gujarat Energy Development Agency to the schools. Children are the future users of solar cooker. In future

probably they will have to face much greater crisis for energy. Hence, it is vital that they are educated now and prepared for future which will enable them to lead a better quality of life and face the changed pattern of scenario then. Keeping this in view it was decided to collect the statistics of distribution of solar cookers by GEDA.

Table 1. Distribution of Solar Cookers in Schools

Year	No.of Solar Cookers Distributed	General Sales	GEDA Subsidy	DNES Subsidy
1986-87	165	375	225	150
1987-88	348	375	225	150
1988-89	1008	435	285	150
1989-90	291	500	358	150
1990-91	151	500	358	150
1991-92	23	500	358	150

(GEDA Profile)

Findings from the above table reveals that in 1986-87 GEDA started distributing solar cookers in the schools. It was in the year 1988-89, more than 1000 solar cookers were distributed with the general price of Rs.435/-, GEDA subsidy of Rs.285/- and DNES subsidy of Rs.150/-. Table further reveals that 1988-89 was the year when maximum number of solar cookers were distributed at a relatively lower price.

When the reason for such high distribution of solar cooker to schools were studied and probed into, it was learnt that the

distributors of solar cookers were directed by GEDA to develop personal contacts with schools in their area and distribute the solar cooker through them.

Second reason was that in 1988-89 more funds were allocated for popularising and distributing solar cookers to people in rural areas particularly through the institutions and organizations which had access to greater number of people. Schools were identified as such institutions. Thus a large number of 1000 solar cookers were distributed to the schools.

Recognition of schools as means to popularise solar cookers by GEDA - the nodal agency in Gujarat provided enough justification for present study to be conducted on the sample of adolescent boys and girls from urban and rural schools in Baroda district.

0.9 Concern of Home Science

India is a fast developing country with its prime objective of improving the quality of life. Therefore, its main concern is to bring about desirable social change in the family. Indian homes and the task of home making has undergone a tremendous change during past years. The modern homes are the result of various social economical as well as technological and scientific advancements. The kitchen is the main pillar of a household sector on which the rest of the sectors are resting.

The content of Home Science is family centred and aims at developing basic life skills for better living, enabling home makers and family members to solve day to day problems. One such major problem is that of managing of fuel for cooking. The fuel in the rural houses is collected by men and women. Due to the scarcity of fuel the urban and rural population is facing the problem of fuel. In order to overcome such problem Home Scientists can play a major role in giving the energy education to people by means of formal and non-formal programmes through schools, colleges, Mahila Mandals and voluntary organisations as well as through Extension Education Departments of the Traditional and Agricultural Universities.

Energy systems in India at central and State levels are working for exploring new and renewable energy sources. They develop devices which save energy. Many different programmes for dissemination and acceptance of new and renewable energy sources, devices using them as well as fuel saving devices are beng conducted by the Department of Energy of Central as well as State level in India. The different ways used for dissemi--nation of such information are Demonstration and use of Audio Visual shows. Training programmes are also planned to promote improved cookstoves, biogas plants and solar cookers. It has been observed from the promotional work done by Parlikar and others (1987-88) that showing the films only, demonstration on anytraining programme alone, will not make the programme

acceptable. Therefore, it was felt by the investigator that the dissemination of energy information through Home Science in formal and non-formal situation assumes vital significance. Therefore, on the assumption that energy education through communication strategies is important and integral part of home and home science education, it was strongly felt by the investigator that it is necessary to undertake research at formal or non-formal situation for promotion of energy saving devices like improved cook stoves, biogas plants, solar cooker. Thus, the present investigation was undertaken.

0.10 Statement of Problem

A study of Relative Effectiveness of two selected strategies namely live programme vs. Videoed programme of Bhavai and Exhibition cum Demonstration for Promotion of Solar Cooker.

0.11 Justification for the Study

The first and the most important aspect that arouses the interest in the area of Energy Education through communication strategies is due to the Energy crisis faced by the household sectors in urban and rural areas. Development of devices using new and renewable energy sources, distribution of these devices at subsidised cost to the society and promotion of the devices by the State level agencies are other important aspects which create interest in the mind of a researcher. Solar cookers are distributed at 90 per cent subsidy. On one hand thorough

attempts to find new and renewable energy sources as well as development of new devices using these resources have been made on the other hand no co-ordination between investigators, experts in energy, and the planners, executors and evaluators of energy promotion programmes is seen. Every one seems to be doing his/her job without considering its implications on the overall energy education.

Home Science Education and Extension as a field of study is very popular for its urban and rural extension work since years. The Department of Home Science Education and Extension at Faculty of Home Science has carried out many research projects such as fuel management practices of home makers and its effects on their health in urban and rural areas as well as promotion of devices using conventional and non-conventional fuel. Along with this the department has also produced graphic aids, slides and video films for promotion of devices using new and renewable sources of energy for the school going children and women in which the investigator has played major role as research associates. It has been observed from the promotional work and previous researches conducted in 1986 and 1988 by Parlikar and others that there is lack of awareness resulting into lack of motivation and proper education for acceptance and adoption of new devices using new and renewable energy sources for cooking. The target through different programmes are achieved by the different organizations, institutions and

agencies withn a given period of time. This did not necessarily mean that these non-conventional sources and its devices were accepted and adopted by them in their daily life.

Most of the communication strategies by the nodal agencies are produced and used for consumer group in informal situation. No special attempt is known to have been made for imparting formal instruction in energy education, classroom instructions for use of devices utilising non-conventional energy sources as well as for promoting improved cook stoves using conventional source of energy till the time this study was undertaken. So, the investigator was interested in taking the present study.

Therefore, it was felt that the investigator should work out different communication strategies for popularising non-conventional fuel like solar energy for cooking through solar cooker and study their relative effectiveness for both formal as well as non-formal groups. It was, therefore, felt necessary by the investigator to undertake the present study for formal group of secondary and higher secondary classes of selected urban and rural schools initially. The present study was undertaken with following objectives.

0.12 Objectives of the Study

General Objectives

1. To develop Bhavai as motivational programme and Exhibition cum Demonstration as educational programme for promotion of solar cooker among students from urban and rural schools.

2. To produce a videotape of Bhavai as motivational programme and Exhibition cum Demonstration as educational programme for promotion of Solar Cooker among students from urban and rural schools.

3. To study the relative effectiveness between the two selected strategies namely live and videoed Bhavai as motivational programme and Exhibition cum Demonstration as educational programme for promotion of Solar Cooker in relation to the selected variables.

4. To study the effectiveness of live and videoed Bhavai as motivational programme and Exhibition cum Demonstration as educational programme independently for promotion of Solar Cooker in relation to the selected variables.

5. To study the relative effectiveness within the selected strategies namely live/videoed Bhavai as motivational programme and Exhibition cum Demonstration as educational programme for promotion of Solar Cooker in relation to the selected variables.

Specific Objectives

Section-I. Bhavai as Motivational Programme

1. To develop live and videoed Bhavai as motivational programme for promotion of Solar Cooker among students from urban and rural schools.

2. To study the overall relative effectiveness between the two selected strategies namely live and videoed Bhavai as motivational programme for promotion of Solar Cooker among the students from urban and rural schools.

3. To study the relative effectiveness between the two selected strategies namely live and videoed Bhavai as motivational programme in relation to selected variables namely place of habitation, class of study, sex and level of intelligence of the selected students from urban and rural schools for promotion of Solar Cooker.

4. To study the overall effectiveness of live and videoed Bhavai independently as motivational programme for promotion of Solar Cooker among the students from urban and rural schools.

5. To study the effectiveness of live and videoed Bhavai independently as motivational programme in relation to selected variables namely, place of habitation, class of study, sex and level of intelligence of the selected students from urban and rural schools for promotion of Solar Cooker.

6. To study the relative effectiveness within the selected strategies namely live / videoed Bhavai as motivational programme in relation to selected variables namely place of habitation, class of study, sex and level of

intelligence of the selected students from urban and rural schools for promotion of Solar Cooker.

Section-II. Exhibition cum Demonstration as Educational Programme

1. To develop live and videoed Exhibition cum Demonstration as educational programme for promotion of Solar Cooker among students from urban and rural schools.

2. To study the overall relative effectiveness between the two selected strategies namely live and videoed Exhibition cum Demonstration as educational programme for promotion of Solar Cooker among the students from urban and rural schools.

3. To study the relative effectiveness between two selected strategies namely, live and videoed Exhibition cum Demonstration as educational programme in relation to selected variables namely, place of habitation, class of study, sex and level of intelligence of the selected students from urban and rural schools for promotion of Solar Cooker.

4. To study the overall effectiveness of live and videoed Exhibition cum Demonstration independently as educational programme for promotion of Solar Cooker among the students from urban and rural schools.

5. To study the effectiveness of live and videoed Exhibition cum Demonstration independently as educational programme in relation to selected variables namely place of habitation, class of study, sex and level of intelligence of the selected students from urban and rural schools for promotion of Solar Cooker.

6. To study the relative effectiveness within the selected strategies namely live / videoed Exhibition cum Demonstration as educational programme in relation to selected variables namely place of habitation, class of study, sex and level of intelligence of the selected students from urban and rural schools for promotion of Solar Cooker.

0.13 Assumptions of the Study

1. The selected concepts and generalizations related to Solar Cooker are available in literature like books, journals, periodicals and thesis. They can be identified organised and presented through different communication strategies for promotion of Solar Cooker.

2. The students of secondary and higher secondary classes of urban and rural areas can be motivated through live and videoed Bhavai and effect of motivation can be measured in terms of motives through motivational scale after the experimental condition.

3. The students of secondary and higher secondary classes of urban and rural areas will be able to learn through live and videoed Exhibition cum Demonstration and their effect can be measured in terms of knowledge gained through knowledge test after the experimental condition.

4. The selected students of secondary and higher secondary classes of urban and rural areas will participate in the experiment, planned and will be able to respond to the developed evaluative measures, namely, motivational scale and knowledge test before and after the experiment for promotion of Solar Cooker.

5. There is a group intelligence test available to measure level of intelligence of urban and rural adolescence to which the students will respond.

0.14 Null Hypotheses of the Study

Section-I. Bhavai as Motivational Programme

1. There will be no significant difference in the adjusted posttest mean scores achieved on motivational scale by selected students due to their exposure to live and videoed Bhavai as motivational programme for promotion of Solar Cooker.

2. There will be no significant difference in the adjusted posttest mean scores achieved on motivational scale by

selected students due to their exposure to live and videoed Bhavai as motivational programme in relation to selected variables namely place of habitation,class of study, sex and level of intelligence for promotion of Solar Cooker.

3. There will be no significant difference in the mean scores of pretest and posttest achieved on motivational scale by selected students under two experimental conditions, namely, live and videoed Bhavai independently as motivational programme for promotion of Solar Cooker.

4. There will be no significant difference in the mean scores of pretest and posttest achieved on motivational scale by selected students under two experimental conditions, namely, live and videoed Bhavai independently as motivational programme in relation to selected variables, namely, place of habitation,class of study,sex and level of intelligence for promotion of solar cooker.

5. There will be no significant difference in the mean scores of pretest and posttest achieved on motivational scale by selected students within the experimental conditions namely live / videoed Bhavai as motivational programme in relation to selected variables namely place of habitation, class of study, sex and level of intelligence for promotion of Solar Cooker.

Section-II. Exhibition cum Demonstration as Educational Programme

1. There will be no significant difference in the adjusted posttest mean scores achieved on knowledge test by selected students due to their exposure to live and videoed Exhibition cum Demonstration as educational programme for promotion of Solar Cooker.

2. There will be no significant difference in the adjusted posttest mean scores achieved on knowledge test by selected students due to their exposure to live and videoed Exhibition cum Demonstration as educational programme in relation to selected variables, namely, place of habitation, class of study, sex and level of intelligence for promotion of Solar Cooker.

3. There will be no significant difference in the mean scores of pretest and posttest achieved on knowledge test by selected students under two experimental conditions namely, live and videoed Exhibition cum Demonstration independently as educational programme for promotion of Solar Cooker.

4. There will be no significant difference in the mean scores of pretest and posttest achieved on knowledge test by selected students under live and videoed Exhibition cum Demonstration independently as educational programme in

relation to selected variables namely place of habitation, class of study, sex and level intelligence.

5. There will be no signficant difference in the mean scores of pretest and posttest achieved on knowledge test by selected students within the experimental condtions namely live / videoed Exhibition cum Demonstration as educational programme in relation to selected variables namely place of habitation, class of study, sex and level of intelligence for promotion of Solar Cooker.

0.15 Limitations of the Study

1. The study is limited to the boys and girls of 9th and 11th standard of selected urban and rural schools in the year 1990-91 of Baroda Taluka.

2. The experiment is limited to motivate the students through Bhavai and teaching selected concepts and generalizations on solar cooker through Exhibition cum Demonstration.

3. The study is limited to use selected strategies namely live programme and videoed programme shown only once to the selected students.

0.16 Scope of the Study

1. The present study will provide a systematically selected concepts and generalizations on solar cooker for 9th and

11th standard students of Baroda Taluka.

2. The study will also experimentally test the relative as well as independent effectiveness of the two selected communication strategies namely live and videoed Bhavai as motivational programme and Exhibition cum Demonstration as educational programme for promotion of Solar Cooker.