4.1. **INTRODUCTION**:

This chapter is devoted to data source. There is no available recorded data on fuel consumption by the households according to income and size of the family in which we are primarily interested. Data which are found from the National-Sample Survey (N.S.S.) are not suitable for classified fuels. These are given in aggregate under the heading fuel and lighting for the whole state. The present work is a case study of Rangia town on demand for domestic fuel consumption. The study requires data on different types of fuel used by the households and their monthly income. As the published data are not available in government offices including Municipality office of Rangia town hence collection of primary data becomes imperative.

In our study we have considered the following types of fuel.

(1) Electricity,
(2) Coke and Coal,
(3) Kerosine,
(4) L.P.G. (Liquidified Petroleum Gas)

(5) Fire wood,

(6) Cow-dung.

However we feel that not all the households are capable of giving exact amount of expenditure involved. This is so when the number of income earners in a family are more than one.

Also woods as fuel, people with reasonable income buy in bulk which lasts for months; only those people specially the lower-middle income group and the poor they buy in small quantity. Their accounts for expenditure for fuel could not be considered so reliable, specially of the upper income group within the lower middle class.

From our survey work, i.e., the households visited, none of them have reported the use of coal or cow-dung as fuel. It may be so that fire wood is easily available and Kerosine is not so scarce a commodity in the urban areas, therefore, people prefer to use other types of fuel other than cow-dung and coal. In urban set-up, people generally do not have more cattle for which the use of dung cake was not found in time of data collection.
4.2. **Sampling Frame** :-

For the collection of Primary data stratified random sampling design has been adopted. For this purpose we have taken each ward as a stratum. In Rangia town there are eight administrative wards. For each of the wards the number of the households with house numbers were made available to us by the **Town Municipality**. We have used this list of households as a primary sampling frame. Due to the financial and time constraints we have decided to take 6 percent of the household units into the sample. The sampling fraction is '60. So the sampling interval between any two chosen sample units i.e., households is 16.

Actually while we were collecting data we had resorted to systematic sampling. According to the procedure of systematic sampling is to select the random number between 1 and 16 and if the first unit happens to be 8 then the successive households to be taken to samples will be 24, 40, etc. etc. Although we have faced a great deal of troubles in collecting data for the consumption of fuel and income, we could cover 120 households.

4.3. **Questionnaire for the Survey** :-

In time of collecting primary data, a comprehensive questionnaire was used in the field. Types of questions that
we have asked the respondents is given in the appendix. The survey was conducted during the summer month of 1984. Any estimate of consumption should therefore be taken to reflect the pattern of fuel consumption during summer only. In summer, consumption of electricity is probably more on account of increasing use of fans, air-conditioners etc. while the consumption of other fuels such as gas, kerosine, coal and fire wood decreases as compared to winter season.

4.4. Secondary data:

4.4.1. National Sample Survey data:

In the collection of Secondary data we have visited the National Sample Survey office at Shillong and requested the officials to help us by supplying published data from their records. In comply with our request they facilitate us in getting necessary data. In the National Sample Survey office, Shillong, we have collected published data of 25th round and 28th round for the years 1970-71 and 1973-74 respectively. Published data on National Sample Survey tables were on consumer expenditure (Rs.0.00) per person for a period of 30 days by broad groups of items and by monthly per capita expenditure classes for the urban areas of Assam. Number of sample blocks was 144 and number of sample households was 338 in 25th round. Number of sample blocks and sample households in 28th round was 143 and 229 respectively.
4.4.2. **Other Sources of data** :-

In regard to other published data we visited the office of the Director of Economics and Statistics, Government of Assam, Guwahati. At our request the office supplied us statistical Abstract, Assam, 1978 and other reference books. Concerning data for research work, we also visited Book Depot Section, Government Press, Assam and collected handbooks and journals namely Statistical Hand Book, Assam, 1982 and Economic Survey, Assam, 1981-82. A few published data regarding consumption of electricity both in domestic sector and commercial sector of Rangia town are taken from the office of the Sub-Divisional Officer, Electricity, Rangia of Assam State Electricity Board (ASEB). We also visited the Noonmati Oil Refinery, Guwahati and collected published data regarding Oil and Gas.

Some other published data are collected from books, magazines, journals, papers etc. in the Libraries of North-Eastern Hill University, Shillong and Gauhati University, Guwahati.

4.5. **Data Arrangement** :

4.5.1. **Survey Data** :

From our survey we have tabulated primary data of the households according to the number of families and their
monthly income distribution, number of families and their distribution of expenditure. Per capita income and the number of household units taking 50 as class interval with Rs. 50.00 as minimum income and Rs. 500.00 as maximum value. Per capita expenditure and the number of household units taking 25 as class interval and Rs. 50.00 and Rs. 400.00 as minimum and maximum value respectively. Monthly total income and the size of the family taking Rs. 400.00 as minimum value with class interval 200 in each class, electricity consumption and size of the family, monthly Kerosine consumption and size of the family, monthly Gas consumption and size of the family, monthly Firewood consumption and size of the family, monthly combined fuel consumption and the size of the family.

In our survey there are 120 observations. Therefore, certain groupings are necessary in order to have a manageable set of data for the purpose of analysis. We have used the following methods to modify the data according to the following manner.

It is permissible to rearrange only the exogeneous variables and not the endogeneous variables. Therefore we rearranged monthly income in this manner.

First we took at the minimum income and the maximum income so that minimum is succeeded by the maximum. Suppose we have in our 120 observations there are 6 families with
the minimum income of Rs. 400.00. For the purpose of analysis we took Rs. 400.00 as minimum income as such. But so far endogeneous variables i.e., fuel expenditure is concerned we have different values for different families as given by the master table. In order to get a single figure for this endogeneous variables we added all the fuel expenditures of the 6 families and took the average of it as the representation of fuel expenditure relating to a family with minimum income of Rs. 400.00. This procedure is followed also for other incomes. A summery table containing different income and different types of fuel consumption with total and average consumption of different types of fuel in different income groups is given in the appendix.

4.5.2. National Sample Survey data :-

We have also tabulated National Sample Survey (N.S.S.) data of 25th and 28th round for urban areas of Assam. In the N.S.S. tables data are given on consumer expenditure (Rs.0.00) per person for a period of 30 days by broad groups of items and by monthly per capita expenditure classes in urban areas. In both rounds total numbers of item are 21. Data are given under monthly per capita expenditure class starting from Rs. 8.00 to Rs. 75.00 at the minimum and maximum value in 25th round table. As
the expenditure of different items under class intervals from 0-8 to 18-21 are found almost blank so we have taken data from the class interval Rs. 18-21 to Rs. 75 and above for the purpose of analysis. In the list of 28th round monthly per capita expenditure classes are given from Rs. 0-13 to Rs. 200 and above at the minimum and maximum. In this list also per capita expenditure for all items in class intervals from 0-13 to 21-24 are found almost blank. Hence data are taken from class intervals Rs. 24-28 to Rs. 200 and above for the purpose of analysis.

In order to do the empirical analysis separately, we have categorised all the items into five sub-groups. Items fallen in each sub-group are given below:

(1) **Essential Items** :-

(a) Cereals  
(b) Grams  
(c) Cereel substitutes  
(d) Edible oil  
(e) Vegetables  
(f) Salt  
(g) Pulse

(II) **Near Essential** :-

(a) Milk and Products  
(b) Meat, Fish & Eggs
(c) Fruits and Nuts
(d) Sugar.

(III) Others :-
(a) Species
(b) Beverages
(c) Pan and Tabacco

(IV) Durable & Other Items :-
(a) Clothing
(b) Foot wear
(c) Rents
(d) Taxes
(e) Durable Goods

(V) Fuel :-
(a) Fuel and Light.

The tables for each group of items are given in the appendix. Tabulated data of National Sample Survey of 25th and 28th round according to per capita fuel expenditure and total expenditure of monthly per capita expenditure class are also given in the appendix.