# Note on Sample Design and Estimation Procedure of NSS 66th Round

## 1. Introduction

1.1 The National Sample Survey (NSS), set up by the Government of India in 1950 to collect socio-economic data employing scientific sampling methods, started its sixty-sixth round from 1st July 2009. The survey will continue up to 30th June 2010.

## 2. Outline of Survey Programme

2.1 **Subject Coverage:** The 66th round (July 2009-June 2010) of NSS is earmarked for survey on ôHousehold Consumer Expenditureô and ôEmployment and Unemploymentô. The survey on ôhousehold consumer expenditureô and ôemployment and unemploymentô is the eighth quinquennial survey in the series, the last one being conducted in the 61st round (2004-2005) of NSS.

2.2 **Geographical coverage:** The survey covers the whole of the Indian Union *except* (i) interior villages of Nagaland situated beyond five kilometres of the bus route and (ii) villages in Andaman and Nicobar Islands which remain inaccessible throughout the year.

For Leh (Ladakh) and Kargil districts of Jammu & Kashmir there is no separate sample first-stage units (FSUs) for ôcentral sampleô. For these two districts, sample FSUs drawn as ôstate sampleô will also be treated as central sample. The state directorate of economics and statistics (DES) will provide a copy of the filled-in schedules to Data Processing Division of NSSO for processing.

2.3 **Period of survey and work programme:** The period of survey is of one year duration starting on 1st July 2009 and ending on 30th June 2010. The survey period of this round is divided into four sub-rounds of three monthsô duration each as follows:

| | | |
|---|---|---|
| sub-round 1 | : | July - September 2009 |
| sub-round 2 | : | October - December 2009 |
| sub-round 3 | : | January - March 2010 |
| sub-round 4 | : | April - June 2010 |

In each of these four sub-rounds equal number of sample villages/ blocks (FSUs) has been allotted for survey with a view to ensuring uniform spread of sample FSUs over the entire survey period. Attempt will be made to survey each of the FSUs during the sub-round to which it is allotted. *Because of the arduous field conditions, this restriction need not be strictly enforced in Andaman and Nicobar Islands, Lakshadweep and rural areas of Arunachal Pradesh and Nagaland.*

2.4 **Schedules of enquiry:** During this round, the following schedules of enquiry are being canvassed:

| | |
|---|---|
| Schedule 0.0 | : list of households |
| Schedule 1.0 | : consumer expenditure |
| Schedule 10 | : employment and unemployment |

Two types of Schedule 1.0 viz. Schedule Type 1 and Schedule Type 2 are being canvassed in this round. Schedule Type 1 is similar to Schedule 1.0 of NSS 61st round. Schedule Type 2 has different reference period (7 days) for some items of food, pan, tobacco and intoxicants as compared to 30 daysô reference period for these items in Schedule Type 1.

2.5 **Participation of States:** In this round all the States and Union Territories except Andaman & Nicobar Islands, Chandigarh, Dadra & Nagar Haveli and Lakshadweep are participating. The following is the matching pattern of the participating States/ UTs.

| | |
|---|---|
| Nagaland (Urban) | : triple |
| J & K , Manipur, Delhi & Uttar Pradesh | : double |
| Maharashtra (Urban) & Kerala | : one and half |
| Gujarat | : less than equal |
| Remaining States/ UTs | : equal |

## 3. Sample Design

3.1 **Outline of sample design:** A stratified multi-stage design has been adopted for the 66th round survey. The first stage units (FSU) are the 2001 census villages (Panchayat wards in case of Kerala) in the rural sector and Urban Frame Survey (UFS) blocks in the urban sector. In addition, two non-UFS towns of Leh and Kargil of Jammu & Kashmir are also treated as FSUs in the urban sector. The ultimate stage units (USU) are households in both the sectors. In case of large FSUs, one intermediate stage of sampling is the selection of two hamlet-groups (hgs)/ sub-blocks (sbs) from each rural/ urban FSU.

3.2 **Sampling Frame for First Stage Units:** *For the rural sector,* the list of 2001 census villages (henceforth the term óvillageô would mean Panchayat wards for Kerala) constitutes the sampling frame. *For the urban sector*, the list of latest available UFS blocks is considered as the sampling frame. For non-UFS towns, frame consists of the individual towns (only two towns, viz., Leh & Kargil constitute this frame).

3.3 **Stratification:** Within each district of a State/ UT, generally speaking, two basic strata have been formed: i) rural stratum comprising of all rural areas of the district and (ii) urban stratum comprising of all the urban areas of the district. However, within the urban areas of a district, wherever there are one or more towns with population 10 lakhs or more as per population census 2001 in a district, each of them forms a separate basic stratum and the remaining urban areas of the district are considered as another basic stratum.

3.4 **Sub-stratification**: There is no sub-stratification in the urban sector. However, to net adequate number of child workers, for all rural strata, each stratum has been divided into 2 sub-strata as follows:

sub-stratum 1: all villages with proportion of child workers (p) >2P (where P is the average proportion of child workers for the sate/ UT as per Census 2001)

sub-stratum 2: remaining villages

3.5 **Total sample size (FSUs):** 12784 FSUs for central sample and 15132 FSUs for state sample have been allocated at all-India level. Further, data of 24 state sample FSUs of Leh and Kargil districts of J & K surveyed by DES, J & K will be included in the central sample

3.6 **Allocation of total sample to States and UTs:** The total number of sample FSUs is allocated to the States and UTs in proportion to population as per census 2001 subject to a minimum sample allocation to each State/ UT. While doing so, the resource availability in terms of number of field investigators has been kept in view.

3.7 **Allocation of State/ UT level sample to rural and urban sectors:** State/ UT level sample size is allocated between two sectors in proportion to population as per *census 2001* with double weightage to urban sector subject to the restriction that urban sample size for bigger states like Maharashtra, Tamil Nadu etc. should not exceed the rural sample size. A minimum of 16 FSUs (to the extent possible) is allocated to each state/ UT separately for rural and urban areas. Further the State level allocations for both rural and urban have been adjusted marginally in a few cases to ensure that each stratum/ sub-stratum gets a minimum allocation of 4 FSUs.

3.8 **Allocation to strata/ sub-strata:** Within each sector of a State/ UT, the respective sample size is allocated to the different strata/ sub-strata in proportion to the population as per census 2001. Allocations at stratum/ sub-stratum level are adjusted to multiples of 4 with a minimum sample size of 4 and equal number of samples has been allocated among the four sub rounds.

3.9 **Selection of FSUs:** For the rural sector, from each stratum/ sub-stratum, required number of sample villages has been selected by probability proportional to size with replacement (PPSWR), size being the population of the village as per Census 2001. For urban sector, from each stratum FSUs have been selected by using Simple Random Sampling Without Replacement (SRSWOR). Both rural and urban samples have been drawn in the form of two independent sub-samples.

3.10 **Formation and selection of hamlet-groups/ sub-blocks**

3.10.1 **Criterion for hamlet-group/ sub-block formation:** Selected FSUs with approximate population 1200 or more are divided into a suitable number (say, D) of 'hamlet-groups' in the rural sector and 'sub-blocks' in the urban sector as stated below.

| approximate present population of the sample FSU | | no. of hgs/sbs to be formed |
|---|---|---|
| less than 1200 | (no hamlet-groups/sub-blocks) | 1 |
| 1200 to 1799 | | 3 |
| 1800 to 2399 | | 4 |
| 2400 to 2999 | | 5 |
| 3000 to 3599 | | 6 |
| é é é é ..and so on | | |

For rural areas of Himachal Pradesh, Sikkim, Uttarakhand (except four districts Dehradun (Plains), Nainital (Plains), Hardwar and Udham Singh Nagar), Poonch, Rajouri, Udhampur, Doda, Leh (Ladakh), Kargil districts of Jammu and Kashmir and Idukki district of Kerala, the number of hamlet-groups are formed as follows:

| approximate present population of the sample village | | no. of hgs to be formed |
|---|---|---|
| less than 600 | (no hamlet-groups) | 1 |
| 600 to 899 | | 3 |
| 900 to 1199 | | 4 |
| 1200 to 1499 | | 5 |
| .é é é ..and so on | | |

In case hamlet-groups/ sub-blocks are to be formed in the sample FSU, the same is done by more or less equalizing population.

3.10.2 **Selection of hamlet-groups/ sub-blocks:** Two hamlet-groups (hg)/ sub-blocks (sb) are selected from a large FSU wherever hamlet-groups/ sub-blocks are formed in the following manner ï one hg/ sb with maximum percentage share of population is always selected and termed as hg/ sb 1; one more hg/ sb is selected from the remaining hgôs/ sbôs by simple random sampling (SRS) and termed as hg/ sb 2. Listing and selection of the households is done independently in the two selected hamlet-groups/ sub-blocks. The FSUs without hg/ sb formation are treated as sample hg/ sb number 1.

4. **Listing of households:** Having determined the hamlet-groups/ sub-blocks, i.e. area(s) to be considered for listing, the next step is to list all the households (including those found to be temporarily locked after ascertaining the temporariness of locking of households through local enquiry). The hamlet-group/ sub-block with sample hg/ sb number 1 is considered for listing first, to be followed by the listing of households within the sample hg/ sb number 2.

5. **Formation of second stage strata and allocation of households**

5.1 Two cut-off points óAô and óBô (in Rs.) have been determined from NSS 61st round data for **each NSS region** for urban areas in such a way that top 10% of the population have MPCE more than óBô and bottom 30% of the population have MPCE less than A.

5.2: For both Schedule 1.0 and Schedule 10, households listed in the selected FSU/ hamlet-group/ sub-block are stratified into three second stage strata (SSS). Composition of the SSS and number of households to be surveyed from different SSS for each of the three schedules of enquiry namely, Schedule 1.0 (Type 1), Schedule 1.0 (Type 2) and Schedule 10 are as follows:

| SSS | composition of SSS | number of households to be surveyed | |
|---|---|---|---|
| | | FSU without hg/sb formation | FSU with hg/sb formation (for each hg/sb) |
| **Rural** | | | |
| SSS 1: | relatively affluent households | 2 | 1 |
| SSS 2: | of the remaining, households having principal earning from non- agricultural activity | 4 | 2 |
| SSS 3: | other households | 2 | 1 |
| **Urban** | | | |
| SSS 1: | households having MPCE of top 10% of urban population (MPCE > B) | 2 | 1 |
| SSS 2: | households having MPCE of middle 60% of urban population (A Ò MPCE Ò B) | 4 | 2 |
| SSS 3: | households having MPCE of bottom 30% of urban population (MPCE < A) | 2 | 1 |

6. **Selection of households:** From each SSS the sample households for each of the schedules are selected by SRSWOR. If a household is selected for more than one schedule, only one schedule is canvassed in that household in the priority order of Schedule 1.0 (Type 1), Schedule 1.0 (Type 2) and Schedule 10 and in that case the household would be replaced for the other schedule. If a household is selected for Schedule 1.0 (Type 1) it is not selected for Schedule 1.0 (Type 2) or Schedule 10. Similarly, if a household is not selected for Schedule 1.0 (Type 1) but selected for Schedule 1.0 (Type 2) it is not selected for Schedule 10.

However, at least one household is to be surveyed from each SSS for each of the three schedules of enquiry. To adhere to this restriction, the condition of not canvassing more than one schedule in the same household is waived in the extreme cases where there may be insufficient number of households in the frame of a particular second stage stratum.

## 7. **Estimation Procedure**

### 7.1 **Notations:**

s = subscript for s-th stratum

t = subscript for t-th sub-stratum (only for rural sector)

m = subscript for sub-sample (m =1, 2)

i = subscript for i-th FSU [village (panchayat ward)/ block/ non-UFS town]

d = subscript for a hamlet-group/ sub-block (d = 1, 2)

j = subscript for j-th second stage stratum in an FSU/ hg/sb [ j = 1, 2 or 3]

k = subscript for k-th sample household under a particular second stage stratum within an FSU/ hg/sb

D = total number of hgôs/ sbôs formed in the sample FSU

D* = 0 if D = 1

= (D ï 1) for FSUs with D > 1

N = total number of FSUs in any urban stratum

Z = total size of a rural stratum/sub-stratum (= sum of sizes for all the FSUs of a stratum/sub-stratum)

z = size of sample village used for selection.

n = number of sample FSUs surveyed including ózero casesô but excluding casualty for a particular sub-sample and stratum/sub-stratum.

H = total number of households listed in a second-stage stratum of an FSU / hamlet-group or sub-block of sample FSU

h = number of households surveyed in a second-stage stratum of an FSU / hamlet-group or sub-block of sample FSU

x, y = observed value of characteristics *x*, *y* under estimation

$\check{X}$, $\check{Y}$ = estimate of population total X, Y for the characteristics *x*, *y*

Under the above symbols,

$y_{stmidjk}$ = observed value of the characteristic y for the k-th household in the j-th second stage stratum of the d-th hg/ sb (d = 1, 2) of the i-th FSU belonging to the m-th sub-sample for the t-th sub-stratum of s-th stratum.

However, for ease of understanding, a few symbols have been suppressed in following paragraphs where they are obvious.

7.2 **Formulae for Estimation of Aggregates for a particular sub-sample and stratum (for urban) / sub-stratum (for rural):**

7.2.1 **Schedule 0.0:**

7.2.1.1 **Rural:**

(i) For estimating the number of households in a stratum/sub-stratum possessing a characteristic:

$$\hat{Y} = \frac{Z}{n}\sum_{i=1}^{n}\frac{1}{z_i}\left[y_{i1} + D_i^* \times y_{i2}\right]$$

where $y_{i1}$ , $y_{i2}$ are the total number of households possessing the characteristic $y$ in hgôs 1 & 2 of the i-th FSU respectively.

(ii) For estimating the number of villages in a stratum possessing a characteristic:

$$\hat{Y} = \frac{Z}{n}\sum_{i=1}^{n}\frac{1}{z_i}y_i$$

where $y_i$ is taken as 1 for sample villages possessing the characteristic and 0 otherwise.

7.2.1.2 **Urban:**

(i) For estimating the number of households in a stratum possessing a characteristic:

$$\hat{Y} = \frac{N}{n}\sum_{i=1}^{n}\left[y_{i1} + D_i^* \times y_{i2}\right]$$

where $y_{i1}$ and $y_{i2}$ are the total number of households possessing the characteristic $y$ belonging to sub-blocks 1 and 2 respectively, of the i-th FSU.

Note: *There are only one FSU each in the districts Leh (Leh town) and Kargil (Kargil town) of J & K. Both of these have been selected and repeated in each of the sub-rounds. Thus, in this case, N = 1 in the above formula and n will be the number of FSUs actually surveyed including repetitions (n = 4 for the whole round and n = 2 for a sub-sample of the whole round assuming no casualty) for each of the two districts.*

7.2.2 **Schedules 1.0 (Type 1) / 1.0 (Type 2) / 10:**

7.2.2.1 **Rural:**

(i) For j-th second stage stratum of a sub-stratum:

$$\hat{Y}_j = \frac{Z}{n_j}\sum_{i=1}^{n_j}\frac{1}{z_i}\left[\frac{H_{i1j}}{h_{i1j}}\sum_{k=1}^{h_{i1j}} y_{i1jk} + D_i^* \times \frac{H_{i2j}}{h_{i2j}}\sum_{k=1}^{h_{i2j}} y_{i2jk}\right]$$

(ii) For all second-stage strata combined:

$$\hat{Y} = \sum_j \hat{Y}_j$$

(iii) Estimate for a stratum ($\hat{Y}_s$) will be obtained by adding sub-stratum level estimates ($\hat{Y}_{st}$).

7.2.2.2 **Urban:**

(i) For j-th second stage stratum of a stratum:

$$\hat{Y}_j = \frac{N}{n_j}\sum_{i=1}^{n_j}\left[\frac{H_{i1j}}{h_{i1j}}\sum_{k=1}^{h_{i1j}} y_{i1jk} + D_i^* \times \frac{H_{i2j}}{h_{i2j}}\sum_{k=1}^{h_{i2j}} y_{i2jk}\right]$$

(ii) For all second-stage strata combined:

$$\hat{Y} = \sum_j \hat{Y}_j$$

Note: *As mentioned earlier in section 7.2.1.2, N = 1 in the above formula in the case of Leh and Kargil districts of J & K.*

7.3 **Overall Estimate for Aggregates**:

Overall estimate for aggregates for a stratum ($\hat{Y}_s$) based on two sub-samples is obtained as:

$$\hat{Y}_s = \frac{1}{2}\sum_{m=1}^{2}\hat{Y}_{sm}$$

7.4 **Overall Estimate of Aggregates at State/UT/all-India level**:

The overall estimate $\hat{Y}$ at the State/ UT/ all-India level is obtained by summing the stratum estimates $\hat{Y}_s$ over all strata belonging to the State/ UT/ all-India.

7.5 **Estimates of Ratios**:

Let $\hat{Y}$ and $\hat{X}$ be the overall estimates of the aggregates Y and X for two characteristics *y* and *x* respectively at the State/ UT/ all-India level.

Then the combined ratio estimate $(\hat{R})$ of the ratio $(R = \frac{Y}{X})$ will be obtained as $\hat{R} = \frac{\hat{Y}}{\hat{X}}$.

7.6 **Estimates of Error**: The estimated variances of the above estimates will be as follows:

7.6.1 **For aggregate** $\hat{Y}$:

$Var(\hat{Y}) = \sum_s Var(\hat{Y}_s)$ where $Var(\hat{Y}_s)$ is given by

$Var(\hat{Y}_s) = \sum_t \frac{1}{4}\left(\hat{Y}_{st1} - \hat{Y}_{st2}\right)^2$ for rural stratum, where $\hat{Y}_{st1}$ and $\hat{Y}_{st2}$ are the estimates for sub-sample 1 and sub-sample 2 respectively for stratum ósô and sub-stratum ótô

and

$Var(\hat{Y}_s) = \frac{1}{4}\left(\hat{Y}_{s1} - \hat{Y}_{s2}\right)^2$ for urban stratum, $\hat{Y}_{s1}$ and $\hat{Y}_{s2}$ being the stratum estimates for sub-sample 1 and 2 respectively.

7.6.2 **For ratio** $\hat{R}$:

$$MSE(\hat{R}) = \frac{1}{4\hat{X}^2}\sum_s\sum_t\left[\left(\hat{Y}_{st1} - \hat{Y}_{st2}\right)^2 + \hat{R}^2\left(\hat{X}_{st1} - \hat{X}_{st2}\right)^2 - 2\hat{R}\left(\hat{Y}_{st1} - \hat{Y}_{st2}\right)\left(\hat{X}_{st1} - \hat{X}_{st2}\right)\right]$$

for rural and

$$MSE(\hat{R}) = \frac{1}{4\hat{X}^2}\sum_s\left[\left(\hat{Y}_{s1} - \hat{Y}_{s2}\right)^2 + \hat{R}^2\left(\hat{X}_{s1} - \hat{X}_{s2}\right)^2 - 2\hat{R}\left(\hat{Y}_{s1} - \hat{Y}_{s2}\right)\left(\hat{X}_{s1} - \hat{X}_{s2}\right)\right]$$

for urban.

7.6.3 **Estimates of Relative Standard Error (RSE)**:

$$RSE(\bar{y}) = \frac{\sqrt{Var(\bar{y})}}{\bar{y}} \times 100$$

$$RSE(\hat{R}) = \frac{\sqrt{MSE(\hat{R})}}{\hat{R}} \times 100$$

8. **Multipliers**:

The formulae for multipliers at stratum/sub-stratum/second-stage stratum level for a sub-sample and schedule type are given below:

| sch type | sector | formula for multipliers | |
|---|---|---|---|
| | | hg / sb 1 | hg / sb 2 |
| 0.0 | rural | $\frac{Z_{st}}{n_{stm}} \times \frac{1}{z_{stmi}}$ | $\frac{Z_{st}}{n_{stm}} \times \frac{1}{z_{stmi}} \times D^{*}_{stmi}$ |
| | Urban | $\frac{N_s}{n_{sm}}$ | $\frac{N_s}{n_{sm}} D^{*}_{smi}$ |
| 1.0 (Type 1)/ 1.0 (Type 2)/ 10 | rural | $\frac{Z_{st}}{n_{stmj}} \times \frac{1}{z_{stmi}} \times \frac{H_{stmi1j}}{h_{stmi1j}}$ | $\frac{Z_{st}}{n_{stmj}} \times \frac{1}{z_{stmi}} \times D^{*}_{stmi} \times \frac{H_{stmi2j}}{h_{stmi2j}}$ |
| | Urban | $\frac{N_s}{n_{smj}} \times \frac{H_{smi1j}}{h_{smi1j}}$ , | $\frac{N_s}{n_{smj}} \times D^{*}_{smi} \times \frac{H_{smi2j}}{h_{smi2j}}$ , |
| | ( j = 1, 2, 3) | | |

Note: (i) For estimating any characteristic for any domain not specifically considered in sample design, indicator variable may be used.

(ii) Multipliers have to be computed on the basis of information available in the listing schedule irrespective of any misclassification observed between the listing schedule and detailed enquiry schedule.

(iii) For estimating number of villages possessing a characteristic, $D^{*}_{stmi}$ = 0 in the relevant multipliers and there will be only one multiplier for the village (see paragraph 7.2.1.1 in this context).

9. **Treatment for zero cases, casualty cases etc.**:

9.1 While counting the number of FSUs surveyed ($n_{sm}$ or $n_{stm}$ ) in a stratum/sub-stratum, all the FSUs with survey codes 1 to 6 in schedule 0.0 will be considered. In addition, if no SSU is available in the frame for a particular schedule then also that FSU will be treated as surveyed in respect of that schedule. However, if the SSUs of a particular schedule type are available in the frame of the FSU but none of these could be surveyed then that FSU has to be treated as casualty and it will not be treated as surveyed in respect of that schedule.

9.2 *Casualty cases*: FSUs with survey code 7 as per schedule 0.0 are treated as casualties. In addition to this, an FSU, although surveyed, may have to be treated as casualty for a particular schedule type and a particular *second stage stratum* as given in the following para:

9.2.1 FSUs with survey codes 1 or 4 as per schedule 0.0 having number of households in the frame of j-th second stage stratum greater than 0 but number of households surveyed according to data file, considering both hg/sb together, as nil (i.e. $H_{i1j} + H_{i2j} > 0$ but $h_{i1j} + h_{i2j} = 0$) will be taken as casualties for j-th second stage stratum.

*All the FSUs with survey codes 1 to 6 as per schedule 0.0 minus the number of casualties as identified above will be taken as the number of surveyed FSUs ($n_{stmj}$ ) for that (stratum/sub-stratum) ×( second stage stratum).*

When casualty for j-th second stage stratum occurs for a particular hg/sb but not for the other hg/sb, the FSU will not be treated as casualty but some adjustments in the value of H for the other hg/sb will be done as follows:

(i) Suppose for hg/sb 1, $H_{i1j} > 0$ but $h_{i1j} = 0$ while for hg/sb 2, $H_{i2j} > 0$ and $h_{i2j} > 0$. In that case $D_i^* \times H_{i2j}$ will be replaced by $(H_{i1j} + D_i^* \times H_{i2j})$ in the formula for multiplier of hg/sb 2.

(ii) Suppose for hg/sb 1, $H_{i1j} > 0$ and $h_{i1j} > 0$ while for hg/sb 2, $H_{i2j} > 0$ but $h_{i2j} = 0$. In that case $H_{i1j}$ will be replaced by $(H_{i1j} + D_i^* \times H_{i2j})$ in the formula for multiplier of hg/sb 1.

It may be noted that $n_{smj}$ or $n_{stmj}$ would be same for hg/sb 1 & 2 of an FSU.

10. **Treatment in cases of void second-stage strata/sub-strata /strata/NSS region at FSU or household level**

10.1 A stratum/sub-stratum may be void because of the casualty of all the FSUs belonging to the stratum/sub-stratum. This may occur in one sub-sample or in both the sub-samples. If it relates to only one sub-sample, then estimate for the void stratum/sub-stratum may be replaced with the estimate as obtained from the other sub-sample for the same stratum/sub-stratum.

10.2 When a stratum/sub-stratum is void in both the sub-samples, the following procedure is recommended:

*Case(I): Stratum/Sub-stratum void cases at FSU levels (i.e. all FSUs having survey code 7)*:

(i) If an rural sub-stratum is void then it may be merged with the other sub-stratum of the stratum.

(ii) If a rural/urban stratum (district) is void due to all FSUs being casualty, it may be excluded from the coverage of the survey. The state level estimates will be based on the estimates of districts for which estimates are available and remarks to that effect may be added in appropriate places.

*Case (II): Stratum/Sub-stratum void case at second stage stratum level (i.e. all the FSUs are casualties for a particular second stage stratum*):

An FSU may be a casualty for a particular *second stage stratum* although survey code is not 7. If all the FSUs of a stratum/sub-stratum become casualties in this manner for a particular *second stage stratum*, the stratum/sub-stratum will become void. In such cases, sub-strata will be merged with other sub-strata for all the second stage strata as in *Case (I) above.*

However, if whole district/stratum becomes void in this manner for a particular second stage stratum, adjustment for this type of stratum void case may be done according to the following guidelines.

The adjustment will be made involving other strata/sub-strata (within NSS region) of the State/U.T. Suppose A, B, C and D are the four strata in the State/UT/Region and stratum C is void for j-th *second stage stratum*. If $\check{Y}_{aj}$, $\check{Y}_{bj}$ and $\check{Y}_{dj}$ are the aggregate estimates for the strata/sub-strata A, B and D respectively, then the estimate $\check{Y}_{cj}$ for stratum/sub-stratum C may be obtained as $\left(\frac{\check{Y}_{aj}+\check{Y}_{bj}+\check{Y}_{dj}}{Z_a+Z_b+Z_d}\times Z_c\right)$ where $Z_a$, $Z_b$, $Z_c$ and $Z_d$ are the sizes of strata A, B, C and D respectively.

11. **Reference to the values of $Z_{st}$, $N_s$, $n_{st}$, $n_s$, $z_{sti}$, $D_{sti}$, $D^*_{sti}$, $D_{si}$, $D^*_{si}$, $H_{sti1j}$, $h_{sti1j}$, $H_{sti2j}$, $h_{sti2j}$**:

(a) Values of $\mathbf{Z_{st}}$, $\mathbf{N_s}$ and allotted $\mathbf{n_{st}}$ or $\mathbf{n_s}$ for the whole round are given in appendix Table 2 for rural sector and in Table 3 for urban sector.

(b) $\mathbf{n_{st}}$ or $\mathbf{n_s}$ should not be taken from the tables. The values of $\mathbf{n_{stm}}$ or $\mathbf{n_{sm}}$ for each sub-sample are to be obtained following the guidelines given in para 9 above. It includes uninhibited and zero cases but excludes casualty cases.

(c) The value of $\mathbf{z_{sti}}$ for the samples selected by PPS is to be taken from the column of sample list under the heading ñframe populationò for rural samples. Value of $\mathbf{D_{sti}}$ or $\mathbf{D_{si}}$ is to be taken from item 16 of block 1, sch 0.0. $\mathbf{D^*_{sti}}$ or $\mathbf{D^*_{si}}$ is to be calculated from the value of $D_{sti}$ or $\mathbf{D_{si}}$.

(d) Values of $\mathbf{H_{sti1j}}$ /$\mathbf{H_{si1j}}$, $\mathbf{H_{sti2j}}$ /$\mathbf{H_{si2j}}$ are to be taken from col.(7), block 6 of sch 0.0 for respective hg/sb.

(e) The value of $\mathbf{h_{sti1j}}$ /$\mathbf{h_{si1j}}$ and $\mathbf{h_{sti2j}}$ /$\mathbf{h_{si2j}}$ should not be taken from col (11), block 6 of sch.0.0. The figures should be obtained by counting the number of households in the data file excluding the casualty households.

********

**APPENDICES**

**Table 1: Distribution of sample villages and blocks**

| State/UT | | number of sample villages/blocks | | | | | |
|---|---|---|---|---|---|---|---|
| | | central sample | | | state sample | | |
| code | name | total | rural | urban | total | rural | urban |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 01 | JAMMU & KASHMIR | 456* | 276* | 180* | 864 | 520 | 344 |
| 02 | HIMACHAL PRADESH | 256 | 208 | 48 | 256 | 208 | 48 |
| 03 | PUNJAB | 392 | 196 | 196 | 392 | 196 | 196 |
| 04 | CHANDIGARH | 40 | 4 | 36 | 0 | 0 | 0 |
| 05 | UTTARANCHAL | 224 | 132 | 92 | 224 | 132 | 92 |
| 06 | HARYANA | 328 | 180 | 148 | 328 | 180 | 148 |
| 07 | DELHI | 128 | 8 | 120 | 256 | 16 | 240 |
| 08 | RAJASTHAN | 520 | 324 | 196 | 520 | 324 | 196 |
| 09 | UTTAR PRADESH | 1128 | 740 | 388 | 2256 | 1480 | 776 |
| 10 | BIHAR | 576 | 416 | 160 | 576 | 416 | 160 |
| 11 | SIKKIM | 96 | 76 | 20 | 96 | 76 | 20 |
| 12 | ARUNACHAL PRADESH | 216 | 140 | 76 | 216 | 140 | 76 |
| 13 | NAGALAND | 128 | 88 | 40 | 208 | 88 | 120 |
| 14 | MANIPUR | 320 | 172 | 148 | 640 | 344 | 296 |
| 15 | MIZORAM | 192 | 80 | 112 | 192 | 80 | 112 |
| 16 | TRIPURA | 232 | 164 | 68 | 232 | 164 | 68 |
| 17 | MEGHALAYA | 160 | 108 | 52 | 160 | 108 | 52 |
| 18 | ASSAM | 432 | 328 | 104 | 432 | 328 | 104 |
| 19 | WEST BENGAL | 792 | 448 | 344 | 792 | 448 | 344 |
| 20 | JHARKHAND | 344 | 220 | 124 | 344 | 220 | 124 |
| 21 | ORISSA | 504 | 372 | 132 | 504 | 372 | 132 |
| 22 | CHATTISGARH | 280 | 188 | 92 | 280 | 188 | 92 |
| 23 | MADHYA PRADESH | 592 | 344 | 248 | 592 | 344 | 248 |
| 24 | GUJARAT | 432 | 216 | 216 | 320 | 160 | 160 |
| 25 | DAMAN & DIU | 16 | 8 | 8 | 16 | 8 | 8 |
| 26 | D & N HAVELI | 24 | 12 | 12 | 0 | 0 | 0 |
| 27 | MAHARASTRA | 1008 | 504 | 504 | 1260 | 504 | 756 |
| 28 | ANDHRA PRADESH | 864 | 492 | 372 | 864 | 492 | 372 |
| 29 | KARNATAKA | 512 | 256 | 256 | 512 | 256 | 256 |
| 30 | GOA | 56 | 20 | 36 | 56 | 20 | 36 |
| 31 | LAKSHADWEEP | 24 | 8 | 16 | 0 | 0 | 0 |
| 32 | KERALA | 560 | 328 | 232 | 840 | 492 | 348 |
| 33 | TAMIL NADU | 832 | 416 | 416 | 832 | 416 | 416 |
| 34 | PONDICHERRY | 72 | 16 | 56 | 72 | 16 | 56 |
| 35 | A & N ISLANDS | 72 | 36 | 36 | 0 | 0 | 0 |
| **ALL** | | **12808*** | **7524*** | **5284*** | **15132** | **8736** | **6396** |

**Includes 16 rural and 8 urban samples to be surveyed in the state sample only by DES, J & K and schedules of which are to be sent to DPD for inclusion in the central sample data.*