Introduction

The PRSP, the MDGs and the PSLM

The Pakistan Social and Living Standards Measurement Survey is one of the main mechanisms for monitoring the implementation of the PRSP and MDGs indicators. It provides a set of representative, population-based estimates of social indicators and their progress under the PRSP. For Millennium Development Goals (MDGs), UN has set 18 targets for 48 indicators for its member countries to achieve by 2015. Pakistan has committed to implement 16 targets, 37 indicators out of which 15 indicators are to be monitored through PSLM Surveys. These include intermediate as well as 'output' measures, which assess what is being provided by the social sectors – enrolment rates in education, for example. These include a range of 'outcome' measures, which assess the welfare of the population – Immunisation Rate, for example.

An important objective of the PSLM Survey is to try to establish what the distributional impact of PRSP has been. Policymakers need to know, for example, whether the poor have benefited from the programme or whether increased government expenditure on the social sectors has been captured by the better off.

In the remainder of this introduction, a description of the 2007-08 PSLM Survey is provided.

SAMPLE DESIGN OF PSLM SURVEY 2007-08

Universe: The universe of this survey consists of all urban and rural areas of the four provinces and Islamabad excluding military restricted areas.

Sampling Frame: FBS has developed its own urban area frame, which was up-dated in 2003.Each city/town has been divided into enumeration blocks consisting of 200-250 households identifiable through sketch map. Each enumeration block has been classified into three categories of income groups i.e. low, middle and high keeping in view the living standard of the majority of the people. List of villages published by Population Census Organization obtained as a consequence of Population Census 1998 has been taken as rural frame.

Stratification Plan:

A. Urban Domain: Islamabad, Lahore, Gujranwala, Faisalabad, Rawalpindi, Multan, Bahawalpur, Sargodha, Sialkot, Karachi, Hyderabad, Sukkur, Peshawar and Quetta, have been considered as large sized cities. Each of these cities constitutes a separate stratum and has further been sub-stratified according to low, middle and high-income groups. After excluding population of large sized city (s), the remaining urban population in each defunct Division in all the provinces has been grouped together to form a stratum.

B. Rural Domain: Each district in the Punjab, Sindh and NWFP provinces has been grouped together to constitute a stratum. Whereas defunct administrative Division has been treated as stratum in Balochistan province.

Sample Size and Its Allocation: Keeping in view the objectives of the survey the sample size for the four provinces has been fixed at 15512 households comprising 1113 sample village/ enumeration blocks, which is expected to produce reliable results.

Sample Design: A two-stage stratified sample design has been adopted in this survey.

Selection of Primary Sampling Units (PSUs): Villages and enumeration blocks in urban and rural areas respectively have been taken as Primary Sampling Units (PSUs). Sample PSUs have been selected from strata/sub-strata with PPS method of sampling technique.

Selection of Secondary Sampling Units (SSUs): Households within sample PSUs have been taken as Secondary Sampling Units (SSUs). A specified number of households i.e. 16 and 12 from each sample PSU of rural & urban area have been selected respectively using systematic sampling technique with a random start. Detailed sampling plan is given in Appendix-A.

Household and Survey questionnaire

At both individual and household level, the PSLM Survey collects information on a wide range of topics using an integrated questionnaire. The questionnaire comprises a number of different sections, each of which looks at a particular aspect of household behaviour or welfare. Data collected under this Round includes education, diarrhoea, immunisation, reproductive health, pregnancy history, maternity history, family planning, pre and post-natal care and access to basic services.

Objectives and scope of analysis

This is the fourth round of the PSLM's series of surveys to be conducted in between 2004-2009. The PSLM is a large, complex household survey that collects information on a number of different sections.. The methodology of computing quintiles based on consumption is explained in Appendix-B.

Data Quality and Reliability Measures

Data quality in PSLM Survey has been ensured through a built in system of checking of field work by the supervisors in the field as well as teams from the headquarters. Regional/ Field offices ensured the data quality through preliminary editing at their office level. The entire data entry was carried at the FBS headquarter Islamabad and the data entry programme used had a number of in built consistency checks. To determine the reliability of the estimates,

APPENDIX A: SAMPLE DESIGN FOR PAKISTAN SOCIAL AND LIVING STANDARDS MEASUREMENT SURVEY, 2007-08

Objectives:

The data generated though PSLM Survey will be used to assist the government in formulating the poverty reduction strategy in the overall context of MDGs. The indicators will be developed at National/Provincial level in the following sectors.

1. Education
2. Health
3. Water Supply & Sanitation.
4. Population Welfare
5. Income & Expenditure

Universe:

The universe of this survey consists of all urban and rural areas of all four provinces. Military restricted and protected areas of NWFP have been excluded from the scope of the survey.

SAMPLING FRAME

Urban area:

FBS has developed its own urban area frame. All urban areas comprising cities/ towns have been divided into small compact areas known as enumeration blocks (E.Bs) identifiable through map. Each enumeration block comprises about 200-250 households and categorized into low, middle and high-income group, keeping in view the socio economic status of the majority of households. Urban area sampling frame consists of 26698 enumeration blocks has been updated in 2003.

Rural area:

With regard to the rural areas, the lists of villages/mouzas/dehs according to Population Census, 1998 have been used as sampling frame. In this frame, each village/mouza/deh is identifiable by its Name, Had Bast Number, Cadastral map etc. This frame is comprised of 50590 villages/mouzas.

The numbers of enumeration blocks in urban and mouzas/dehs/villages in rural areas of the country are as under:

NO. OF ENUMERATION BLOCKS AND VILLAGES AS PER SAMPLING FRAME

Province	Number of E. Blocks	Number of Villages
Punjab	14,549	25,875
Sindh	9,025	5,871
NWFP	1,913	7,337
Balochistan	613	6,557
A.J.K	210	1,654
Northern Area	64	566
FATA		2,596
Islamabad	324	132
Total	**26,698**	**50,588**

STRATIFICATION PLAN

Urban Areas:

Large sized cities having population five lacs and above have been treated as independent stratum. Each of these cities has further been sub-stratified into low, middle and high income groups. The remaining cities/towns within each defunct administrative division have been grouped together to constitute an independent stratum.

Rural Areas:

The entire rural domain of a district for Punjab, Sindh and NWFP provinces has been considered as independent stratum, whereas in Balochistan province defunct administrative division has been treated as stratum

Sample Size and its Allocation:

To determine optimum sample size for this survey, analytical studies based on the results of Pakistan Demographic Survey, Labour Force and Pakistan Integrated Households Sample Survey were undertaken. Keeping in view the variability which exists within the population for the characteristics for which estimates are to be prepared, population distribution, level of estimates and field resources available a sample size of 15,512 households enumerated from 1113 sample PSUs (532 from urban and 581 from rural areas) has been considered sufficient to produce reliable estimates in respect of all provinces. The distribution plan of PSUs and SSUs by province and region is as under:-

PROFILE OF THE PSLM SAMPLE 2007-08

PROVINCE	2007-08 PSLM		
	URBAN	RURAL	TOTAL
PSUs:			
Punjab	240	244	484
Sindh	140	131	271
NWFP	88	118	206
Balochistan	64	88	152
Overall	**532**	**581**	**1113**
SSUs/Households			
Punjab	2768	3868	6636
Sindh	1672	2093	3765
NWFP	1049	1888	2937
Balochistan	766	1408	2174
Overall	**6255**	**9257**	**15512**

Sample Design: A two-stage stratified sample design has been adopted for this survey.

Selection of primary sampling Units (PSUs):

Enumeration blocks in the urban domain and mouzas/dehs/villages in rural domain have been taken as primary sampling units (PSUs). In urban domain sample PSUs from each stratum have been selected by probability proportional to size (PPS) method of sampling scheme; using households in each block as measure of size (MOS). Similarly in rural areas, population of each village has been taken as MOS for selection of sample villages using probability proportional to size method of selection.

Selection of Secondary Sampling Units (SSUs):

Households within each sample Primary Sampling Unit (PSU) have been considered as Secondary Sampling Units (SSUs). 16 and 12 households have been selected from each sample village and enumeration block respectively by systematic sampling scheme with a random start.

Estimation Procedures:

Detail of estimation procedures for estimates and their variances is attached as

Annexure – I

Annexure-I

Estimation Procedure:

ESTIMATION PROCEDURE ADOPTED FOR PSLM SURVEY

NOTATIONS:

N_h = Total number of Primary Sampling Units (PSUs) in the hth stratum of a province.

n_h = Total number of sample PSUs in the hth stratum of a province.

M_{hi} = Total number of Secondary Sampling Units (SSUs) in the ith sample PSU of hth stratum of a province.

m_{hi} = Number of sample SSUs in the ith sample PSU of hth stratum of a province.

P_{hi} = Assigned probability of selection of ith PSU of the hth stratum of a province.

y_{hij} = Value of any characteristic y of jth SSU within ith PSU of hth stratum of a province.

x_{hij} = Value of any characteristic x of jth SSU within ithPSU of hth stratum of a province with whose respect proportion is required.

(i): ESTIMATION FORMULAE FOR TOTALS AND THEIR VARIANCES

$$N = \sum_{h=1}^{L} N_h$$

$$n = \sum_{h=1}^{L} n_h$$

$$\hat{Y}_h = \frac{1}{n_h} \sum_{i=1}^{n_h} \frac{\hat{Y}_{hi}}{p_{hi}}$$

OR

$$\hat{Y}_h = \frac{1}{n_h} \sum_{i=1}^{n_h} \frac{1}{p_{hi}} \frac{M_{hi}}{m_{hi}} \sum_{j=1}^{m_{hi}} y_{hij}$$

$$\hat{Y} = \sum_{h=1}^{L} \hat{Y}_h = \sum_{h=1}^{L} \frac{1}{n_h} \sum_{i=1}^{n_h} \frac{\hat{Y}_{hi}}{p_{hi}}$$

For X, another variable of interest, we have

$$\hat{X}_h = \frac{1}{n_h} \sum_{i=1}^{n_h} \frac{\hat{X}_{hi}}{P_{hi}} = \frac{1}{n_h} \sum_{i=1}^{n_h} \frac{1}{P_{hi}} \frac{M_{hi}}{m_{hi}} \sum_{j=1}^{m_{hi}} x_{hij}$$

$$\hat{X} = \sum_{h=1}^{L} \hat{X}_h = \sum_{h=1}^{L} \frac{1}{n_h} \sum_{i=1}^{n_h} \frac{\hat{X}_{hi}}{p_{hi}}$$

$$\hat{R} = \frac{\hat{Y}}{\hat{X}}$$

$$v(\hat{y}_h) = \frac{1}{n_h} s^2{}_{ht} = \frac{1}{n_h(n_h-1)} \left(\sum_{i=1}^{n_h} \frac{\hat{Y}^2{}_{hi}}{P^2{}_{hi}} - \frac{(\sum_{i=1}^{n_h} \frac{\hat{y}_{hi}}{P_{hi}})^2}{n_h} \right)$$

$$v(\hat{Y}) = \sum_{h=1}^{L} \frac{1}{n_h} s^2{}_{ht} = \sum_{h=1}^{L} \frac{1}{n_h(n_h-1)} \left(\sum_{i=1}^{n_h} \frac{\hat{Y}^2{}_{hi}}{P^2{}_{hi}} - \frac{(\sum_{i=1}^{n_h} \frac{\hat{y}_{hi}}{P_{hi}})^2}{n_h} \right)$$

(ii): FORMULA FOR RATIO ESTIMATES

$$r = \frac{\hat{Y}}{\hat{X}}$$

where $Y^{\wedge}$ and $X^{\wedge}$ can be estimated by equations under item (i) given above.

$$Rel\ V(r) = \frac{1}{\hat{X}^2} \sum_{h=1}^{L} \frac{1}{n_h} s^2{}_{hb} + \frac{1}{\hat{x}^2} \sum_{h=1}^{L} \frac{1}{n_h} \sum_{i=1}^{n_h} \frac{M^2{}_{hi}}{p^2{}_{hi} m_{hi}} \frac{(M_{hi} - m_{hi})}{M_{hi}} s^2{}_{hw}$$

where

$s^2_{hb} = s^2_{ht} - s^2_{hw}$

$$s^2{}_{ht} = s^2{}_{hy} + r^2 s^2{}_{hx} - 2r s_{hxy}$$

$$s^2{}_{hx} = \frac{1}{(n_h - 1)} \left[\sum_{i=1}^{n_h} \frac{\hat{x}^2{}_{hi}}{p^2{}_{hi}} - \frac{\left(\sum_{i=1}^{n_h} \frac{\hat{x}_{hi}}{p_{hi}} \right)^2}{n_h} \right]$$

$$s^2_{hy} = \frac{1}{(n_h - 1)}\left[\sum_{i=1}^{n_h}\frac{\hat{y}^2_{hi}}{p^2_{hi}} - \frac{\left(\sum_{i=1}^{n_h}\frac{\hat{y}_{hi}}{p_{hi}}\right)^2}{n_h}\right]$$

$$s_{hxy} = \frac{1}{n_h - 1}\left[\sum_{i=1}^{n_h}\left(\frac{\hat{X}_{hi}}{p_{hi}}\frac{\hat{y}_{hi}}{p_{hi}}\right) - \frac{\left(\sum_{i=1}^{n_h}\frac{\hat{X}_{hi}}{P_{hi}}\right)\left(\sum_{i=1}^{n_h}\frac{\hat{y}_{hi}}{P_{hi}}\right)}{n_h}\right]$$

$$s^2_{hw} = \frac{1}{n_h - 1}\sum_{i=1}^{n_h}\frac{1}{p^2_{hi}}\frac{M^2_{hi}}{m_{hi}}\frac{(M_{hi} - m_{hi})}{M_{hi}}s^2_{hi}$$

and

$$s^2_{hi} = s^2_{hiy} + r^2 s^2_{hix} - 2r\, s_{hixy}$$

$$s^2_{hiy} = \frac{1}{(m_{hi} - 1)}\left[\sum_{j=1}^{m_{hi}} y^2_{hij} - \frac{\left(\sum_{j=1}^{m_{hi}} y_{hij}\right)^2}{m_{hi}}\right]$$

$$s^2_{hix} = \frac{1}{(m_{hi} - 1)}\left[\sum_{j=1}^{m_{hi}} x^2_{hij} - \frac{\left(\sum_{j=1}^{m_{hi}} x_{hij}\right)^2}{m_{hi}}\right]$$

$$s^2_{hixy} = \frac{1}{(m_{hi} - 1)}\left[\sum_{j=1}^{m_{hi}} x_{hij}\, y_{hij} - \frac{\left(\sum_{j=1}^{m_{hi}} x_{hij}\sum_{j=1}^{m_{hi}} y_{hij}\right)}{m_{hi}}\right]$$

Appendix B: Consumption Quintiles

Consumption quintiles are used to distinguish the population according to their welfare: poorest households are grouped together into the 1st quintile, those with higher consumption into the 2nd quintile, and so on. Five quintiles rank the population from the poorest 20% to the richest 20%. The main aim of quintile is to analyze how social and economic indicators change in relation to people's welfare. For instance, the government wants to know whether poorer households have access to basic services (immunization, schools, safe water etc.) or whether there are significant differences between the poor and the rich. Furthermore, policy makers are interested to know how consumption patterns and income sources of poorer households are different from those of richer households. Estimates by quintiles describe distributional differences, thus representing an important tool of analysis.

Quintiles are calculated for the four provinces together (Punjab, Sindh, NWFP and Balochistan) so that the first quintile contains in all provinces households with the same welfare. However, if one province is relatively richer than others; its population will not be evenly distributed in each quintile, but mostly concentrated in the higher quintiles. In fact, only at the overall level each quintile contains 20% of the population, but in urban areas, where people usually are richer, upper quintiles contain higher population percentages, and the opposite is true for rural areas (see table 1 and 2).

Consumption expenditure is used as a proxy to assess people's welfare. Expenditure is calculated at the household level but it is adjusted by household size and its composition. The adjustment is necessary to assess a proper ranking of households. Reasons can become clear with some examples. Imagine two households both with a monthly consumption expenditure of Rs. 3000. However, it would be wrong to say that both households enjoy the same welfare without considering their household size and composition. For instance, one household may be composed by one single individual whereas the other by five people.