CHAPTER III

METHODOLOGY

This chapter presents the research design of the study and the procedure as to how the data on time used in household work were collected using different tools and further how the techniques using the different tasks were evaluated for feasibility in order to establish time norms of household work of a large rural population.

Rationale of the Research Design

The findings of a pilot survey with an interview schedule revealed that a single method using a single tool of data collection would not provide adequate data on time used in household work with reference to comprehensiveness and specificity. Comprehensiveness can be achieved in the study by looking into all aspects of household work. Specificity is sought in terms of household work broken up into three components - tasks, subtasks and elements. The three major tools of data collection considered are interview, observation and simulation.

The interview aids in eliciting full details of time-use on all household tasks but the information gathered may stay up at a broad level. That is, it may be

possible to identify tasks upto subtask level, but the time-use estimate would be possible only upto the task level.

Observation of work performance in houses helps identify the tasks upto the specific level of elements and the time estimate would be possible upto the subtask level - a level more specific than is possible by interview method. But observation of tasks performed in a house for two or three days, may not be adequate to gather details on all periodical tasks such as weekly and monthly tasks.

The method of collecting data by simulation aids to provide a very descriptive data of the selected subtasks - component-wise and time-wise. But, it may not be possible to replicate certain tasks like physical care of family members in an exactly similar way. So the method may not give a total picture of household work.

The limitations of each of the data collection tools when used independently for eliciting data on time-use in household work are illustrated in Figure-1 (P.38).

On account of the limitations of these data gathering tools with reference to their comprehensiveness and specificity when administered independently, a combination of the field study tools is attempted. This measure is expected to elicit detailed information on household tasks and the time-used on the same by the families.

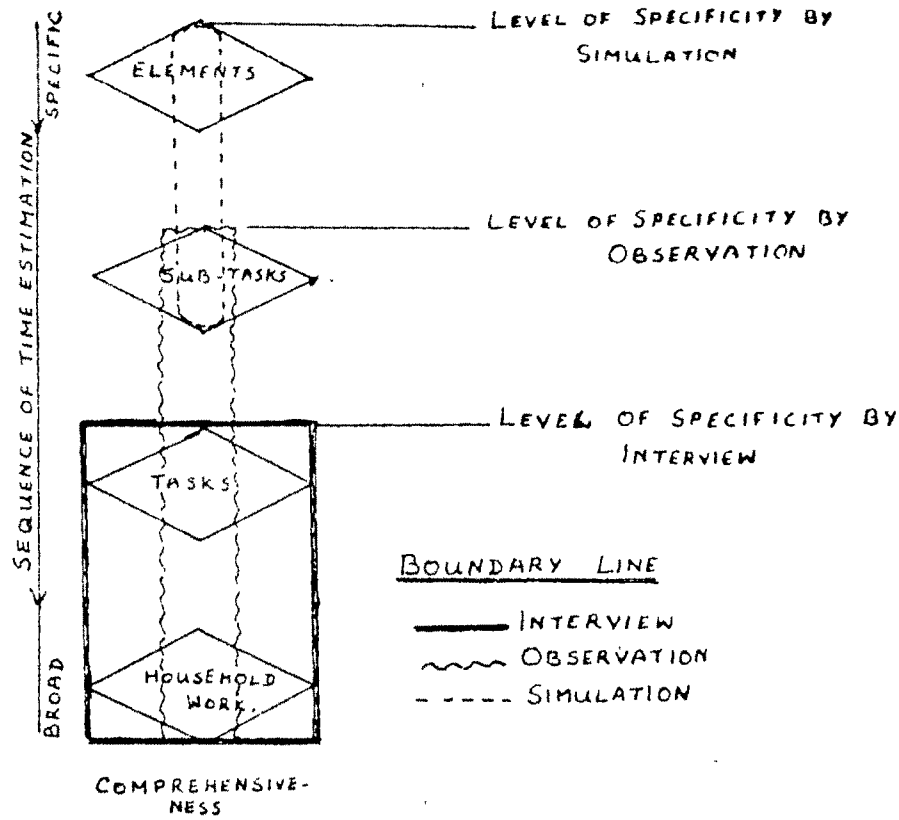

FIG. 1. ILLUSTRATION OF THE LIMITATIONS OF THE THREE TOOLS OF DATA COLLECTION WHEN ADMINISTERED INDEPENDENTLY FOR TIME-USE DATA ON HOUSEHOLD WORK

Research Design

The household work was analysed in terms of its components at different levels of specificity through a pilot study with a view to developing a proforma for collecting data on time-use of families on household work. Further, on the basis of the rationale, techniques using combinations of the tools-interview, observation and or simulation, were designed and administered in the order stated in order to establish the time norms of household work of the defined population. After this, the evaluation of each technique (method) was carried out in the light of the following criteria : 1) validity and reliability of the data, 2) feasibility of the techniques of establishing time norms and 3) adequacy of the data with reference to comprehensiveness and the desired level of specificity. The differences of the techniques from the point of view of variability of time-use in the different units of household work were examined with statistical as well as logical analysis.

A hypothetical model of the procedure to try out the combination of methods (techniques) presented in figure-2 (P. 40) illustrates the research design.

The Hypothetical Model

Method I* based mainly on the interview relying on

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*Referred to also as interview method/technique.

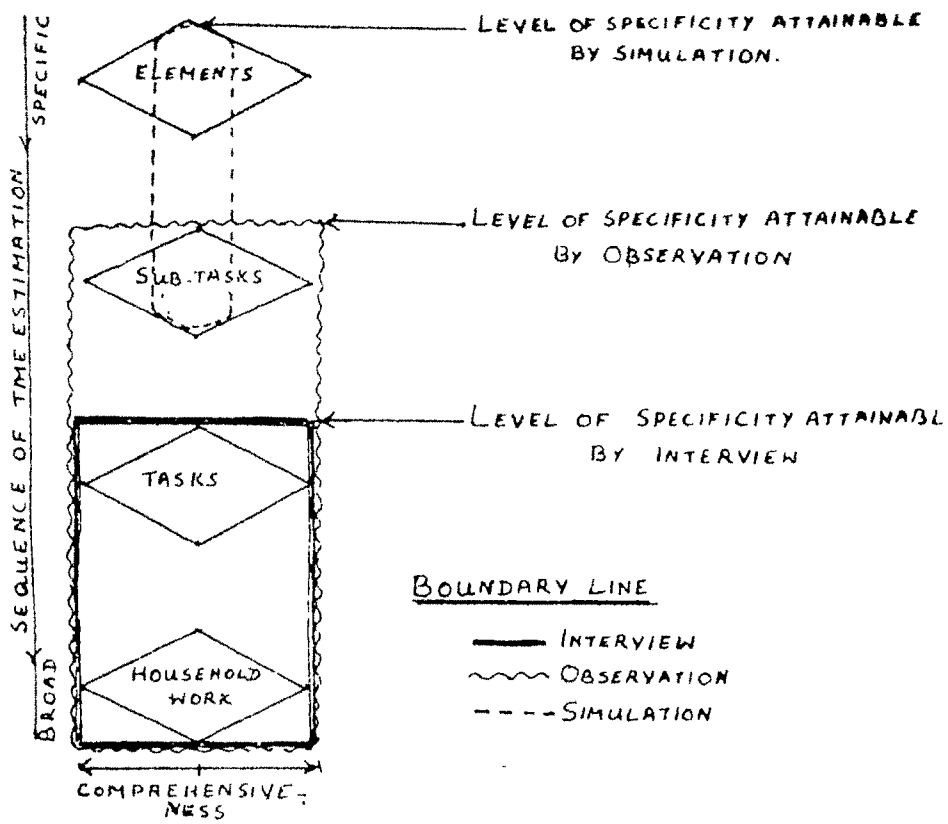

FIG. 2 HYPOTHETICAL MODEL: DEPICTING THE SCOPE WITH REFERENCE TO COMPREHENSIVENESS AND SPECIFICITY OF THE THREE METHODS (TECHNIQUES) CHOSEN FOR ESTABLISHING TIME NORMS OF HOUSEHOLD WORK

recall data on household work was expected to provide a complete picture of the tasks upto subtask level. Further, time-use data were elicited on the work done upto the level of tasks. Certain situational factors, however needed to be observed. Moreover, on account of a large coverage of population, the interview method was used for providing base-line data for designing and administration of tools of the other techniques. This is indicated in the model by the width of the boundary line exceeding the symbol used for measurement of time showing that it is inclusive of the total time spent on all household tasks. This ensures comprehensiveness of the data.

Observation supported with recall (method II*) provided a more detailed data on the tasks and their components. Also, it was possible to estimate the time-use on tasks upto the subtask level. This is shown by the height of the boundary line indicated by wavy lines exceeding that of method I.

The task performance in a simulated environment (method III**) also relies for some data on the first method. This method was assumed to give a comprehensive picture of some of the subtasks. As all tasks cannot be simulated in the way they were performed in all the houses, the data may not be adequate to establish time norms of

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*Referred to also as observation technique/method.
**Referred to also as simulation technique/method.

household work, eventhough on certain tasks a very clear picture can be elicited on their performance and time-use. This is indicated by the narrow boundary lines shown in dotted lines cutting through the symbols of time measurement and task identification. Also the height at which the boundary line (dotted lines) starts in relation to those of the other methods illustrates the lack of depth of data on time-use.

Definition of Terms

The terms and definitions used in the study are:

Household work: is defined as the activity performed in a house to provide the goods and services needed for the family, in order that they may function as a family; therefore, it excludes all tasks performed to provide money income. In the same token, activities like farm work, leisure time work, family occupation, animal care and personal care were specifically excluded.

The term household work is used interchangeably with household chores, household job, homemaking job and household activity.

A task : is the subunit of an activity that can be identified separately from one another. For e.g. food preparation, dish washing, marketing and the like.

Sub-task : refers to a meaningful segment of a task

defined. For example preparation of a meal, feeding a child, carrying food to the farm and the like.

Elements : are the components of a sub-task like pounding, grinding, chopping vegetables and the like.

Time Norm : refers to the actual average time spent in work by a defined population.

Family : refers to the smallest residential unit in the locality comprising two or more persons living together catering to and caring for each one's needs. The term is used interchangeably with household.

Homemaker : is individual (male or female) with primary responsibility for operation of the household.

Technique or method of establishing norms : refers to the procedure to use a combination of tools of data collection on time-use for household work.

Time signal : Visual or audible events occurring regularly at specific clock hours like the church bell, the school bell, the milk man's bell, crossing of buses plying on fixed schedules, hours of electricity supply and water supply, and the like in the chosen region, which could be referred by the subjects as cues.

Population

The population chosen for the field study comprised all the 1203 households in the eleven selected villages in

two adjacent Panchayat Unions. For easy accessibility, eleven villages were chosen specifically out of the 25 villages in the service area of Gandhigram Rural Institute.

The number of households covered by this enquiry is given villagewise in Appendix I. All the three techniques were purposively experimented with the same sample population for comparability from the methodological point of view.

Interview (Technique I)

This method was used (a) as a technique for establishing time norms of household work and (2) to provide base-line data for applying the simulation technique.

Type of Data Required

The data required for the study consisted of: (a) the background characteristics of the sample that is to say (i) the background characteristics of the families, (ii) characteristics of the homemaker and (iii) physical amenities available to families.

b) Job content of household work which means the list of household tasks performed by the families, the frequency of performance of each task, the components of

each task and the situational variables associated with each.

c) duration (Temporal measure) of household work in terms of time spent in various household tasks, associated with the dependable time signals* available in the area and the work participation by family members in household work performance.

Data Collection Procedure :

Of the several data collection techniques like interview, questionnaire administration and observation, the interview was chosen as the first method because of the complexity of problems in eliciting reliable and valid data on time used in household work from the illiterate respondents. Added to these are the advantages listed by Gordan (1969) that :

1. it enables the investigator to obtain desired information more quickly.
2. it permits the investigator to be sure that respondents interpret questions properly.
3. it allows greater flexibility in the process of questioning.
4. much more control can be exercised over the content within which questions are asked and answers given.

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* Refer Appendix II.

5. information can be more readily checked for its validity on the basis of nonverbal cues by respondent.

Moreover, it is one of the most commonly used method of gathering data on time-use in household work from a large population.

Selection of the Sample

The sample frame consisted of a comprehensive list of the households within the administrative limits of the selected villages. The household list maintained at the Centre for Research, Extension and Integrated Rural Development of the Gandhigram Rural Institute was used for the purpose. The households were listed serially. The sample size was fixed at 120. The households were chosen from the population using two random starts, each decided by fishbowl draws from numbers one to twenty.

Selection and Preparation of the Instruments

Pilot Study and Pretesting: As the literature in the chosen area was inadequate to formulate items in the interview schedule, a pilot study of five selected households from a village similar in social setting and economic structure in the same taluk was launched as a preliminary step to identify areas and topics on which to formulate the relevant questions. With the help

of an interview guide the major areas of inquiry such as the background characteristics, household work and its components, frequency of performance of the tasks and the duration spent in each task by each member of the family were located.

These areas were further analysed for inclusion in the final schedule to gather detailed information. This preliminary exercise uncovered the difficulties in gathering valid time-use data from rural homemakers who seldom have a clear concept of an hour, and its subunits. Further, the difficulties faced in recording descriptive data on each person's work schedule were also revealed. Also, the need to involve other members available in the family in the informal discussions and the like was highlighted.

Another important clue thrown up at this stage was in respect of need for identifying the time signals available in each village and relating time-use enquiry to the same. The signals were verified by a random check of time cues for two days in each village. Thereafter relevant questions on the selected areas were formulated and arranged in the sequence shown up by the results of the pilot study. The pilot study thus helped in determining arbitrarily the starting and finishing points of household work as well as its component tasks so as to identify

the cut off points of each task.

This instrument was then pretested on a different sample in the same area to help improve upon its structure, the nature and type of questions and order of the items for greater reliability and validity. The pretesting also aided in modifying the descriptive definitions of the tasks (Appendix III) and in confirming its adequacy for gathering data without confusion.

Pretesting enabled the investigator to sense the problems associated with data collection work due to the very complex and fragmented nature of the household work and its pattern of performance. These problems were the non-availability of the respondents, the housewives at home during the day time and her busy work schedule from morning till night fall. The means for cutting short the length of the interview time and creating interest in the respondents to provide the required data could also be worked out. As a result, it was decided to supplement the data gathered by non-directive interviews of informal nature with each of the respondent on the daily routine of household chores in her family. Such interviews were lengthy and difficult to record; and so a tape-recorder was used for this purpose. The contents of such interviews were analysed on the basis of the following categories:

1. identification of household
2. size of family and composition
3. itemised household work of each member and the time spent on each task by each person.
4. hindrance or causes of delays, if any, in performing household tasks and
5. facilities present or lacking at home and in the village that influence their household work.

The pretesting results were examined for adequacy of the data laying out of the frame of analysis together with the relevant statistical test. Based on the insights gained from the pilot study and pretesting the schedule was finalised (Appendix IV).

Collection of Data

The respondents were the homemakers. They were interviewed mostly after night meals around 7 p.m. and 9.p.m. They were found to be relaxed during these hours. This was so, because most of them were not available at home during day time and were found to be busily engaged either in household or other work from dawn to dusk.

Prior to data collection, the consent of the head man, the 'Talaiwar' or the leader of each hamlet was obtained for conducting the study within the area, after explaining to him the purpose and scope of the study.

Thereafter, the investigator, visited the chosen families and tried to establish rapport with them to obtain their consent and cooperation in eliciting required data on household work. This in a way, helped to enhance the reliability by keeping the latch strings out for recall and recheck on the data elicited.

The spatial dimensions of each of the houses were measured and the total floor area of each house was calculated. Other amenities like kitchen arrangement and facilities for cooking and storage were also observed and studied during the house visits.

A formal interview took approximately 30 to 35 minutes. Recording of conversations on tape, a technique unfamiliar to the villagers created interest in the respondents and induced them to come forward and answer any number of questions asked. Each recording took 20 to 25 minutes per respondent.

The data collected with the two techniques- the formal and informal interviews were checked for consistency and were integrated to obtain the required data for further analysis.

Reliability

The data recorded on tape helped the investigator to obtain consistency of the responses given by the

respondents on the basis of the two techniques employed for the purpose.

Reliability coefficient was calculated by finding the product moment correlation between two recordings of data- one by the tape recorder and the other by direct investigation on one of the items of household work: time spent per day for care of house. The estimated value- r = 0.46 indicated a trend for moderate level of consistency in time reporting.

The measures taken to improve validity and reliability of the time-use data elicited from the respondents included:

1. a very clear definition of the task and its components with cut off points arbitrarily fixed prior to data collection.
2. house-visits on the day previous to data collection to request the respondents to note (mental picture) their use of time and pattern of time-use on each of the household tasks for giving that information the next day. The same evening the data were collected. The housewives were informed of the dependable time signals in the area and were asked to measure time with reference to these time signals.

Further, clarifications on time measurement when tasks were dovetailed or performed by two or

more persons simultaneously enabled to give clarity to the respondent on time-use estimate on household work. All doubts and confusions were cleared on the day previous to data recording.

3. a very close rapport built up with the families to be interviewed.

4. use of formal and informal devices for gathering data.

Plan of Analysis

After completion of data collection, the major variables were categorised as follows :

1. Social status of the households -
   a) by religion - Hindus and Christians.
   b) by caste - dominating castes, service castes and scheduled castes.*

2. Type of family - nuclear and extended.

3. Size of family - small and large.

4. Number of children - by age and total number.

5. Occupation of the household - agriculture (own land cultivation), daily labour, caste-bound work and non-farm work.

6. Income of the house - very low, low, middle and high.

7. Age of the homemaker - less than 30 years, 31 - 50 years and 51 and above.

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*Referred to also as Harijans

8. Educational level of the homemaker - illiterate, upto 5th standard, 6th standard to S.S.L.C. and higher.
9. Employment status of the homemaker - employed and not employed.
10. Type of house - hut, kutcha, pucca.
11. Type of kitchen - Types -I, II, III and IV.
12. Meals - Types -I,II,III and V.
13. Whole day's meal preparation - very simple, simple, elaborate.
14. Time taken for household work - by actual hours spent.
15. Frequency of performance of household tasks - daily, weekly, monthly and less frequently. The description of the categories used is given in Appendix V.

Statistical Treatment of the Data

Frequencies and percentages were used for simple classification of data and comparisons. The measures of central tendency - mean, mode and median were estimated for the time spent on household work and the tasks, to examine the validity of the time norms established from the mean figures. The statistical measures used to study the significance of association between the independent

variables and dependent variables were Chisquare test, analysis of variance, the t-test and Pearson's product moment correlation coefficient. For all types of tasks, the level of significance required for judging the association positively was .05 level of probability. The assumptions made in using parametric statistics were normality and homogeneity of variance. Attempts had been made in the survey to achieve randomness and thereby dependability of the measures pointed out for the population under study.

Observation (Technique II)

An intensive observation of two days' household work performance in selected households with supportive data gathered through interviewing the homemakers was the next technique used for establishing time norms of household work.

Type of Data Needed

The data required were on (1) the job content of household work, (2) time spent in a week on household tasks and sub-tasks, (3) the pattern of performance of all tasks - whether done daily or weekly and by one person or jointly by two or more persons at a time, and (4) the specific factors influencing the time-use on each task.

Selection of the Sample

A sub sample of 39 households, approximately one third of the initial survey sample was chosen by stratified random sampling for this intensive study of household chores. Stratification of the population was done on the basis of their caste and income.

The representativeness of this sub-sample with the primary sample of 120 households was statistically tested with chi-square values estimated for the distribution of households of sample I and the sub-sample by their reported hours of total household work (interview data). The Chi-square value (10.683 < .05 level, d.f.=4)* was not significant. It could therefore be confirmed that the sub-sample was a representative sample of the first sample.

Tool Used:

The members of the families were contacted personally to seek their co-operation and consent for observing their household work from 5.30 a.m. to 8.30 p.m. for two full days. A non-participant type of observation was planned.

A proforma was prepared for recording the details of household work and other required data like meal pattern, procedure followed for preparing each item

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*Refer Appendix V

of the menu, the utensils used, number and type of utensils cleaned, cleansing agents used and similar other details.

A time record sheet was used to record the household activity time and timings against specific tasks and sub-tasks specifying the member of the household performing the same. The time record sheet was a chart with 12 columns, each indicating an hour. Each column was divided into six equal units, each unit representing 10 minutes. The columns were divided horizontally into divisions, each division assigned to a task. Further, each division was sub-divided horizontally to accommodate the members participating in the task. The first sub-division in each row was assigned to record the time-use of the homemaker and the second and the following sub-divisions for specified members of the household. Space was provided at the left hand side of the chart to write specifically the task against its time recording.

Time spent on each task or sub-task was recorded by just filling in the columns against the task mentioned in the division assigned to the specific member of the household below the specific hour of the day indicated at the top of the column. If a single task was performed by two persons at a time, the rows (sub-divisions only) provided for both were filled in against the specified

tasks, indicating the exact duration and timings. Supposing an individual dovetailed a task with another like meal preparation and household cleaning, two rows against the different tasks were filled in, in the division specified for the worker. Horizontally the record thus indicated the duration spent by each worker on each household task.

The proforma along with the time record sheet was modified with close-ended questions after pre-testing with four families of a hamlet near the study area. Attempts were made to reduce descriptive writing to a minimum.

A task summary sheet was used as a work sheet for computing time-use on each task. A copy of the instrument is appended (Appendix VII).

Collection of Data

As weekly tasks could not be observed in all households during the two days' observation period, a recall of the same was necessary. Whenever possible, the weekly tasks were also observed and recorded on the time chart.

In order to account for variability of task performance in a week, two consecutive days of a week and the same days of two weeks were specifically avoided.

The respondents were informed the previous night itself about the intention of the investigator to observe their task performance pattern on the following day.

Reliability of the observation was improved through proper observation and recording of the work habits of the households, the correct usage of the time recording instrument and by including the households that unhestitatingly co-operated.

A check was done on the recorded timings of a simple task, as for example, cleaning of the yard; and the figures noted for the two days were correlated for verifying reliability of the observations. The correlation coefficient (r) was 0.9358. This indicated a high degree of reliability in the observations.

The procedure followed for performing each task was recorded in detail in order to sketch its normal mode of performance. This discriptive recording was helpful to pick up the components of each task and compute the time taken for the same without any confusion.

Analysis of the Data

The same procedure, as followed in the case of the survey method, was used to establish the norms of household activity and its components. The statistical

measure used in the treatment of the data were also the same.

Simulation (Technique III)

Measurement of tasks when performed in a laboratory is easier and quicker to observe and record in detail. The measurement of time used for a task will also be valid and reliable if the work is performed in an exactly similar environment and by similar workers. Hence an attempt was made to study simulation as a technique for establishing time norms for the selected components of food preparation task.

Data Collection Procedure

The typical meals of the population were identified by the analysis of the items of food prepared during the survey period by the households in the base line survey. The typical meals were operationally defined as those meals reported by more than 5 per cent of the households. Accordingly, four types of meals were identified thus:

Type I - Plain rice / Bajra 'Kali'*/Jowar'Kali'

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* A term in Tamil. All terms in Tamil (local language) used in this report are shown within single inverted comas. The glossary of such terms is given in Appendix VIII.

Type II - Type I meal + a side dish (dhal gravy/'sambar'/'Rasam'/'Thuvayal'/ Tamarind gravy).

TypeIII - Rice + 2 side dishes. ('Sambar' and 'Kootu'/ 'Sambar' and 'Poriyal'/ Tamarind gravy and 'Kootu').

Type IV - Iddli and 'Sambar' or Chutney/ Dosai with Sambar or Chutney.

To simulate the work environment, the fuel, utensils and equipment used for cooking and allied work, the types of kitchen and the number of workers performing the task were reviewed from the interview data. The quantity and quality of food stuffs used were also looked into to know the working condition of the majority of the households and the expected standards of the product.

All families used only firewood and so it was chosen as the fuel. In 86 percent of the households, food preparation was done by the homemaker herself. Only in the remaining 17 households, a partial help had been rendered by other members of the family. The majority being thus dependent on a one-worker pattern, it was decided to have only one worker while simulating the work.

The cooking utensils used by the respondents were of aluminium and earthernware (Table I).

TABLE 1

Base Materials Used for the Cooking Utensils Based on Survey Findings

Preparation	Base material of the cooking utensils.	Households(N=120) Frequency	Percentage
Main dish	Mud pot	49	40.8
	Aluminium	71	59.2
Side dish.	Mud pot	80	66.7
	Aluminium	40	33.3

Based on these data, it was decided to use aluminium utensils for preparing the cereal preparations- 'Kali', boiled rice and iddli and the earthernware pot for preparing the side dishes.

The average quantity of foodstuffs used by a household was computed from the amounts used by the 120 households. It was found that, on an average, a family used one kilogram of cereal and a quarter kilogram of the locally available vegetable for cooking a meal of one cereal preparation and one side dish. For the second side dish also a quarter kilogram vegetable was typical and so decided to use the same amount . The other ingredients were decided on the basis of the procedure

followed by the housewives participated in the experiment.

Four workers were chosen by purposive sampling procedure. The kitchen and work areas were set in a hired house in the study area. The necessary utensils were listed and collected for setting up the kitchen(Appendix IX). Equipment were also located in convenient places as is done in a typical house.

Necessary quantity of cereals, pulses, and other grocery items were purchased in bulk to avoid variations due to the differences in the kind and quality of raw materials. Vegetables and other perishable goods were purchased daily from the market and / or the local fields.

With each type of meal, it was planned to have four observations. In the case of type I and II meals, as the cereals used were different, four observations were made for the meal with each type of cereal. Hence the experiments planned were as follows :

Type I Meal

Jowar 'Kali'	- 4 observations
Bajra 'Kali'	- 4 observations
Plain rice	- 4 observations

Type II Meal

Jowar 'Kali' with a side dish	- 4 observations

Bajra 'Kali' with side dish - 4 observations
Rice with side dish. - 4 observations

Type III Meal

Rice with 2 side dishes - 4 observations

Type IV Meal

Iddli with Sambar/Chutney - 4 observations
Dosai with Sambar/Chutney - 4 observations

Each worker was instructed to prepare the meals with the materials supplied to her. Altogether 36 experiments were conducted.

The work was not controlled. Only the cooking environment was controlled. Each worker was asked to follow the procedure she used at home for preparing the meals. She was asked to prepare the items and then empty the same to another utensil and clean the utensils used and the work area before leaving the place. Time taken for each specific elementary task was recorded with the help of a stop watch in minutes and seconds. The seconds were converted to tenths of a minute following the table used for conversion of minutes into hours while recording the survey data (Appendix V).

Two observers recorded the timings of each task on the record sheets provided for the same. This helped to improve the reliability of the recorded timings of each task. The variation in the recorded timings was only marginal and between 5 and 10 seconds. Hence the average time was taken for the computation of the norms.

Data Analysis

The average time taken for each type of meal was computed in hours. Time cost of subtasks and elements was estimated for each worker. The workerwise and mealwise analysis of time used for preparing each type of meal could help identify the reasons for variations in time-use of similar families on food preparation.

Evaluation of the Techniques

The time norms established for household work and its components were compared and examined for any possible significant differences in values estimated by each technique. The difference in means of Technique I and II was statistically assessed with the t-test. Prior to administration of a parametric test like the t-test, it is necessary to confirm whether the data satisfied the two conditions (1) representativeness of the population characteristics in the samples and(2) the homogeneity of variance of the variables under study within the population. The first requirement had already been confirmed at the time of selection of sample II with Chi-square test. The second requirement was tested with F-test which is defined as :

$F = \frac{s_1^2}{s_2^2}$ where s_1^2 = the larger of the two sample variances.

and S_2^2 = the smaller of the two sample variances.

(Downie and Heath, 1974, p.174).

The estimated F-values were not significantly different for time used in all tasks other than firewood collection. So the variance of the variables compared was homogenous in either samples except in the case of time-use in firewood collection. The estimated F-values are given in Appendix X.

The techniques were further scrutinised for the possibilities of errors in sampling, data collection and administration in order to judge the dependability of each technique.

The limitations of each technique were critically reviewed based on the experience gained in the earlier part of the research. The time demanded for collecting data by each technique was examined to assess the feasibility criterion for administering each of the methods to a larger population.

A final assessment of the methods was made in terms of the hypothetical model to examine the adequacy of the techniques in terms of their specificity and comprehensiveness in providing the data for establishing time norms of household work.

Based on the evaluation results, guidelines for a systematic approach to establish time norms of household work of rural families were derived.