

OPERATIONAL ISSUES IN CONDUCTING THE PILOT TIME USE SURVEY IN INDIA

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INTRODUCTION

With a view to estimate properly the contribution of women to the national economy and to study the gender discrimination in household activities, a pilot Time Use Survey was conducted in 18620 households spread over six selected States, namely Haryana, Madhya Pradesh, Gujarat, Orissa, Tamil Nadu and Meghalaya during the period June, 1998 to July, 1999. As this survey was first of its kind in India and even among the developing countries, a number of operational issues were to be resolved before launching the survey. In this paper an attempt has been made to describe some of the important operational issues such as sampling methodology, estimation procedure, method of data collection, development of questionnaire, data processing, etc. Mentions have been also made about the monitoring mechanisms evolved to ensure the completion of various activities involved in the survey in a time bound manner.

II. DETAILS OF SAMPLE SELECTION FOR THE TIME USE SURVEY

As no previous survey was conducted on this topic and concepts and methodologies to be used were not firmed up, it was decided to conduct this survey on a pilot basis. However, to ensure the use of data collected in the pilot survey also, a proper sampling procedure was followed.

(a) Selection of States:

India has lot of socio-economic, demographic, geographic and cultural diversities. To ensure that all aspects of diversities are captured, six States were selected to give geographical presentation to each regions of the country. Haryana, Madhya Pradesh, Gujarat, Orissa, Tamil Nadu and Meghalaya were chosen to represent northern, central, western, eastern, southern and north-eastern regions respectively.

(b) Distribution of Sample in the Selected States:

The total sample size of 18628 households was first distributed among the States in proportion to the total number of estimated households as per the 1993-94 survey of the National Sample Survey Organisation. The further distribution of the allocated sample in the States in the districts, villages and towns were as per the following procedures,

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(C) SELECTION OF DISTRICTS

ALL the districts in a state were grouped in four strata using the criteria of density and proportion of schedule tribe population as follows:

Stratum 1. Districts with population density less than median density and proportion of schedule tribe population less than median schedule tribe population	Stratum 2. Districts with population density less than median density and proportion of schedule tribe population more than median schedule tribe population
Stratum 3. Districts with population density more than median density and proportion of schedule tribe population less than median schedule tribe population	Stratum 4. Districts with population density more than median density and proportion of schedule tribe population more than median schedule tribe population

No. of First Stage Units (Villages and Sample Blocks) were determined using the initial sample size to be allocated to each state and by assuming that in each F.S.U. , 12 households will be surveyed . The number of F.S.U. so arrived at was adjusted to be multiple of 8 as atleast 2 F.S.U. each may be covered in 4 sub-rounds.

The No. of districts to be selected (fixed earlier) in each state were distributed in 4 strata in proportion to the total population in each stratum. If more than one district was to be selected from a stratum then all the districts were arranged in the decreasing order for population density and proportion of tribal population. Selection of both the districts was done using circular systematic sampling with equal probability.

For getting the district – wise allocation of the f.s.u., the total f.s.u. sample was distributed among the selected districts in proportion to the population of the districts.

The rural (villages) and urban (sample blocks) sample in a particular district was worked out by distributing the total number of f.s.u. in rural and urban sample in proportion to the rural and urban population in the district.

(d) Selection of Villages

All the villages in the selected district were grouped in 3 categories namely large (population above 1200) , medium (population between 400 to 1200) and small(population less than 400) . The total rural sample was distributed in three stratum in proportion to the population in the three stratum . In case any stratum was not applicable in a particular district , the allocated sample was distributed in the remaining stratum only . If more than one village was to be selected in the particular stratum , then villages were selected using circular systematic sampling with probability proportional to

the population. If all the three strata were present then minimum sample size allotted in each stratum was 2.

(e) Selection of Urban Sample Blocks

All the towns in the selected district were grouped in 3 categories namely large(population more than 2 lakhs), medium(population between 50000 to 2 lakhs) and small(population less than 50000) . The total urban sample was distributed in three stratum in proportion to the population in the three stratum. In case any stratum was not applicable in a particular district, the allocated sample was distributed in the remaining stratum only .If more than one sample block was to be selected in the particular stratum , then UFS blocks in each of the towns were presented by Investigator Unit and UFS Blocks No. The requisite number of UFS Blocks were then selected by using circular systematic sampling with equal probability. If all the three strata were present then minimum sample size allocated in each stratum was 2.Due to this , in some cases, overall urban sample size allotted in a particular district might have increased.

(f) Distribution of Villages/Urban Blocks in Sub-Sample and Sub-rounds

The allocated sample in a particular stratum of rural or urban area of a particular district was first distributed in two interpenetrating sample of equal size i.e. both the sample were drawn independently using circular systematic sampling . The sample size for a particular sub-sample was then evenly distributed in 4 sub-rounds. If there were only 2 sample units then they were covered in two sub rounds only. But the selected sub-rounds were not contagious to take care of the seasonality effects. In case of odd number of sample size, sub-round wise allocation was adjusted by increasing the sample size in one sub-round and decreasing in another.

The details of the sampling procedures are summarised in the following table.

STATE	NO. OF DISTTS	TOTAL SAMPLE INITIALLY ALLOTTED	NO. OF DISTTS. IN THE SAMPLE	NO. OF FIRST STAGE UNIT			NO. OF SELECTED HOUSE-HOLDS		
				RURAL	URBAN	TOTAL	RURAL	URBAN	TOTAL
MADHYA- PRADESH	45	5027	15	318	106	424	3816	1272	5088
GUJARAT	19	3174	7	140	124	264	1680	1488	3168
MEGHALAYA	7	520	4	34	14	48	408	168	576
TAMILNADU	29	5588	10	304	168	472	3648	2016	5664
HARYANA	17	1320	6	82	30	112	984	360	1344
ORISSA	30	2758	10	188	46	234	2256	552	2808
TOTAL		18628		1066	488	1554	12792	5856	18648

III ESTIMATION PROCEDURE

Notations :

- S : staratum D: total number of districts d : number of sample districts
 i: subscript for i-th sample district r/u : subscripts for rural/urban
 j : subscript for j-th class(j=1,2,3) k : subscript for k-th sample village/blocks
 m : subscript for p-th sample household Z : size of a stratum x sample district x rural/urban x class
 n: number of sample villages/blocks available for tabulation
 z: village/block size (equal to village population as per frame and z = 1 for each urban
 L: total number of hg's/sb's formed in a village/block
 H: total number of households listed
 h: number of households surveyed and available for tabulation
 y: sample value of any characteristic under estimation

\hat{Y} : estimate of the population total of the characteristic y

Formula for Estimation

$$\hat{Y}_{SR} = \frac{D_s}{d_s} \sum \sum \left[\frac{Z_{sirj}}{n_{sirj}} \sum \frac{1}{z_{sirjk}} \left\{ L_{sirjk} \sum \left[\frac{H_{sirjk m}}{h_{sirjkm}} \sum y_{sirjkmp} \right] \right\} \right]$$

The same formula may be used to obtain \hat{Y}_{su}

$$\hat{Y}_s = \hat{Y}_{sr} + \hat{Y}_{su}$$

Estimate of total of y at the state level may be obtained by summing $\hat{Y}_s, \hat{Y}_{sr}, \hat{Y}_{su}$ as the case may be State level estimate of aggregates (Y) may be added to obtain estimate of the total of y for all states combined.

The above formulae may be applied to obtain sub-sample wise estimates first where n will denote number of sample villages / blocks available for tabulation in the concerned sub-sample .Pooled estimate based on both the sub-samples may be obtained as the simple average of the two sub-sample estimates.Ratios of the form R=Y/X may be estimate at the last stage at any desired level by taking the ratio of estimate of Y to the estimate of X.

IV: QUESTIONNAIRE

The final questionnaire used in the survey was evolved after a number of discussion with the academic experts and the practising survey statisticians. The final questionnaire consists of following three parts:

- i. Schedule 0.1: Listing Questionnaire for the Rural Areas
- ii. Schedule 0.2: Listing Questionnaire for the Urban Areas
- iii. Schedule 0.3: Household Questionnaire which consist of following Blocks
 - (a) Block 0: Identification of Sample Households
 - (b) Block 1: Household Characteristics
 - (c) Block 2: Particulars of Household Members
 - (d) Block 3: Time Disposition of Persons on Selected Days of the Week

A copy of the questionnaire is at Annex –I.

V. SELECTION OF THE FIELD AGENCIES

The pros and cons of getting the survey conducted through a Non-Governmental Organisation (NGO) was deliberated in great details. As the survey was to be conducted in 6 States, the strength of the NGO in terms of skilled manpower was an important consideration. As it was difficult to identify such a NGO, it was decided to involve, Directorate of Economics and Statistics of the respective States in this exercise. These organisations already conduct large scale surveys and have their offices located at the districts and block level. Moreover, they also have the data processing facilities. The use of these organisations helped in fast training of the already experienced investigators, reduction in the cost of the survey due to short distance travel involved by the investigators, avoidance of the involvement of another agency for the data entry and processing work. The involvement of these agencies also helped in the capacity building in these organisations.

VI: TRAINING OF THE SURVEY AND DATA POCESSING PERSONNEL

Soon after the development of the questionnaire, data entry format was also developed. Then a Training for Trainer Programme for all the concerned official of the six States was organised by the Central Statistical Organisation (CSO). Sampling design, field scrutiny, data entry formats and each question of the questionnaire was explained in great details during 5 days training. Hands on training was also imparted to the participants to familiarise them with the data entry package. Field training was also organised in one rural and one urban areas to canvass the questionnaire and understand the difficulties likely to be encountered by the investigators.

Detailed instruction manual was also prepared for filling in the questionnaire by the investigators and was discussed and explained in the training programme.

VI. METHOD OF DATA COLLECTION

The merits and demerits of three methods of data collection on time use pattern, namely, diary methods, observation method and interviewer method. Keeping in view the Indian situation, it was finally decided to use the interviewer method for collection of data. To ensure that women's responses were correct, the composition of the investigators team was one male and one female. Wherever, the female investigators were not available, the assistance of the local ANM or Anganwadi worker was taken.

To familiarise the investigators with the survey area to be covered by them, they were asked to stay in the village/urban blocks for 9 days. First two days were to be used for houselisting and selection of sample households. Then one day was to be used for collection of information on the type of days patterns for the individuals of the selected households. To minimize the recall lapse in enumerating the activity pattern, maximum of 24 hour recall lapse was taken.

To catch the variation in the activity pattern, time use data was collected for all the individuals aged 6 years and above for three type of days, namely normal, abnormal and weekly variant. After selecting the household, the investigator visited the selected households to find out the details of three types of date from different members of the selected households. Based on the information the investigator prepared the work programme for the next one week. If the normal date for an individual was Monday, the investigator will visit that member on Tuesday to find out his time used pattern on Monday. This arrangement worked quite well for normal days but there was some problem, particularly in the urban areas for weekly variant because in urban areas, Saturday and Sunday were generally reported as weekly variant and the investigator has to cover all the selected households on Sunday and Monday.

VII ACTIVITY CLASSIFICATION

To capture the individual response on the time use pattern, a detailed activity classification was prepared. Basic consideration while preparing the activity classification was that all the activities may be categorised into activity pertaining to System of National Accounts (SNA), Conditional SNA and Non-SNA. As there was no previous classification available in the country, a new classification was developed using such classification available from other international organisations and some other countries. In the classification, all the activities were grouped into following categories :

- I Primary production activities
- II Secondary activities
- III Trade, business and services
- IV Household maintenance, management and shopping for own households
- V Care for children, the sick, elderly and disabled for own households
- VI Community services and help to other households
- VII Learning
- VIII Social and cultural activities, mass media etc.
- IX Personal care and self maintenance

A copy of the activity classification used in the Survey is at Annex II.

VIII MONITORING MECHANISM

To provide technical guidance for various activities in the Survey, a Technical Advisory Committee (TAC) was constituted under the Chairmanship of Prof. Indira Hirway, a non-official expert from Centre for Development Alternatives, Ahmedabad. A number of meetings of the TAC was held to finalise the questionnaire, sampling design, tabulation plan etc. The members

of the TAC also visited the field to see the quality of field work. The officers of the Central Statistical Organisation involved with this Survey also frequently inspected the field work. For each State participating in the Survey, a Technical Advisory Committee was also constituted which has the representation of non-official members also. These State level Advisory Committees were also requested to meet every quarter to sort out the local problems and provide the guidance. Each State was also asked to submit regular progress report of the field work. Because of these strict monitoring mechanism, field work of the Survey was completed, as per schedule in July, 1999.

IX DATA PROCESSING

The data entry and validation work of the Survey was handled by the States for which data entry and validation packages were supplied by the Central Statistical Organisation. A Workshop was also organised to sort out the various problems faced by the States in the use of these packages. For evolving the data entry and validation package, the help of Data Processing Division of the National Sample Survey Organisation was taken. The validated data was sent by States to the CSO and the final processing of the data was done by the Computer Centre of the Department. In spite of severe problem faced in the operation of main-frame computer at the Computer Centre, data processing work of the Survey was completed by the end of November, 99.

X DEVELOPMENT OF VALUATION METHODOLOGY

As the main objective of conducting the Time Use Survey is to value the unpaid work in the economy, some deliberations were held for evolving the methodology. As wage data would be required to undertake this exercise, it was decided to collect the wage data for skilled and unskilled workers and for those involved in construction and manufacturing activities. These wage data have been collected for each district in which the Survey village/Urban block was located. This was considered essential because there is large scale variation in the wage data among different States and different regions within the State. The actual valuation exercise is likely to take some more time.