ASSESSING ENVIRONMENTAL SANITATION OF RURAL HOUSEHOLDS IN ASSAM.

By

HIMADRI SAIKIA

A THESIS SUBMITTED TO THE AVINASHILINGAM INSTITUTE FOR HOME SCIENCE AND HIGHER EDUCATION FOR WOMEN - DEEMED UNIVERSITY, COIMBATORE - 641 043

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE IN FAMILY RESOURCE MANAGEMENT

APRIL - 1998

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(Certified as bonafide research work)

Signature of the
Head of the
Department

Signature of the
Guide

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A Kindness done in the hour of need may look small
but outweigheth the whole world

- THIRUVALLUVAR

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Introduction

I INTRODUCTION

"Acquire a knowledge of hygiene and sanitation,
You will have wonderful health and vitality,
Peace, Prosperity and Longevity".

- Swami Sivananda

Health is a vital part of the great experience of living and is a common theme in all the cultures. It is the life long dynamic fusion of interesting physical, emotional, social, intellectual and spiritual strength. Good health is of immense importance for personal happiness, family progress and for the prosperity of nation.

Kaur and Sharma (1987) and Ghosh (1995) state that health is a state of vibrant equilibrium or adjustment between man and his environment. Carter and Wilson (1992) opine that health is a powerful status that result from an interaction between hereditary potential, environmental influences and life style selections. Good health depends on practicing good personal hygiene, developing good eating habits, exercising properly and getting rest and sleep. Indeed, one can not deny that positive health habits are conducive to good health.

According to Education Planning Commission (1990) health is a matter which affects not only each one of us as individuals but also the community in which we live. The health status of an individual, a community or a nation is determined by the interplay and integration of two ecological

universes - the internal environment of man himself and the external environment which surrounds him.

The concept of environment is complex and all-embracing. It is not only physical factors like air, water and soil that form our environment but also the social and economic conditions within which we live. It is the aggregate of all external conditions and influences affecting the life and development of an organism, human behaviour or society (Ghosh, 1995).

The state of environmental sanitation and personal hygiene are important factors in determining the health status of a community. Cleanliness, hygiene and health are interwoven and interdependent on each other to create a better environment. Park and Park (1995) define that hygiene is the science of health and embraces all factors which contribute to healthful living.

Environmental sanitation means the science of safeguarding health, providing healthful, protective, productive and beautiful surroundings to the people and enhancing their standard of living through the prevention of communicable diseases as the main objective (Carter and Wilson, 1992). The concept of sanitation was earlier limited only to the disposal of human excreta by cess pools, open ditches, pit latrine and bucket system. Today it connotes a

comprehensive concept which includes liquid and solid waste disposal, food hygiene, personal, domestic as well as environmental hygiene (Choudhury, 1996). For maintaining good sanitation, cleanliness and hygiene are important. Any crisis in the three factors - cleanliness, hygiene and health causes serious chaos and disturbance to the environment. Since a long time, environmental sanitation is rapidly deteriorating and causing several disasters to the biosphere. According to Anderson (1991) clean living is the first and most important step in the prevention of diseases. Each family must protect itself against diseases.

In India, 80 per cent of the population live in rural areas, and the prevailing sanitary conditions in the villages are very poor. The reasons for this condition are pollution from traditional methods of waste disposal, poor ventilation, overcrowded housing, unsafe drinking water from dugwells and local streams and lack of latrines (India, 1996). If proper attention is not paid to the disposal of these wastes, significant diseases can occur due to poor sanitation that could treaten the entire population (Insel and Roth, 1988).

India is still lagging far behind many countries in the field of environmental sanitation. Much of the ill-health in the country is due to defective environment. Bimla (1992) comments that next to poverty the feature of the

nation is its ability to ignore the surrounding filth. Diseases occur due to imbalances caused between man and his environment. The ultimate solution for many of the communicable diseases, which are prevalent in the country, depends on the improvement of environmental sanitation.

The major factors of environmental sanitation are considered as water supply, disposal of human wastes, refuse and the dead, housing and pollution (Ghosh, 1981). As WHO (1986) pointed out the control of all these factors in man's physical environment which exercise a deleterious effect on his physical development, health and survival will lead to better environmental sanitation.

Nothing is more dangerous to public health than intermittent water supply. An adequate supply of wholesome water is very important for any community (Educational Planning Group, 1990). Next, housing is part of the total environment of man and is greatly responsible for the health and also for occurance of disease among the dwellers. The house should be free from smoke, dust, odour, excessive noise, mosquitoes and flies (Rameshwaran, 1990). It is a well known fact that proper facilities for effective disposal of human excreta is a primary requisite for the development of the family and society on one hand and cities and nations on the other (Varshney, 1987 and Ali, 1993).

It has been estimated that 80 per cent of all sickness or diseases in the world is the result of impure water and carelessness with the disposal of human wastes. Every year 75 lakh man days are lost due to illness caused by water borne diseases and million children below 5 years die of dehydration (Prasath, 1991). Diseases like tuberculosis, rickets and other respiratory problems occur in those areas where there is poor ventilation and not enough ways to admit sunlight in to the houses. Poor sanitary condition leads to many other communicable diseases.

The ultimate solution for many of the communicable diseases which are prevalent in the country depends on the improvement of environmental sanitation, with greater focus on improving the staggering problems of rural sanitation. Patel (1995) remarks that improved sanitation is an essential component for achieving the country's commitment of attaining "Health for All" by the year 2000 A.D. The Government of India is taking immense effort to improve the sanitary conditions and thereby increasing the standard of living of the community (Srivastava and Srivastava, 1991). Sanitation planning in India is approximately 50 years old. Eventhough Government has taken up measures to improve the sanitary condition, the improvement is not worth mentioning (Srivastava, 1990 and Kurup, 1993).

Very little progress was observed even after implementing many programmes. The main reasons for this slow progress in the sanitation programmes were the lack of perceived need by the rural people, lack of motivation and poor perception of the importance of sanitation consequently leading to lack of co-operation in reaping the benefits of the Government programmes.

As a first step, the prevailing sanitary conditions should be studied before any action to be taken to improve it. Therefore, the investigator has taken up the study on "Assessing Environmental Sanitation of Rural Households in Assam" with the following objectives to:

1. understand the existing environmental sanitary conditions in selected areas.
2. find out the sanitary facilities available for selected households.
3. assess the awareness of selected families on the concepts of environmental sanitation.
4. analyse the impact of selected variables on the facilities available and responsibilities to protect the environment.

Review of Literature

II REVIEW OF LITERATURE

The literature pertaining to this study on "Assessing Environmental Sanitation of Rural Households in Assam" is dealt under the following headings:

A. Concept of Environmental Sanitation

B. Factors Affecting Environmental Sanitation

C. Health Hazards of Poor Sanitation

D. Measures to Improve Environmental Sanitation

A. Concept of Environmental Sanitation

Our environment is the asset of our generations to come. He who does violence to nature for transcient pleasure or profit is a batcher of the future for the people as a whole. Those who polluted nature including air, water and vegetation are truly the enemies of the nation. (Sing and Sing, 1988). Since everything in earth is related to everything else, keeping our environment clean and safe will keep us clean and healthy (Gupta et al., 1996).

Prasad (1993) opines that environment is a term which has many connotations. It is used in different sense in different disciplines, because environment has always been a vitual factor in the survival of life. Man's survival indeed depends upon his healthy association with the environment and the forces of nature. An ecological balance has to be maintained between man and nature (payne and Hahn, 1986)

Dayal (1987) and Mohan (1989) state that a deep relationship exists between the environment on earth and his life. Our environment is our surroundings. The environment may be defined as the outer physical and biological system in which man and other organisms live with many interacting components.

Agarwal (1989) and Goyal (1990) define sanitation as a programme of environmental health to provide a safe source and distribution of potable water and proper collection of waste water. The word sanitation denotes cleanliness required for healthy living.

Environmental sanitation refers to the means adopt to protect the health of the general public and not that of individuals. This is known as "public hygiene" or "public health". Public hygiene deals with the disposal of all kinds of refuse in towns and villages, the making and cleaning of roads, drain sewers, latrines, stables and cattle shed and the construction of houses. It also deals with the supply of water, prevention of the pollution of water and air, the notification of infectious diseases, the measures required to prevent their spreading and the registration of births and deaths.

Over the years sanitation seems to have acquired a low priority in popular perception in our country

particularly in rural areas. After independence the Government has made attempts for safe disposal of human excreta by cesspools, open ditches and bucket system. Today it involves adoption of flush latrine, hygienic practices in personal and domestic life, waste water disposal and solid waste disposal (Patel, 1995).

B. Factors Affecting Environmental Canitation

Man may be called the product of the interaction between his inborn properties and his environment. The physical environment of man consists of both of natural and artificial factors such as temperature, humidity, rainfall, air, water, soil, human, animal and industrial wastes, smoke and dust. The major factors of environmental sanitation are considered as water supply, air ventilation, disposal of human wastes, refuse and the dead, housing and the sanitation of fairs and festivals (Ghosh, 1988).

Population and Poverty

Before considering all above factors, population explosion and its coincid poverty comes to the mind as the major factors which affect environmental sanitation. India is the second largest populous country (920 million) and is the home of 16 per cent of worlds' population. (Government of India, 1996). The unrestricted population growth tend to impose a strong constraint on the standard of living,

happiness and even survival of mankind through the spiralling consumption of the fixed quantity of resources and abundant amount of wastes released.

Biswas (1987) and Verma (1988) state that poverty is one of the main cause of environmental problems especially in marginal settlements where the people live without essential requirements such as pure water, shelter, clothes and food. Minimal sanitation facitlities have created a number of acute environmental problems. Poverty and ignorence are the twin enemies of the society and elimination of these must be the goal of any developmental policy. As work and well being is fundamental to life, great efforts must be taken to alleviate poverty to reduce the extent and severity of unsanitation (Devadas, 1983; Rao, 1988).

Water Supply

Devi (1997) opines that water is one of the most vital factors in the existence of living organisms, which affect on environmental sanitation.

Water is not only indispensable for physical activities but also has a sociological role related to various human activities, such as bathing, washing, cooking, cleaning, drinking, agriculture and industry. Water that is free from disease producing microorganisms and chemical substances which are deleterious to health is called potable

water. The water for drinking should be free from taste, odour, harmful chemicals, turbidity and microorganism. Since the raw water sources are usually polluted to some extent now-a-days, a number of diseases can be contracted by human beings, if the water is not made free of harmful microorganisms, by the treatment process.

Trivedy and Goel (1987) and Sudha and Vijayavathi (1996) are of the opinion that water intended for human consumption should be safe and wholesome. It is contaminated when it contains infective and parasite agents, poisonous chemical substances, industrial or other waste or sewage. Poor quality has a directly detrimental effort on human health. Hence the quality of water is of paramount importance for the sustenance of life. Choudhury, (1996) opines that water is life and sanitation is a way of life. Both are critical for improvements in the quality of life and health. Safe water and environmental sanitation have been considered as two essential components for sound health (Bharadwaj, 1990 and Misra, 1996).

Wastes Disposal

The proper disposal of waste is next in importance. House refuse may be divided into three types - household waste such as paper, dust, kitchen waste, waste water from house cleaning, washing and cooking, and body

wastes that is excreta, which includes urine and faeces. If any of the above are allowed to accumulate in the house, it becomes unhealthy, unsighty, and stinking. (Educational Planning Group, 1990 and Rosenbaum, 1991).

Solid wastes disposal in urban as well as in rural areas is a serious problem. Due to rapid increase in population the amount of solid wastes that must be regularly collected, transported and ultimately disposed off has increased tremendously in recent years. In addition, uncontrolled dumping of garbage destroys the beauty of the surrounding and burning of these wastes causes air pollution due to release of a variety of pollutants depending on the waste composition and combustion conditions (Chaudhuri and Nag, 1983 and Rao, 1991).

Disposal of raw or partially treated sewage is the most important factor in microbial pollution. The E.Coli and a number of pathogens reach water resources through sewage (Mohan, 1988). Waste water from municipalities are increasing due to expanding population and greater per capita water usage. The growth rate of industrial waste water discharge is greater than that for municipal discharge (Trivedi and Raj, 1992 and Salorkinkop, 1998).

Housing

Housing meets the physical needs of people by

providing shelter from the extremes of weather, a place to eat, to sleep and to store possessions. Throughout the history, shelter has been an important consideration in fulfilling human needs. The homes are a place of safety , a refuge families also aquate shelter with a sense of identity. Shelter is necessary to maintain the well being of the family (Jackson, 1993 and Devi, 1997). As Chauhan (1997) points out housing creates a solid base for healthy and hygienic living.

Satake and Katwal (1989) consider that the arrangement of house in the villages and towns is also important for good environmental sanitation. Poor housing condition, unfortunately exist, there is lack of proper ventilation and often inadequate window space. Families may have to share a water supply and therefore store water in the house, which is undesirable when rooms are badly ventilated and stuffy, too hot and personal washing facilities lacking then disorders particularly respiratory infection, communicable disease and skin infection, spread rapidly (Sharma, 1997). Bad housing is associated with ill-health, hazardous to life and property, increased deliquency and low real estate values.

Personal Hygiene

Personal hygiene includes the care and attention necessary for the body and its clothing to maintain a

standard of cleanliness essential for good health and social acceptance. Lack of attention of this details will lead to indifferent health, infectious, poor appearance and unpleasantness (Moloney, 1996).

According to Anderson (1991), Hygiene is the science of health. The principles of hygiene (hy-jeen) apply chiefly to our way of living. These principles have to do with cleanliness, food, exercise, rest, clothing, shelter and social behaviour.

Cleanliness means clean bodies and clean mind more than that it means clean fresh air to breath, clean food to eat, clean clothes to wear. And it means clean homes, clean streets, clean playgrounds, clean schools, clean public buildings and clean things to work with. No matter how sound our bodies are, we cannot be sure that disease germs will not infect us, yet clean hands, clean mouths, clean breathing passages and clean eyes are dependable safeguards against disease (Devadas, 1983).

Pollution

Diwan (1987) states that healthy environment is the most essential prerequisite of human life. All components of environment like air, water, soil, and noise are so sadly affected by the pollutants that the whole environment has been polluted. All aspects of pollution are

directly or indirectly related to human health and well being. (Srivastava, 1989 and Rao, 1991).

Mohan(1988) opines that in India the main source of water pollution are community wastes from human settlements, industrial effluents, agricultural pollutants and physical pollutants(heat and radioactive substance). It is responsible for wide spread breeding of typhoid, paratyphoid, dysentery, cholera, infectious hepatities, gastroenterities and many more.

The environmental pollution can be attributed by several factors like urbanisation, industrialisation, automation, unsound planning and lack of general awareness in the mass. Though the environmental problems have many facets, the pollution of water, air and land is one of the most pressing environmental problems in India (Mathur, 1983).

C. Health Hazards of Poor Sanitation

Expectation of life in many poor countries is barely half of what most of the people enjoy in the rich industrial world. That half of life that people lose, they lose for many reasons, but a significant number are a direct result of poor sanitary conditions (Pacey, 1978).

Sivananda (1989) opines that eighty per cent of all diseases in developing countries is directly related to

poor drinking water and insanitary conditions. Most of the preventable disease are entirely due to the insanitary condition of the villages. The people of the village are ignorant about the elementary principles of hygiene.

Safe drinking water and sanitation have been proven to be essential to good health and while the availability of water is a prerequisite for socio economic development, there also exists a cause and effect relationship between water, sanitation, health and development. These four elements form a complex system which will decide the course of future events. This relationship is evident in the WHO statistics which show that 80 per cent of all diseases are due to inappropriate use of water and poor environmental sanitation facilities which include lack of disposal facilities of human waste and solid materials (Durgaprasad, 1996). Cholera, dysentery, gastroenteritis, hepatitis, typhoid and polio are the most common epidemics spread through water (Nair and Ravindran, 1984 and Kurup, 1994).

Due to poor waste management systems, indiscriminate solid waste pose serious health risks in surface water supplies (Sharma, 1997). Sewage is always a possible source of contagious disease. Sewage may carry germs that produce typhoid fever, tuberculosis, cholera, dysentery and diarroea. It is necessary therefore to dispose of the water and wastes carried by the sewer pipes so as not to create a health problem. (Khan et al., 1997).

Air pollution can be by dust, smoke, toxic gases and chemical vapour which may also result in sickness and death. Water pollution leads to disease like cholera, typhoid, dysentery, worm infection etc (Kudesia, 1986).

According to Rao (1991) improper handling of solid waste is a health hazard and causes damage to the environment. The main risks to human health arise from the breeding of disease vectors primirily flies and rats. A common transmission route of bascillary dysentery, amoebic dysentery and diarrhoeal disease in India is from faeces by flies to food and water and then to human (Verma, 1988). The alarmingly high mortality rate of infants is attributed largely to poor sanitation (Pauchauri, 1994).

The environmental crisis affects every person living in the area and it implies the deterioration of environment in which we live. The environmental deterioration may be caused by single or interactive effects of the several sources of environmental pollution like air, water, food, pesticide, contamination, forests and wild life, solid wastes and noise (Diwan, 1987).

D. Measures to Improve Environmental Sanitation

The Government of India taking immense effort to improve the sanitary conditions and thereby increasing the

standard of living of the community. Some of the main agencies involved in promoting environmental sanitation and health in India are given below:

Centrally Sponsored Rural Sanitation Programme

This was started in the year 1954 with an objective to provide basic sanitation facilities to all the rural and urban population. It provides subsidies for the construction of latrines for the rural people living below poverty line and the general public. During 1995 - 96, target was construction of 8,70,289 sanitary latrines in the central and state sectors against which the achievement is of 6,89,243 (Provisional).

The total outlay of Rs.380 crore for the Centrally Sponsored Rural Sanitation Programme has been provided during the Eighth Five Year Plan. (Government of India, 1996).

Minimum Needs Programme (MNP)

This was introduced in the first year of the fifth five year plan (1974-87). The objectives of the programmes is to provide certain basic minimium needs and thereby improve the living standard of the people. Rural health, water supply and environmental improvement of slums are some of the main component included in this programme (Juithey, 1994).

National Water Supply and Sanitation Programmes

The National Water Supply and Sanitation Programme was initiated in 1954 during first five year plan with the object of providing safe water supply and adequate drainage facilities for the entire rural and urban population of the country. It has taken a great effort and provided safe water for 80 per cent of the urban and 47 per cent of the rural population and adequate facilities for waste disposal to 30 per cent of the urban and 1.0 per cent of rural population (WHO Report, 1986).

Council for Advancement of Peoples Action and Rural Technology (CAPART)

CAPART was registered under the societies Registration Act 1860 on 1st Sep. 1986. It aims at encouraging, promoting and assisting voluntary action for enhancement of rural prosperity. CAPART makes available financial assistance to voluntary organisation to improve sanitation under the following schemes, Accelerated Rural Water Supply Programme (ARWSP), Central Rural Sanitation Programme (CRSP) JRY consisting of watershed conservation and development programme, village link road, rural housing and social forestry (Government of India, 1995).

Low Cost Sanitation Programme

The low cost sanitation programme both for small

and medium towns, fringe areas of the cities and rural areas in the country has been given high priority in the sanitation sector in India. In the low cost sanitation project individual and community latrines are constructed according to the need and at present 8 agencies are involved directly or indirectly in the implementation of low cost sanitation programme and rehabilitation of scavengers in the country (Dutta, 1989).

National Drinking Water Mission

National Drinking Water Mission was launched in 1986 to give a sense of urgency to the task of covering all problem villages by 1990. Under this 55 Mini Mission have been put into operation to the most difficult parts of the country.

Rajiv Gandhi National Drinking Water Mission Authority

The Government had set up Rajiv Gandhi National Drinking Water Mission (RGNDWM) Authority under the chairmanship of the Prime Minister. The authority will provide policy framework, review the progress of implementation of the various programmes of the mission and issue proper direction for effective implementation of rural water supply programmes.

Many of the environmental pollution problems can

be solved with the available technology, but unfortunately the efforts being made are badly managed and inadeaquate in India. In order to ensure environmental protection Government of India has made some administration and legislative arrangements. A department of environment has been created with a wide range of responsibilities and many state level organisations are being set up. The major central laws include: the Wild Life Prtection Act of 1972, the Water (prevention and control of pollution) Act of 1974, the Air (Prevention and Control of Pollution) Act of 1981 and the New environmental (Protection) Act of 1986. (Rao, 1991)

United Nations Children's Fund

Since 1976, UNICEF has been participating in Urban Basic Services (UBS) which has the aim to upgrade basic services (eg. health, nutrition, water supply, sanitation and education) in selected cities and towns. In response to UN sponsored water supply and Environment Sanitation Decade (1981 -90) the Government of India has set targets of achieving 80 per cent sanitation coverage of the urban and 25 per cent coverage of the rural population in 1990 (UNICEF, 1993).

World Health Organisation

The present objective of WHO is the attainment of health for all by 2000 AD. Promotion of environmental health

is always an important activity of WHO. It advises and helps the governments on national programmes for the provision of basic sanitary services.

The agencies servicing in Assam State sector are: Pollution Control Board (APCB); Pakriti - a Voluntary Organisation; Nagaon , Eco Club; Assam Science Sopciety and Society for Environmental Protection , Assam (SFPA) , (APCB News Letter, 1994 and Phukan, 1997).

Methodology

III DESIGN OF THE STUDY

The methodology pertaining to the study entitled "Assessing Environmental Sanitation of Rural Households in Assam" includes the following steps:

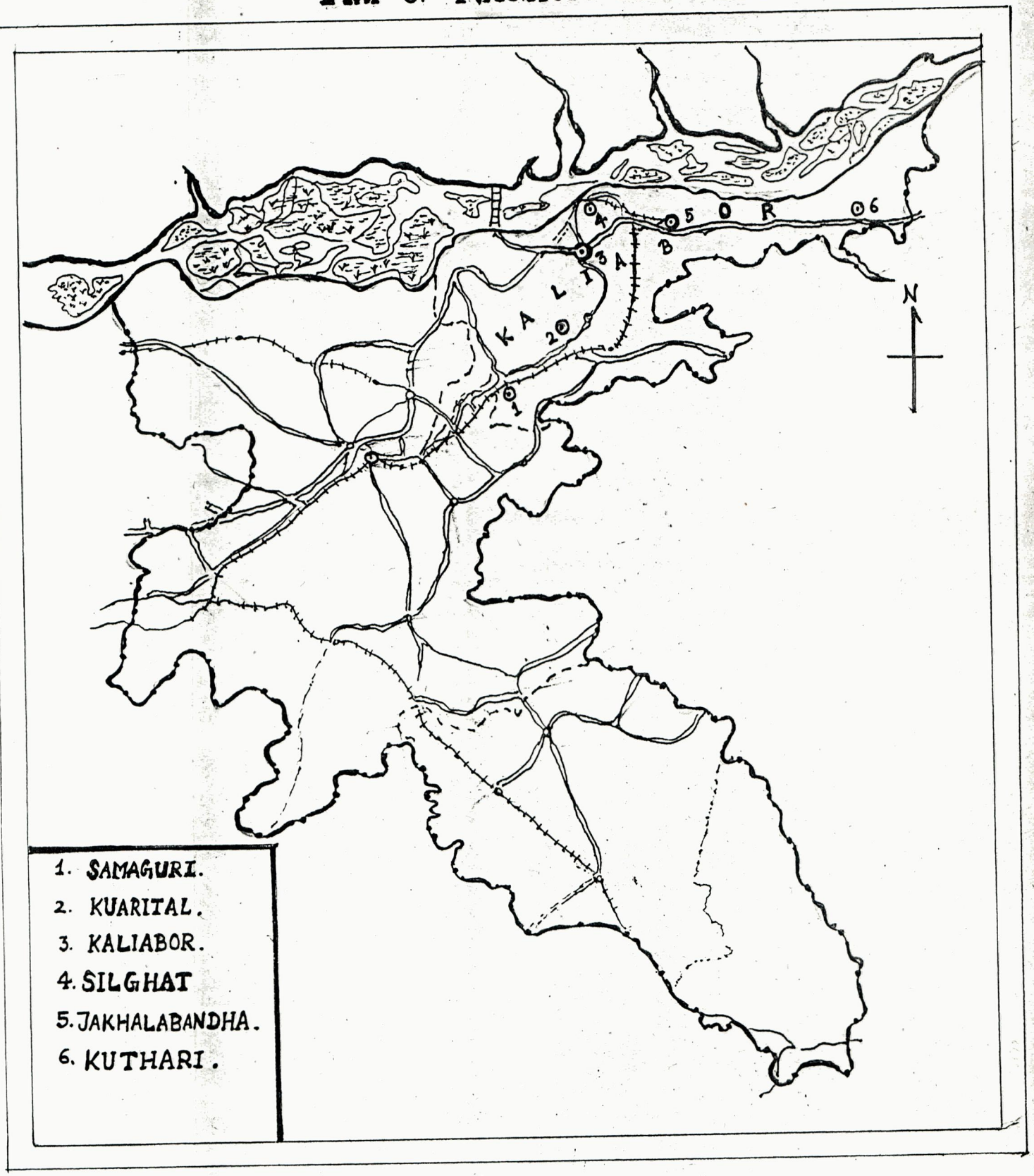
A. Selection of Area
B. Selection of Sample
C. Selection of Method
D. Formulating and Finalising the Tool
E. Collecting and Presenting Data

A. Selection of Area

The study was conducted in the area Kaliabor of Nagaon District, located in the middle of Assam. The total population of the district was 18,93,171 with 9,11,792 male and 9,81,379 female (Deputy Director's Office, Nagaon, 1991 census). The total population of the area Kaliabor was 1,46,734 with 76,256 male and 70,478 female (Kaliabar Development Block, 1991 census). This locale was selected because no previous study had been conducted relating to the environmental sanitary condition. The availability of the required samples and easy approachability and accessibility to the investigator being a native of Assam were the other reasons for the choice. Figure 1 shows the locale of the study.

MAP OF NAGAON DISTRICT

24



LOCALE OF THE STUDY.

Fig - 1

25

B. Selection of Sample

Rural homemakers were chosen as samples for this study. The success of any study depends on the careful selection of the sample. There were more than 500 households within those selected villages. Among these 100 households were selected for the conduct of the study by simple random sampling method. Simple random sampling is a technique in which each and every unit of the population has an equal opportunity of being selected in the sample (Gupta, 1995).

C. Selection of Method

Interview cum observation method was chosen for collecting information because of its convenience, comprehensiveness and possibility of obtaining genuine information. An interview is one where a list of questions or statements relating to the investigation is prepared and these questions are put to the selected group and their answers are recorded by the interviewer (Chaudhary, 1991).

Cohen and Lawrence (1985) state that interview is a two persons conversation initiated by the interviewer for the specific purpose of obtaining relevant information and focussed by him on content specified by research objectives of systematic description, prediction or explanation.

The observation method was used to observe things

in and around the households. Observation is a scientific tool and the method of data collection for the researcher, when it serves a formulated research purpose, is systematically planned and recorded and is subjected to checks and controls on validity and reliability. Under this method, the information is sought by way of investigator's own direct observation without asking from the respondent (Kothari, 1997). The investigator observed the interior and exterior cleanliness and the facilities available in and around the houses.

D. Formulating and Finalising the Tool

The adequacy of the schedule was also tested through a pilot study. Sadhu et al., (1992) state that pre-test provides not only a test of clarity of questions and correctness of interpretation put upon them by the respondents, but also affords the possibility of discovering aspects of study which are not anticipated in the planning stage. A pilot study was conducted among 10 rural households for pretesting the schedule. The modifications in the schedule were incorporated based on the pilot study. The modified schedule is given in Appendix I.

E. Collecting and Presenting Data

The survey was conducted to collect the data which

helps to get a dependable and reliable data. Sidhu (1989) opines that it is a dynamic, interpersonal experience that is carefully planned to accomplish a particular purpose. A personal sensitive and appreciative attitude is very important if rapport is to be established and maintained throughout the survey. After establishing a good rapport the purpose of the study was explained and information was collected from the selected households by the investigator using the interview schedule.

The collected data were consolidated, tabulated analysed and discussed under the Chapter "Results and Discussion.

Results and Discussion

IV RESULTS AND DISCUSSION

The results of the study on "Assessing Environmental Sanitation of Rural Households in Assam" consists of the following aspects:

A. Socio-economic Profile

B. Details on Sanitary Conditions

C. Knowledge on Environmental Problems

D. Suggestions to Improve Sanitation

A. Socio economic Profile

The socio-economic profile of the selected families includes details on type of family, size of family, age, educational status, occupational status and monthly income.

1. Type of family

From the study it was found that 80 per cent of the families were nuclear families, where as only 20 per cent preferred joint family system. The present living condition, pursuit of different types of occupation and current socio-economic trends might have influenced the possible option for nuclear families.

2. Size of family

Table I presents the details on size of family.

TABLE I

SIZE OF FAMILY

Family size *	Percentage of families
Small family (2-4 members)	28
Medium family (5-7 members)	69
Large family (7 and above members)	3

*Hurlock (1985)

It is encouraging to note that 28 per cent belonged to small family which reflects the realisation of the need for limiting the family size by the families intune with the small family norms of Government of India. A highest proportion (69 per cent) of families belonged to medium size family which shows that still more efforts should be taken by the Government to reduce the family size. Now a days even in rural areas large famililes seldom exist.

3. Age of heads and homemakers

The distribution of the heads and homemakers according to age is given in the Table II.

TABLE II

AGE OF HEADS AND HOMEMAKERS

Age (in years)	Percentage of	
	Heads	Homemakers
15 - 24	-	11
25 - 34	13	42
35 - 44	42	24
45 - 54	21	20
55 - 64	22	3
65 - 74	2	-

The heads of the families were mainly between the age group of 35 and 44, with a domination of 42 per cent, where as only 2 per cent were under the age group of 65 to 74 among the selected families. It is obvious that 42 per cent of homemakers were under the age group of 25 to 34 years that means the major portion of homemakers were young. A very small portion (3 per cent) of homemakers were under the age group of 55 to 64 years, whereas 11 per cent were under 15 to 24 years. This shows that the early marriages still exist in rural areas.

4. Educational status

Education is one of the major parameters to determine the general socio-economic profile of any society. The educational status of the heads and homemakers is presented in Table III.

TABLE III

EDUCATIONAL STATUS

Educational level	Percentage of	
	Heads	Homemakers
Illiterate	2	3
Primary	18	14
High School	51	54
Higher Secondary	15	20
Graduate	10	8
Post graduate	2	1
Professional	2	-

It is encouraging to note that more than 97 per cent of heads of the family and homemakers were educated, who realised the importance of education. More than half of the heads (51 per cent) and homemakers (54 per cent) studied up to high school level. Ten per cent heads and 8 per cent of homemakers were graduates. Only very few completed post graduation and professional course. Importance of educating women was very much realised by the selected families because very few women were illiterates.

5. Occupational status

Occupational status of any family is a major factor to decide the standard of living of the family. The occupational status of heads and homemakers is shown in Table IV amd Figure 2.

TABLE IV

OCCUPATIONAL STATUS

Occupation	Percentage of	
	Heads	Homemakers
Fulltime homemaker	-	84
Agriculture	43	5
Business	12	2
Teacher	13	5
Government employee	26	4
Other	6	-

A majority of 43 per cent of heads of the families were agriculturists. A majority of 84 per cent of homemakers were full time homemakers (not gainfully employed). Twenty six per cent of heads were government employees and 13 per cent were teachers, where as ony 4 per cent of homemakers were government employees and 5 per cent were teachers.

Agriculture was the major occupation of the selected famililes. The homemakers engaged themselves in their own farms. Hence outside employment was very less among selected families.

6. Monthly income

Income is a vital factor which affects the living condition of any family. The monthly income of the families is shown in Table V and Figure 3.

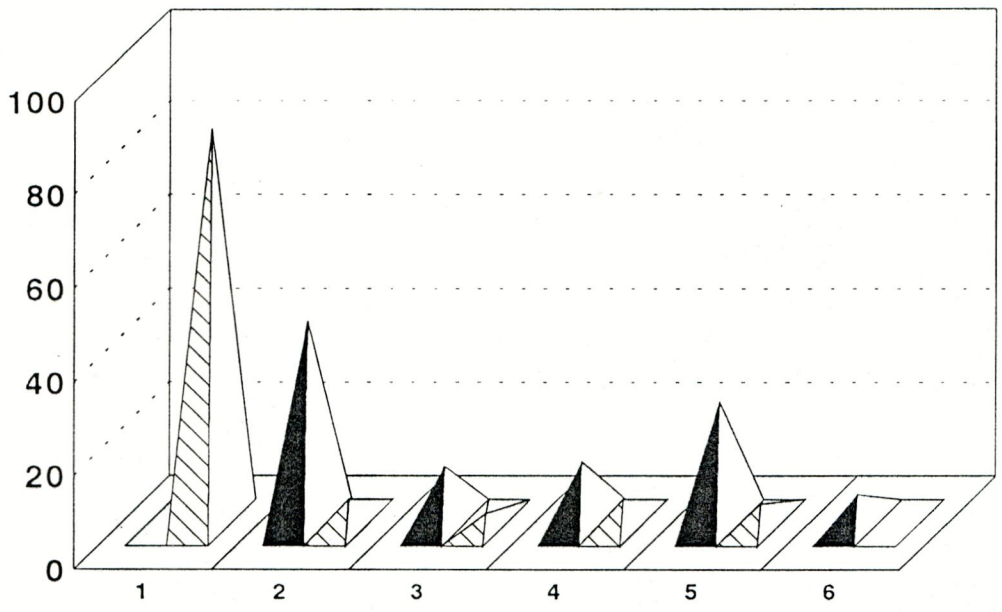


Fig. 2

1. Fulltime homemaker
2. Agriculture
3. Business
4. Teacher
5. Government employee
6. Other

TABLE V

MONTHLY INCOME

Income* (in Rs.)	Percentage of families
Low income (Below Rs.2000)	15
Middle income (Rs.2001 to Rs.6000)	71
High income (Above Rs.6000)	14

*HUDCO (1996)

A majority of selected families (71 per cent) belonged to middle income group earning Rs.2000 to Rs.6000 per month. Fifteen and 14 per cent of the selected families belonged to low income group and high income group respectively. Size of the land possessed by the families decided about the amount of income they earned.

B. Details on Sanitary Conditions

This aspect is dealt under personal hygiene and condition of living environment.

1. Personal hygiene

To be kept in sound health and working condition the human body should be treated with certain amount of regular care and attention which is called as personal hygiene. Almost all the families felt that personal hygiene was necessary for healthy living. They had little knowledge regarding the personal hygiene activities. Table VI shows the activities and their frequency of performance.

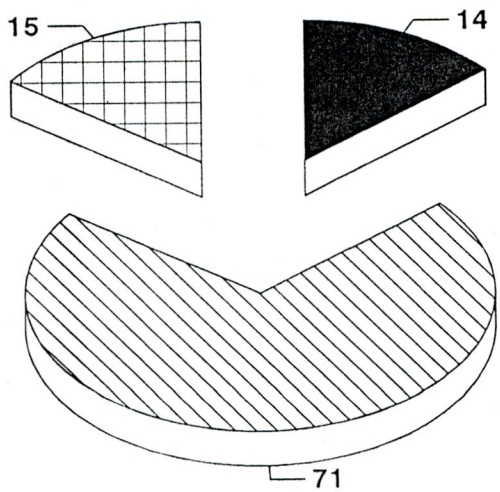

15
14
71
Low income(<2000)
Middle income(2001-6000)
High income(>6000)
Monthly income

Fig. 3

TABLE VI

PERSONAL HYGIENE ACTIVITIES AND FREQUENCY OF PERFORMANCE

Activities	Percentage of Homemakers*			
	Daily	Frequently	Occasionally	Rarely
Washing hands before and after meals	94	5	1	-
Taking bath	93	7	-	-
Cutting the nails	-	90	10	-
Putting up hair while cooking	100	-	-	-
Combing hair	100	-	-	-
Putting oil to hair	37	37	20	6
Brushing teeth	100	-	-	-
Wearing clean clothes	85	15	-	-
Washing undergarments	62	37	1	-
Washing hand with soap after toileting	35	43	13	9

* Multiple response

It is clear from the above Table that as far as personal hygiene is considered most of them were well groomed with hygienic habits. All the homemakers performed their activities daily such as putting up hair while cooking, combing hair and brushing teeth.

2. Condition of living environment

The living environment is the sum total of external and internal condition which influence the life of the individual, the family and the community.

The enviromental condition were studied, observed, analysed, presented and discussed under domestic environment, sanitary facilities and health status.

a. Domestic environment

This aspect is discussed under the following sub headings as details about house, interior environment and exterior environment.

i. Details about house:

According to Park and Park (1995) housing is a part of the total environment of man and being a part, it is to some extent responsible for the status of man's health and well being. This aspects includes type of house, size of house, materials used for house construction, condition of the room and facilities in the house.

Type of house:

Ninety eight per cent of the families lived in their own houses, only 2 per cent of them were in rented houses. Most of the families had their own land along with their dwelling. This might be because of the low density of population in Assam.

Size of house:

Table VII shows the size of house with reference to the income level of the selected families.

TABLE VII

SIZE OF HOUSE

Income (in Rs.)	Percentage of families: Recommended size of the house for		
	Low Income upto 60 sqm	Middle Income 61 sq - 120 sqm	High Income above 120sqm
Low Income Group (Below Rs.2000) N=15	80.0	20.0	-
Middle Income Group (Rs.2001 to Rs.6000) N=71	33.8	66.2	-
High Income group (Above Rs.6000) N=14	14.3	71.4	14.3

From the above Table it is distinct that 80.0 per cent of the families of low income group had the standard size recommended for low income group houses (upto 60 sq mt). A majority of 66.2 per cent of middle income group families had the size recommended for middle income group houses (61 sq.mt t0 120 sq.mt). Even the high income group families (71.4 per cent) possessed the house with the recommended size for middle income group families. The families living in farm houses did not give much importance for size of the house.

Materials used for house construction

Table VIII and Figure 4 show the materials used for construction of houses among the selected families.

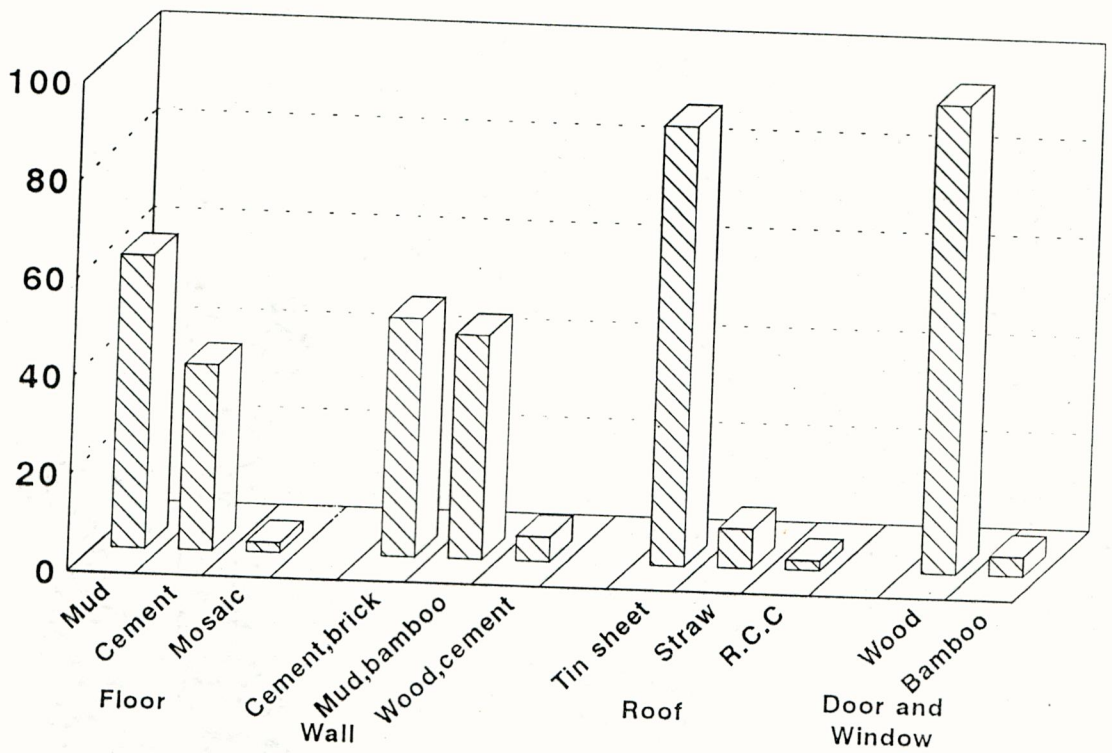
TABLE VIII

MATERIALS USED FOR HOUSE CONSTRUCTION

Materials		Percentage of families*
Floor		
	a. Mud	60
	b. Cement	38
	c. Mosaic	2
Wall		
	a. Cement, brick	49
	b. Mud, bamboo	46
	c. Wood, cement	5
Roof		
	a. Tin sheet	90
	b. Straw	8
	c. RCC	2
Door and Window		
	a. Wood	96
	b. Bamboo	4

*Multiple response

From the above Table it is distinct that most of the families used cement as the basic material for walls (49 per cent) and floors (38 per cent). Two per cent used cement for roof as Reinforced Cement Concrete (RCC). The next very widely used material was mud for walls (46 per cent) and floors (60 per cent). Most of the houses (46 per cent) used bamboo as basic wall material and on the bamboo sheet they applied mud plaster as wall finishe. Four per cent families used bamboo for doors and windows because it was very cheap and much available in the local area.



Materials used for house construction

Fig. 4

Ninety per cent of the families used Tin sheet as roofing material whereas 8 per cent used the cheap and easily available straw. Because of the climatic condition most of the families prefer tin sheet as roofing material which gives a neat and clean appearance to the house and some extent warmth inside the house.

As wood was available in the locality 96 per cent of families used wood for doors and windows and only 5 per cent used wood for wall construction. Basically wood was used in almost all the houses as basic housing material because of its availability and low cost. Plate I shows the materials used in house construction.

Condition of the rooms:

In 50 per cent of the families rooms were in good condition and 8 per cent of families the condition of the rooms were poor. Rest of the families' rooms were in fair condition.

Facilities in the house

The facilities available in the houses are shown in the Table IX.

PLATE 1 MATERIALS USED IN HOUSE CONSTRUCTION

TABLE IX

FACILITIES IN THE HOUSE

Facilities	Percentage of families*
Seperate kitchen	100
Seperate bathroom	96
Adequate ventilation	77
Adequate lighting	75
Water supply inside the house	4

* Multiple response

It was a good sign that all the selected households had a seperate kitchen eventhough only 96 per cent families had a seperate bathroom. Again only a very small number of families (4 per cent) had provision for water supply inside the house because most of the families had seperate water source just outside the house. Only 75 per cent of families had adequate lighting and 77per cent had adequate ventilation because the type of house constructed was such that with less number of doors and windows.

ii. Interior environment

The interior environment of the house determines the living standard of the family. This aspect includes cleanliness of interior environment, type of chulah, frequency of cleaning the house and pest problem in the house.

Cleanliness of the interior environment.

Table X , Figure 5 and Plate II depicit the cleanliness of the interior environment of the house.

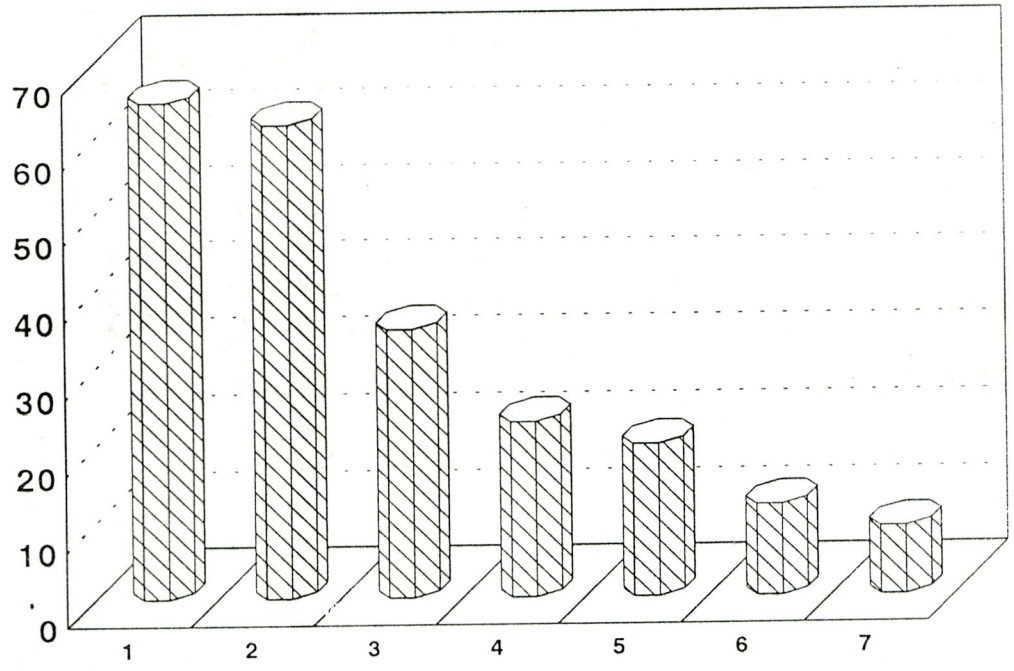
TABLE X

CLEANLINESS OF THE INTERIOR ENVIRONMENT

Conditions	Percentage of families *
Clean interior	65
Dirty doors and windows	62
Faulty arrangement of articles	35
Dumping of articles	23
Hanging clothes	20
Dirty wall and floors	12
Ceiling with cobwebs	9

*Multiple response

From the above Table it is obvious that the cleanliness of the interior environment of the households were not up to the standard though 65 per cent had clean interior. Sixty two per cent of households were with dusty doors and windows. Thirty five per cent of the households were with faulty arrangement of articles followed by 12 per cent with dirty walls and floors. The dumping of dirty clothes (23 per cent) and the throwing of artilcles without proper maintenance in the selected households were observed by the investigator.



Cleanliness of the interior environment

Fig. 5

1. Clean interior
2. Dirty doors and windows
3. Faulty arragement of articles
4. Dumping of articles
5. Hanging clothes
6. Dirty walls and floors
7. Ceiling with cobwebs

PLATE II CLEANLINESS OF INTERIOR ENVIRONMENT

Types of chulah

Eighty per cent of the households had traditional chulah for cooking using wood and bamboo as fuel. Eighteen per cent of the households had L.P.G. Gas stove. Eventhough Government introduced many smokeless chulah programmes in rural areas the presence of smokeless chulah was negligible. Only two per cent of the households had smokeless chulah. Plate III visualizes the types of chulah. Among them only 7 per cent of them had smoke outlet. Lack of proper ventilation caused smoke accumulation inside the house leading to irritation of eyes and nose.

Frequency of cleaning of house

Seventy three per cent of the selected households cleaned their houses daily, and 24 per cent of them cleaned twice in a week. Only three per cent of households cleaned their houses once in a week. As daily cleaning is preferable for all houses it was not seen among the selected houses.

Pest problems in the house

Ninety four per cent of households had the problem of pest in and around the houses. The pest control measures adopted by the selected families are shown in Table XI.

FLOOR LEVEL CHULAH

STANDING LEVEL CHULAH

SMOKELESS CHULAH

LPG GAS STOVE

PLATE III TYPES OF CHULAH

TABLE XI

PEST CONTROL MEASURES

Measures	Percentage of families*
Mosquito net	100
D.D.T.	74
Kerosene	20
Bagon spray	10

*Multiple response

It is surprising to note that all selected families used mosquito net to get rid of mosquitoes at night. Seventy four per cent of families used D.D.T. and 20 per cent used kerosene as measures for controlling household pest like ants, cockroaches, mites and rats.

iii. Exterior environment

Condition of the exterior environment exhibits the hygienic living of a community. It is the near environment which surrounds the house. This aspect is discussed under cleanliness of exterior environment and utilisation of the space around the house.

Cleanliness of exterior environment

The cleanliness of exterior environment is shown in the Table XII.

TABLE XII

CLEANLINESS OF EXTERIOR ENVIRONMENT

Condition	Percentage of families*
Clean front and back yard	70
Clean exterior walls	66
Growth of unwanted plant	35
Stagnation of water	21
Waste on the road side	16
Scattered garbage	12

*Multiple response

From the above Tabe it is found out that the cleanliness of the exterior environment of selected households was not upto the standard. Clean front and back yard (70 per cent) and clean exterior walls (66 per cent) were the major enlightning observation made in the surroundings of the houses. The exterior of 35 per cent of the households were unhygienic with the growth of unwanted plants. As the climatic condition was dry the stagnation of water (21 per cent) was not shown much as in other seasons. Waste on road side (10 per cent) and scattered garbage (12 per cent) acted as a breeding place for mosquitoes and flies.

Utilisation of space around the house

Ninety per cent of the families had space around the houses. The utilisation of space around the houses is shown in Table XIII and Figure 6.

TABLE XIII

UTILISATION OF SPACE

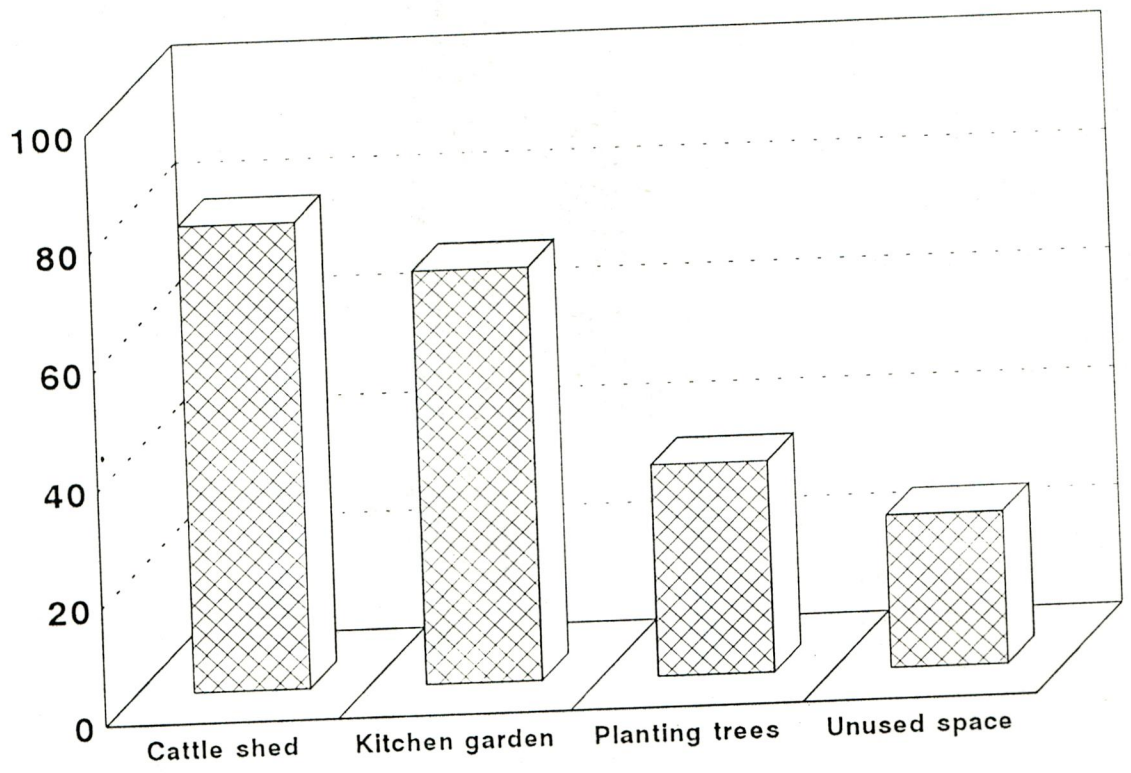
Use	Percentage of families*
Cattle shed	79
Kitchen garden	70
Planting trees	36
Unused space	26

*Multiple response

Since agriculture was the main occupation 79 per cent of families had cattle shed around their houses. Cattle rearing was taken up as a subsidary occupation to enhance the family income. Seventy per cent of families had kitchen garden in that few were small in size and few were big in size. According to the seasons prevailing in the area the utilisation of space differed. In winter season most of the households were interested in cultivating vegetable plants around their houses. The remaining families did not care for the space around the house. The condition was so poor and it had become breeding place for pest and rodents. Plate IV shows the utlisation of space around the houses.

b. Sanitary facilities

Improved sanitation leads to better health status and quality of life (Patel, 1995). This aspect includes information on water, drainage, bathing and latrine facilities and waste disposal.



Utilisation of space

Fig. 6

CATTLE SHED

KITCHEN GARDEN

PLANTING TREES

UNUSED SPACE

PLATE IV UTILISATION OF SPACE AROUND THE HOUSE

i. Water

No life is possible on this planet without the life giving water. This aspect is discussed under sources of water, location of water source, kind of water, time taken for collection of water, mode of collection and storage, handling of water and purification of water.

Sources of water

Table XIV and plate V show the sources of water to be used for various purposes by selected families.

TABLE XIV

SOURCES OF WATER

Source	Percentage of families
Common tap	60
Tube well	20
Individual well	16
Community well	4

Water being a necessity to human life was made available through the common tap for 60 per cent of the families. Among those households only 50 per cent of them got water from the common tap every day. The rest of the families had tube well (20 per cet), well (16 per cent) and community well (4 per cent) as water sources.

Location of water source

Most of the families (23 per cent)had to walk a long distance of nearly half a kilometer to bring water from

COMMON TAP

TUBE WELL

INDIVIDUAL WELL

COMMUNITY WELL

PLATE V SOURCES OF WATER

common tap. For 37 per cent of the families common tap was located very near. Rest of the families had tube well (20 per cent) and individual well (16 per cent) in their house premises and community well (4 per cent) near the houses.

Time taken for the collection of water

Most of the families (60 per cent) required 30-60 minutes for collection of water from nearest water sources. A few families (21 per cent) had taken more than 60 minutes, whereas 19 per cent of families needed less than 30 minutes for collection of water for various purposes.

Mode of collection and storage

A majority of 80 per cent of families stored water in plastic and aluminium buckets. The rest of the families used mud pots for storing water.

In general housewives were responsible for collection and storing of water. Sometimes their children, maid and husband would help them in collecting water.

Handling of water

As most of the selected families got water from common tap only a few families (34 per cent) used filter for filtering water. Among them 30 per cent families had commercial filter and 4 per cent had indegenous sand filter. More than 30 per cent of families used boiled and cooled water for drinking purpose.

Purification of water

Among the selected families 65 per cent were very much aware of bleaching powder as purifying agent because it was used by the water supplying authorities. Those who had individual well, used lime (4 per cent) and potash (3 per cent) to purify well water.

ii. Drainage facility

Drainage facility is very important in safeguarding health of the family members by keeping the surrounding clean. Only 11 per cent of families had open drainage facilities around the houses. Under ground drainage was not seen in the selected area eventhough enough space was available. Some of them had open drainage facility which was always blocked. Solid wastes thrown in the drain channel blocked the drain. Eventhough 11 per cent of families had drain channel to take away the waste water from the houses for few of them it was not a pucca constructed drainage line. The earth was dug out and the waste water was channalized to go away from the house. Plate VI shows the drainage facilities of the selected households.

iii. Bathing facility

To maintain personal cleanliness bathing facility is very much essential to every house which will help to lead a healthy hygienic life. It must provide privacy to some extend to take a proper bath along with their other activities in the houses. The bathing facilities available

OPEN DRAINAGE

DIG OUT DRAIN CHANNEL

BLOCKED DRAIN

PLATE VI DRAINAGE FACILITIES

among the selected households according to their income status are shown in the Table XV and Plate VII.

TABLE XV

INCOME VERSES BATHING FACILITIES

Facility	Percentage of families		
	Low income N=15	Middle income N=71	High income N=14
Kutcha enclosure near the house	86.7	47.9	-
Pucca bathroom near the house	-	49.3	85.7
Pucca bathroom inside the house	-	-	14.3
Near the community well	13.3	2.8	-

It is distinct that among the selected families many of them did not have proper bathroom for taking bath. When income increased importance for having seperate and proper facility for bathing was realised. A majority (85.7 per cent) of high income families had a pucca bathroom near the house and the remaining of them had inside the house itself. Eventhough 47.9 per cent of families belonged to middle income group, they had only a kutcha enclosure for bathing. Nearly 50 per cent of middle income families had a pucca bath room near the house. The low income families did not give much importance for bathing facility. This might be because of the low purchasing capacity. Thirteen per cent of

KUTCHA ENCLOSURE

PUCCA ENCLOSURE

PLATE VII BATHING FACILITIES

low income families and few middle income families did not mind to take bath near the community well. From this it can be concluded that income had great impact upon provision of facilities in the home.

iv. Latrine facility

A sanitary latrine is a must in all the houses to lead a hygienic life. Ninety two per cent of families had a latrine near the houses but most of them were not in good condition. This aspect includes type of latrine and maintenance of it.

Type of latrine

Only 41 per cent of families had pucca sanitary latrine with brick mosonry superstructure and tin or asbestose sheet roof. The remaining families had kutcha latrines. Among them 35 per cent of families had a pit dug and enclosed by bamboo sheet or straw as super structure without any roof (Plate VIII).

Maintenance of latrine:

The details regarding the maintenance of latrine include amount of water used for flushing the toilet, persons incharge for cleaning the latrine, materials used for cleaning and frequency of cleaning.

It was found out that a majority of families (57 per cent) used on an average 2-5 litres of water per person for flushing the toilet which was an adequate amount for

PLATE VIII TYPES OF LITRINE

cleaning after each use. The rest of the families used less than 1 litre of water per person which was not adequate.

In 61 per cent of families, homemaker took the responsibility of cleaning the toilet. In 25 per cent of families all members were responsible and six per cent of families employed a paid helper for cleaning the toilet.

Eighty two per cent of families used only ordinary brush or broom for cleaning where as 10 per cent used Harpic as cleaning material with brush.

Only 54 per cent of families cleaned their toilets daily and 27 per cent cleaned once in a week. For rest of them there was no particular frequency of time for cleaning toilet which showed that they did not give importance for hygienic practice.

v. Waste disposal

This includes disposal of solid and liquid wastes.

Disposal of solid waste

Table XVI highlights the methods of solid waste disposal by the selected dfamilies.

TABLE XVI

METHODS OF SOLID WASTE DISPOSAL

Waste	Percentage of families		
	Method of disposal		
	Manure pit	Feeding the animal	Throwing out
Vegetable peels	58	26	16
Left over foods	43	47	10
Packing material	49	-	51
Ash	51	-	49

It is interesting to note that a majority of families were aware of manure pit and disposed the solid wastes like vegetable peels (58 per cent), left over foods (43 per cent) packing material (49 per cent) and ash (51 per cent) in manure pit. Space available around the house might have been the reason for having manure pits. Few families used vegetable peels (26 per cent) and left over foods (47 per cent) for feeding their domestic animals. The remaining families indiscriminately threw the wastes on the back yard of their house or on the streets.

Disposal of liquid waste

Proper drainage facilities are important to keep the village clean. Table XVII shows the methods of disposal of liquid waste.

TABLE XVII

METHODS OF LIQUID WASTE DISPOSAL

Waste	Percentage of famiies		
	Method of disposal		
	Directed to kitchen garden	Directed to backyard	Road side
Kitchen waste water	45.7	54.3	-
Utensil washed water	37.7	62.3	-
Bathing water	18.5	60.5	21

As the selected families had enough space around the houses, they had small kitchen garden. Since they had kitchen garden the waste water like kitchen waste water (45.7 per cent), utensil washed water (37.7 per cent) and bathing water (18.5 per cent) was directed to kitchen garden.

c. Health status

According to WHO (1995) health is a state of complete physical, mental and social well being and not merely the absence of disease or infection. Health is never static, it is life long dynamic fusion. Table XVIII and Figure 7 highlight the general health problems faced by the members of selected families.

TABLE XVIII

GENERAL HEALTH PROBLEM

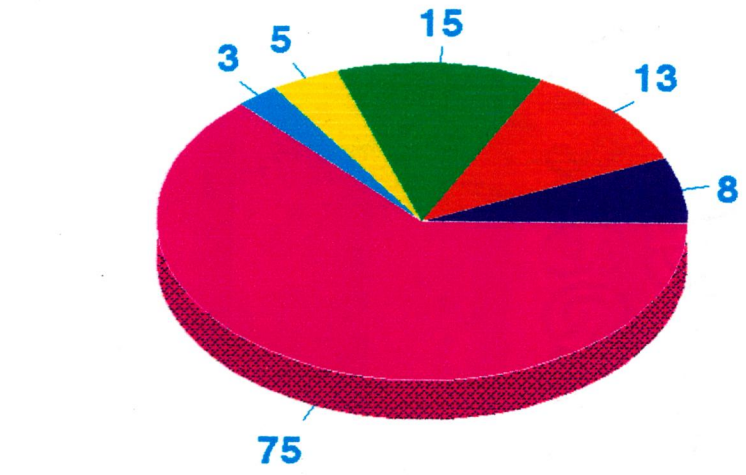
Problem	Percentage of families*
Diarrhoea	8
Dysentery	13
Worm infection	15
Jaundice	5
Insect borne disease	3
Cold and fever	75

*Multiple response

From the above Table it is distinct that high percentage (75 per cent) of the selected families suffered from cold, fever and other minor disturbances. Diarrhoea (8 per cent), dysentery (13 per cent) worm infection (15 per cent) jaundice (5 per cent) and insect borne disease (3 per cent) were also prevalent among the selected families.

The reasons for prevalence of these disease were ignorance of the people and lack of knowledge about the hygienic practices which should be followed to keep their house as well as themselves clean. Those who suffered from the above diseases followed unhygienic practices in cooking, eating, toileting and handling water for various purposes.

Among the selected families only 5 per cent of the families suffered from the major health problem such as jaundice during last 5 years.



General health problem

Fig. 7

C. Knowledge on Environmental Problems

The knowledge on environmental problems of the selected families are studied and discussed under meaning of environmental degradation, reasons for environmental degradation, individual's role in preventing environmental degradation and awareness on sanitary programmes.

1. Meaning of environmental degradation

Only 23 per cent of families had knowledge about environmental degradation. Rest of the families did not have any idea about the meaning of environmental degradation. Even though most of the families were educated, ignorance might be the reason for it. They indicated that pollution of air, water and soil as environmental degradation.

2. Reasons for environmental degradation

The reasons for environmental degradation as pointed out by the respondents were industries (8 per cent), automobiles (7 per cent) and deforestration (5 per cent). Few of them viewed that prevalence of disease (3 per cent) was the indicator of the environmental degradation.

This throws light on the fact that respondents were ignorant of all the other relative factors like unhygienic surroundings, congested living area, lack of rain, decrease in number of trees and animals and noisy surrounding which led to consequential environmental degradation.

3. Role of individual in protecting environment

Education alters the quality of life on the one hand and provides the basic knowledge for development and helps to realise the role of individuals in improving the living conditions on the other hand (Shah and Bhan, 1980).

The education of the homemakers were considered in finding out the impact on the realisation of individual's role in protecting environment. In the selected families most of them were more conscious about the individual's responsibility in protecting the environment. Table XIX highlights the impact of education in realising the individual's role in protecting environment.

TABLE XIX

EDUCATION VERSUS INDIVIDUAL ROLE

Role	Percentage of homemakers*					
	Illiterate N=3	Primary N=14	High school N=54	Higher secondary N=20	Graduate N=8	Post Graduate N=1
Keeping the domestic environment clean	66.7	28.6	88.9	100.0	100.0	100.0
Disposing waste properly	-	85.7	87.0	65.0	75.0	100.0
Following hygienic practices	-	35.7	79.6	50.0	62.5	100.0
Using sanitary latrine	-	64.2	74.0	60.0	75.0	100.0
Developing good health habits in children	66.7	85.7	79.6	70.0	87.5	100.0
Participating actively in Government programme	-	-	37.0	65.0	87.5	100.0
Motivating others to protect environment	-	-	55.6	30.0	50.0	-

*Multiple response.

From the above Table it is found that though the selected homemakers were not much aware of the meaning of environmental degradation, they were more conscious and aware of the individual's role in protecting the environment.

When education level increased the concept of keeping the domestic environment clean also increased. Illiterate homemakers were of the opinion that keeping domestic environment clean (66.7 per cent) and developing healthy habits among children (66.7 per cent) were the responsibility of individual in protecting environment. Eventhough they were of this opinion, in real sense they did not practice it. Higher the educational level the number of responsibilities realised were more and varied in nature. As the sample selected comprised of 97 per cent of educated homemakers, they were in a position to realise and indicate the responsibilities which should be taken by the individuals in protecting the environment.

4. Awareness on sanitation programmes

Only 10 per cent of selected families were aware of the existence of Society for Environmental Protection, Assam (SEPA) a non governmental organisation and Pollution Control Board, Assam (APCB) and not about the details of functioning of the organisations. Moreover so far no sanitation programme was implemented by the Government in the selected area as observed by the investigator.

D. Suggestions to Improve Sanitation

Selected families suggested that the government should help them to improve the sanitary condition in their areas. The suggestion was given in the form of expectations from Government.

* A majority of the families (69 per cent) expressed their need for latrines in their respective places.
* The existing latrines should be provided with adequate water supply for effective utilisation.
* The civic authorities should collect household wastes (22 per cent), and clean the common drainage regularly (30 per cent).
* The Government should construct proper drainage (46 per cent) wherever it is necessary.
* Technical and financial help should be provided to construct individual sanitary latrines (52 per cent).

Summary and Conclusion

V SUMMARY AND CONCLUSION

Environmental sanitation is imperative to improve the quality of life of people and enable them to lead healthy and satisfactory life. Improvement in environmental sanitation is an inevitable and immediate need of the day especially for the rural areas.

A rural area Kaliabor was selected for conducting the study on "Assessing Environmental Sanitation of Rural Households in Assam" to understand the existing environmental sanitary conditions, sanitary facilities available and assess the awareness on the concept of environmental sanitation.

A survey was conducted in 100 selected households by simple random sampling to assess sanitary conditions. Personal interview cum observation method was adopted and interview schedule was used as a tool for collecting necessary information. The findings are given below:

Socio economic profile of the selected families

The details gathered on socio economic background showed that 80 per cent of the families were nuclear families. A highest proportion of 69 per cent of families belonged to medium size families having 5-7 members. The age of the heads of the families were mainly between 35 and 44 years, with a domination of 42 per cent whereas 42 per cent of homemakers were under the age group of 25 to 34 years. More than 97 per cent of heads of the families and homemakers were literates. Among them majority were educated upto high

school level. A majority of 43 per cent of heads of the families were agriculturists whereas 84 per cent of homemakers were full time homemakers. A majority of 71 per cent of families belonged to middle income group earning Rs.2000 to Rs.6000 per month.

Details on sanitary conditions

As far as personal hygiene is considered most of them were well groomed with hygienic habits. Ninety eight per cent of the families lived in own houses. Even the high income group families (71.4 per cent) lived in the house with the size recommended for middle income group. Mud, wood and bamboo were commonly used as building materials because of their abundant availability and low cost. In nearly 50 per cent of the household rooms were in good condition. The cleanliness of the interior environment of the households were not upto the standard. Eighty per cent of the households had traditional chulah for cooking using wood and bamboo as fuels. Use of smokeless chulah was negligible. Only 73 per cent of the families cleaned their houses daily. As daily cleaning is preferable for all houses it was not seen among some of the households. All selected households used mosquito net to get rid of mosquitoes. Seventy four per cent used D.D.T. to control pest. The cleanliness of the exterior environment was not upto the standard. A majority of households had cattle shed (79 per cent) and kitchen

garden (70 per cent) in the exterior environment. All the selected households had a separate kitchen eventhough only 96 per cent households had a separate bathroom.

The sources of water for selected households were common tap (60 per cent), tube well (20 per cent), individual well (16 per cent) and community well (4 per cent). Most of the families (23 per cent) had to walk a long distance of nearly half a kilometer to bring water from common tap, whereas for 37 per cent of them, the common tap was located near by. A majority of 80 per cent of households stored water in plastic and aluminium buckets. As most of the selected families got water from common tap, only a few families (34 per cent) used filter for filtering water. Among the selected households 65 per cent were very much aware of bleaching powder as purifying agent as it was used by the water supply authorities. Only 11 per cent of households had open drainage facilities around the houses but under ground drainage was not seen in the selected area eventhough enough space was available. A majority of 85.7 per cent of high income families and nearly 50 per cent of middle income group families had a pucca bathroom near the house. Although 47.3 per cent of the household belonged to middle income group, they had only a kutcha enclosure for bathing. Ninety two per cent of households had latrine near the house but most of them were not in good condition. The

majority of the latrines were kutcha enclosures around the dugout pits. The pucca latrines were maintained properly than the kutcha enclosures. A majority of families disposed the solid waste in manure pit and the liquid waste was diverted to the kitchen garden. A high percentage of 74 per cent of the selected households suffered from cold, fever and other minor disturbances. Diarrhoea (8 per cent), dysentery (13 per cent), worm infection (15 per cent), jaundice (5 per cent) and insect borne disease (3 per cent) were also prevalent among the selected households.

Knowledge on environmental problems

Only 23 per cent of the families had knowledge about environmental degradation eventhough most of the families were educated. Ignorance might be the reason for it. They indicated that pollution of air, water and soil as the meaning of environmental degradation. The reasons for environmental degradation as pointed out by the respondents were industries (8 per cent), automobiles (7 per cent) and deforestation (5 per cent). As educational level increased the concept of keeping the domestic environment clean also increased. Higher the educational level, the number of responsibilities realised were more and varied in nature. Only 10 per cent of selected households were aware of the existance of Society for Environmental Protection, Assam (SEPA) and Pollution Control Board, Assam (APCB) and not about the details of functioning of the organisations.

Suggestions to improve sanitation

Selected families had given their suggestions to improve sanitation in the form of expectations from Government.

A majority of the families (69 per cent) expressed their need for latrines in their respective places. The existing latrines should be provided with adequate water supply for effective utilisation. The civic authorities should collect household waste (22 per cent) and clean the common drainage regularly (30 per cent). The Government should construct proper drainage (46 per cent) wherever it is necessary. Technical and financial help should be provided to construct individual sanitary latrines (52 per cent).

Conclusion

Government policies and legistlation alone cannot solve the environmental problem. The co-operation of the public is essential to improve environmental sanitation. The public is to be educated on the illeffects and environmental degradation and awareness should be created to abate it. The treat that poor sanitation poses to the health and welfare of the public is yet to be seriously taken even by enlightened citizens. It should be clear that with the present rate of growth of population, industrialisation and urbanisation, there is an urgent need for a holistic thinking on the improvement of environmental sanitation to prevent environmental degradation and to preserve mother earth.

Recommendation

* The rural families must be made aware of illeffects of poor sanitation and various programmes of the Government to improve sanitation through awareness programmes.
* The voluntary organisations should involve in awareness programme with the help of the Government and local authorities.
* Government should pay attention in constructing individual sanitary latrines than community latrines.
* People's representative should be involved in the planning as well as implementation stage of any sanitation programme, because lack of people's participation may lead to failure.
* The mass media like television, radio and films should give more importance to popularise the sanitation programmes among the public.

Further studies

* Awareness building studies for women and children can be conducted in different places.
* A training programme for selected women can be organised to create environmental awareness.
* A study can be taken up to evaluate the various sanitary programmes implemented by the Government.
* A project can be planned to develop simple reading materials in regional languages with enough visual representations to educate different group of people on environmental sanitation.

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Appendix

APPENDIX I

AVINASHILINGAM INSTITUTE FOR HOME SCIENCE AND HIGHER EDUCATION FOR WOMEN (DEEMED UNIVERSITY), COIMBATORE 641 043

AN INTERVIEW SCHEDULE TO ELICIT INFORMATION ON "ASSESSING ENVIRONMENTAL SANITATION OF RURAL HOUSEHOLDS IN ASSAM

I. GENERAL INFORMATION

1. Name of the Interviewer :
2. Name of the Interviewee :
3. Address :
4. Type of family : Nuclear [ ] Joint [ ]
5. Size of the family : Small (1-4 members)
   Medium (5-7 members)
   Large (above 7 members)
6. General details regarding the rural area:

   Name :
   Total population :
   Male :
   Female :

II. SOCIO-ECONOMIC BACKGROUND

S.No	Name	Age	Sex	Relation to Head of the Family	Educational status	Occupation

Income of the family :

Other sources of income : Amount in Rs/month

1. Regular income
2. Land
3. Rent
4. Any other

III. PERSONAL HYGIENE

1. Do you think personal hygiene is necessary to us ?

   Yes [ ] No [ ]

   Reason

2. Mention the activities which come under personal hygiene

3. Mention how frequently you carryout the following basic personal hygiene activities

S.No	Activities	Frequency				
		Daily	Frequently	Occasionally	Rarely	Never
1.	Washing hand before and after meals					
2.	Taking bath					
3.	Keeping nail short					
4.	Putting up hair while cooking					
5.	Combing hair					
6.	Putting oil to hair					
7.	Brushing teeth					
8.	Wearing clean clothes					
9.	Washing under garments					
10.	Washing hand with soap after toileting					

IV. CONDITION OF LIVING ENVIRONMENT

A. Housing

1. Housing ownership of occupied dwelling units:

S.No	Dwelling	Yes	No
1.	Owned		
2.	Rented		
3.	Other		

2. Interior:

a. Housing condition:

Room/ Area	Material used for finishes				Conditions of the room		
	Floor	Wall	Roof	Door Windows	Good	Fair	Bad

b. Dwelling with special facilities:

S.No	Facility	Yes	No
1.	Kitchen		
2.	Lighting		
3.	Ventilation		
4.	Water supply inside		
5.	Fixed bath or shower		
6.	Any type of sanitation system		

c. Condition of the interior environment:

S.No	Condition	Tick ( )
1.	Hanging clothes	
2.	Ceiling with cobwebs	
3.	Dumping of articles	
4.	Dusty doors and windows	
5.	Dirty wall and floors	
6.	Faulty arrangements of articles	
7.	Clean interior	

d. What type of stove do you use in your kitchen ?

1. Traditional
2. Smokeless chulah
3. Gas stove
4. Solar cooker
5. Any other

e. Do you have smoke outlet from your kitchen ?

Yes [ ] No [ ]

f. How often you clean/mop the rooms in your house ?

1. Daily
2. Twice a week
3. Once a week
4. Occasionally
5. Rarely

g. Do you have pest problems in and around your house ?

Yes [ ] No [ ]

If Yes, what are the measures you practice for controlling it ?

S.No	Measures	Duration
1.	D.D.T.	
2.	Kerosene	
3.	Bagon spray	
4.	Hit	
5.	Mosquito net	
6.	Pesticide	
7.	Any other	

3. Exterior

Utilisation of space around the house:

a. Do you have adequate space around the house ?

Yes [ ] No [ ]

If yes, how do you utilise the space ?

S.No	Particulars	Tick ( )
1.	Kitchen garden	
2.	Planting trees	
3.	Space not utilised	
4.	Cattle shed	
5.	Any other	

b. Clenaliness of exterior environment:

S.No	Particulars	Tick ( )
1.	Clean front and back yard	
2.	Clean exterior walls	
3.	Stagnation of water	
4.	Presence of sewage	
5.	Drainage water	
6.	Scatter of garbage	
7.	Waste in the roadside	
8.	Presence of human excreta	
9.	Industrial waste	
10.	Growth of unwanted plants	

c. How often do you clean your surrounding of the house ?

1. Daily
2. Twice in a week
3. Weekly
4. Rarely

B. Sanitary Facilities

1. Water

a. Do you have proper drinking water facility in your area ?

Yes [ ] No [ ]

If yes, Are you getting water everyday ?

b. Sources of water:

Purpose	Sources	Distance from the house	Time taken	Person incharge

c. Mention the mode of collection and storage and drinking water ?

d. Do you use filtered water for drinking purpose ?

Yes [ ] No [ ]

If yes, what type of filter you use ?

1. Sand filter
2. Natural filter
3. Commercial filter
4. Muslin cloth
5. Boiling
6. Any other

e. Do you use any water purifying agent in your drinking water source ?

Yes [ ] No [ ]

If yes, what they are

1. Potash
2. Bleaching powder
3. Addition of lime
4. Alum
5. Any other

C. Drainage Facility:

a. Do you have drainage system in your area ?

Yes [ ] No [ ]

If yes, is it open drainage or under ground drainage system?

D. Disposal of Waste:

a. Solid wastes

S.No	Solid wastes	Method of disposing
1.	Vegetable peels	
2.	Left over foods	
3.	Ash	
4.	Packing materials	
5.	Any other	

b. Do you have scavenging system ?

Yes [ ] No [ ]

c. Liquid waste:

S.No	Type of liquid waste	Method of disposal		
		Directed to kitchen garden	To the back yard	Road side
1.	Washed water			
2.	Bathing water			
3.	Kitchen water			

d. Bathing facilities in the house:

S.No	Particulars	Tick ( )
1.	Kutcha enclosure near the house	
2.	Pucca bathroom near the house	
3.	Pucca bathroom inside the house	
4.	Community well	
5.	Common bathroom	

E. Latrine details:

a. Do you have the latrine in your house ?

Yes [ ] No [ ]

If Yes, give

b. Details on the latrines

S.No	Types of latrine	Materials used	Cost of construction	Problems

c. Maintenance of latrine:

S.No	Materials used for cleaning	Person incharge for cleaning	Frequency of cleaning	Remarks

d. Is there a water source near to the toilet ?

Yes [ ] No [ ]

F. Sanitation Versus Health

a. Do you face any health problem ?

Yes [ ] No [ ]

If yes, what are the general health problems faced by you?

S.No	Name of disease	Tick ( )
1.	Diarrhoea	
2.	Gastrointestinal disease - Dysentry - Cholera	
3.	Infectious and parasitic disease	
4.	Worm infections	
5.	Jaundice	
6.	Insect - borne diseases - Typhoid - Malaria	
7.	Cold, fever	
8.	Any other	

b. Is there any history of major diseases during last 5 years in your family ?

Yes [ ] No [ ]

If yes, mention:

V. KNOWLEDGE ON ENVIRONMENTAL PROBLEMS

1. Environmental degradation :

a. Meaning of Environmental degradation

b. How environment is degraded ?

2. As a individual what is your role in protecting environment ?

3. Programme on environment:

a. Are you aware of any sanitary programmes of the Government ?

Yes [ ] No [ ]

If yes, what are they ?

b. What do you expect from the government to improve the sanitary condition of your area ?

VI. SUGGESTION TO IMPROVE SANITATION: