

ABSOLUTE POVERTY IN PAKISTAN : WHERE ARE THE POOR CONCENTRATED?

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ABSTRACT

This study is an attempt to draw a consistent and comparable absolute poverty line and to figure out geographical and sectoral concentration of poverty using data sets of Pakistan Integrated Household Survey 2001-02 and Pakistan Living Standard Measurement Survey 2004-05. Households with adult equivalent consumption below a consumption level necessary to acquire basic needs are defined as poor. The estimated base poverty line is updated by Tornqvist Price Index (TPI). Geographical and sectoral concentration index are obtained capturing contribution to the national poverty in relation to their respective share in national population. Estimates of various poverty measures suggest that official poverty figures are a bit underestimated that basically stems from the methodology followed for inflating the base poverty line through Consumer Price Index (CPI). In relation to urban areas, rural areas show higher concentration of poverty and NWFP, followed by Baluchistan, experience greater concentration of poverty compared to Sind and Punjab. Sector-wise, relative to other sectors poverty is more concentrated in construction and agriculture sectors.

Key Words: *Absolute poverty, Tornqvist Price Index, Concentration index*

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INTRODUCTION

Poverty is an international phenomenon. Some recent global estimates on poverty (based on one dollar a day) suggest around 1.2 billion people live in poverty and more than 850 million does not have enough access to sufficient food for an active and healthy life. Of the total global population who live on less than a dollar a day, 1.089 billion live in developing countries and 0.431 billion live in South Asia, the region to which Pakistan is a part of; while of the total undernourished people, 815 million and 301 million people reside in developing countries and South Asian Countries respectively (FAO 2005).

In terms of Human Development Index Pakistan is ranked at 136 out of 177 countries; well behind some of its neighboring countries like Sri Lanka with a ranking of 99, India 128 and Bhutan 133 (UNDP 2008). According to FAO (2005) 20% of its total population (29.3 million people) is undernourished and 32.6% is under poverty line in 2000-2002. Recent estimates of people living in poverty, based on 1 dollar a day, suggest that 17 % of the population live below poverty line in 2005 whereas based on 2 dollar a day criteria, the figure stand out at 73.6 %, more than two third of the population (UNDP 2008).

Much has been written on poverty in Pakistan over the last three and half decades. These studies not only presented the magnitude and trend in poverty but also helped policy decision making on designing and refining poverty alleviation programs. While there is no dearth of literature on the estimation of poverty and its decomposition across various regions and sectors of the economy in Pakistan but it is also an unfortunate fact that these poverty estimates not only fail to provide a common ground but also provide different results and at times conflicting ones (Arif, 2006; Cheema, 2005).

Table I presents figures for incidence of poverty for some of the recent studies in Pakistan. These results can be summarized in the following three points. One, while using the same data sets (i.e. HIES/PIHS) no study has covered all time periods since the early 1990's. Two, no two studies arrived at the same poverty estimates. Though in some cases they appear to be close to one another, like, Malik (2004) and Anwar, Quereshi and Ali (2005) reported the incidence of poverty at 38.6% and 38.1% respectively for the period 2001-02. However, the results of

some of the studies covering the same time period are wide apart. For the year 1990-91 Amjad and Kemal (1997) reported the head-count incidence at 22.10% while World Bank (2004) arrived at 34.40% for the same time period with a difference of 12.3%. Third, at times even the same authors using the same data sets for the same time period arrived at different results. For instance, Anwar and Qureshi (2002) arrived at head count incidence of 35.6% for the year 2001-02 while the same authors in 2005 estimated it at 38.1% for the same time period. Similarly, the initial estimates reported by various government publications (based on estimates of Planning Commission/CRPRID) for the year 2001-02 was at 32.10. Cheema (2005) in his critical analysis of the government figures pointed out some loop-holes in the estimation process and arrived at an estimate of 34.46% for the same time period and since then this estimate is reported as official figure for the year 2001-02. Arriving at different results while using the same data sets stems basically from adopting different methodological framework followed by different studies. Potential issues that are associated with different methodologies adopted involve data cleaning, choice of welfare indicator, unit of analysis (individual or household), use of adult equivalent scales, construction of consumption aggregates and updating the poverty line (Cheema 2005).

Based on the recent available Living Standard Measurement Survey (PSLM), official figures show that over all poverty has declined from 34.46% in 2001-02 to 23.9% in 2004-05 (GoP 2006 and UNDP 2007). This substantial decline in poverty is inherent in the methodology followed by government agencies for the recent estimates. On the one hand it did correctly, by keeping the base poverty line fixed and updating it by the inflation rate that has occurred between the two periods i.e. 2001-02 and 2004-05 and by paying heed to one of the main criticism that Pakistan's poverty lines are not consistent and hence not comparable over time (Kakwani 2003). But the real issue is the way the base poverty line is updated. In Pakistan poverty line is updated using the Consumer Price Index (CPI). Though, the use of CPI for calculating the inflation rate and subsequently for updating absolute poverty line is a standard practice in many countries. Its use in case of Pakistan is questionable as its coverage is only limited to the urban areas whereas a vast majority, around two-third, live in rural areas. So the use of CPI for updating the poverty line for 2004-05 seems to have under-estimated the incidence of poverty line (World Bank 2006).

Apart from the various differences cited above regarding poverty estimates in Pakistan, some broad consensus can be drawn from these studies. One, most of the studies has adopted absolute approach for the estimation of poverty line. Two, the minimum threshold level of welfare below which an individual is termed poor, is tied to some nutritional consumption mostly in terms of minimum calories. Three, despite adopting various different methodologies and arriving at different results there seems a consensus that poverty increased in the 1990's upto 2001-02, specially from 1996-97 onwards.

Keeping in view the rising trend in poverty in 1990's, the government of Pakistan intensified its poverty reduction programs under *Poverty Reduction Strategy* launched in 2001. This strategy consists of 5 major sub-heads namely (i) Accelerating economic growth and maintaining macroeconomic stability (ii) Investing in human capital/human development (iii) Augmenting targeted interventions/rural development (iv) Expanding social safety nets and (v) Improving governance. Furthermore, in order to have sustained poverty-related and social sector public sector expenditure, Government of Pakistan promulgated the *Fiscal Responsibility and Debt Limitation Act* in 2005, which requires that such expenditures will not be reduced below 4.5% of the GDP in any given year and budgetary allocations to health and education will be doubled from the existing level in terms of %age of GDP during the next 10 years (GoP 2006).

In this backdrop this paper is an attempt to examine the extent of absolute poverty by drawing a consistent and comparable poverty line. Attempt has also been made to figure out the regional and sectoral concentration of poverty that may serve as an input for policy makers in designing and refining their poverty alleviation agenda.

MATERIALS AND METHODS

The study used the Pakistan Integrated Household Survey (PIHS) data set of 2001-02 and Household Integrated Economic Survey (HIES) part of Pakistan Social and Living Standard Measurement Survey (PSLM) 2004-05. These surveys carry representative samples from all the four federating units of Pakistan i.e. Punjab, Sind, NWFP and Baluchistan on urban-rural basis and provide detailed information on food and non-food consumption items of households.

This study used the official poverty line which is defined as the level of consumption or income that provides enough food to generate 2350 calories per adult equivalent per day (GoP 2002).

Estimation of Poverty Line

Income and consumption stand out to be the two main candidates for measuring welfare. This study took consumption as an indicator of welfare as it works relatively well in the context of developing countries like Pakistan (Ravillion1992 and Cheema 2005). A modified form of Greer and Thoerbeck (1986) method was employed to work out the level of consumption expenditure that provides enough food to generate 2350 calories per adult equivalent per day.

$$\ln Y = a + bX + u \dots\dots\dots(1)$$

Where, Y = Monthly per adult equivalent consumption expenditure (food and nonfood)

X = Daily per adult equivalent calorie intake

“a” and “b” are the parameters to be estimated and $u \sim N(0, \sigma^2)$ is the residual term.

$$Z = e^{(a + bR)} \dots\dots\dots(2)$$

Where “Z” is the absolute poverty line and “R” is the recommended Calories per Adult Equivalent of 2350.

Greer and Theorbeck (1986) method is modified in a sense that they used only the food expenditure regressed against caloric norm where in equation (1) we regressed the total (food plus non-food) expenditure against the caloric norm. This is done with the assumption that along with food which is a basic necessity, households consume some non-food necessities also otherwise they would have increased their caloric intake in the form of increased food consumption.

Prior to estimating equation 1, variations in household size and composition were adjusted for both food consumption and total expenditures by working out per adult equivalent calories consumption and per adult equivalent total expenditure.

Both the surveys were spread over a year time where households faced different set of prices not only over the duration of the surveys but also at different geographical locations within the same survey year. To remove these temporal and geographical differences in prices Paasche Price Index was calculated using median unit values (as a proxy of prices), average budget share in each Primary Sampling Unit (PSU) and median unit values at national level.

$$P_i^P = \left[\sum_{k=1}^n w_{ik} \left(\frac{P_{ik}}{P_{0k}} \right)^{-1} \right]^{-1} \dots\dots\dots (3)$$

Where, w_{ik} is the budget share of item k in the PSU i ;

P_{ik} is the median unit value of item k in the PSU i ;

P_{0k} is the national median unit value of item k .

While calculating the Paasche Price Index median unit values were used instead of mean values as they remain to stay more stable and not prone to extreme values (Deaton and Tarozzi 2000 and Cheema 2005). Additionally, the unit values averaged at such clusters (PSU) are considered to provide good information on price variation (Deaton and Zaidi 2002).

After adjusting the household consumption expenditure by its size and composition; and prices they face, the regression is run for the first three quintiles. This is done to avoid the consumption behavior of the richest segments of the society and the risk of over estimation of the poverty line.

Updating the Poverty Line

The basic logic behind using absolute poverty approach in the context of developing countries is that any progress (or otherwise) can be measured against a fixed target. For the poverty line to remain fixed over time requires that once estimated it should only be changed/ updated by changes in prices. Adjusting the poverty line for inflation only gives estimates that are comparable over time (Ravillion and Badani 1994; Kakwani 2003, World Bank 2005 and Cheema 2005).

For the recent survey period (PSLM 2004-05), we updated the base poverty line (PIHS 2001-02) by an inflation rate based on Tornqvist Price Index (TPI) (Eberle and Chishti, 2008). The logic behind preferring TPI over CPI are (i) that being a survey based index TPI takes into account the price changes from both the urban and rural areas whereas CPI is restricted to urban areas only. (ii) TPI incorporates the substitution effect because of changes in prices over time whereas CPI uses fixed weights of the base year that is unable to capture such effect. (iii) The weight assigned to a commodity by the TPI is household survey based whereas in case of CPI such weights come from price and quantity information from market surveys conducted by Federal Bureau of Statistics.

$$TPI = I_{Tt} = \prod_i \left(\frac{p_{i1}}{p_{i0}} \right)^{s_i} \dots\dots\dots (4)$$

Where, p_{i1} is the median unit value (price) of commodity i in period 1 (PSLM 2004-05),
 p_{i0} is the median unit value of commodity i in period 0 (PIHS 2001-02),
 $s_i = 0.5(e_{i0}/\sum e_{i0} + e_{i1}/\sum e_{i1})$ is the mean expenditure share of item i in the two surveys with $e_{i0}/\sum e_{i0}$ and $e_{i1}/\sum e_{i1}$ representing the expenditure share of item i in total expenditure in the base survey period (2001-02) and recent survey period (2004-05).

Poverty Measures: The Choice of Aggregator

After estimation of the poverty line we followed the widely used poverty measures proposed by Foster, Greer and Thoebeck (1984).

$$P_\alpha = \frac{1}{n} \sum_{i=1}^q [(Z - y_i) / Z]^\alpha \dots (5)$$

Where, Z is the poverty line and y_i is per adult equivalent expenditure of household i .

If $\alpha = 0$, the index captures the Head-Count ratio which is the number of poor as a %age of the whole population. If $\alpha = 1$, then P_α captures the poverty gap which is an estimate of the average shortfall of the consumption expenditure of the poor expressed as a share of the poverty line. For $\alpha = 2$, P_α give a measure of severity of poverty by giving more weight to the poorest of the poor. It corresponds to the squared average distance of the consumption expenditure of the poor to the poverty line.

Concentration Index

Given information on the incidence of poverty and poverty line, the study also attempted to compare the contribution to poverty and its concentration by/across regions, provinces and sectors of the economy. Concentration Index was estimated as:

$$CI_i = Pi / Pop_i * 100 \dots\dots\dots(6)$$

Whereas, CI_i is the concentration index of region/province/sector i ,
 Pi is the % contribution of region/province/sector i to the overall poverty and
 Pop_i is the % population share of region/province/sector i in the overall population.

A value of $Ci = 1$, suggests that sector/province/region i contributes equally to the poverty in relation to its size of population. Similarly, a value of $Ci < 1$, suggests that sector/province/region i contributes less to the poverty in relation to its size of population and in case of a value of $Ci > 1$, suggests that sector/province/region i contributes more to the poverty in relation to its size of population.

RESULTS AND DISCUSSION

Based on the methodology followed, we estimated the poverty line at Rs 730.10 per adult equivalent per month for 2001-02. This base poverty line was updated by an inflation rate of 28.37 % that occurred between PIHS 2001-02 and PSLM 2004-05 survey periods to arrive at a poverty line of Rs 937.45 per adult equivalent per month for 2004-05. Table II shows that head count index (incidence of poverty) decreased by 5.74 % between the two survey periods i.e. from 35.44 % in 2001-02 to 29.70 % in 2004-05. In absolute count the number of poor decreased from 44.34 million in 2001-02 to 38.57 million in 2004-05. Absolute poverty decreased by 5.67 % and 4.48 % in rural and urban areas respectively between the surveys periods. However, in relative terms urban poverty fell by 23.48 % and rural poverty by 16.37 %. The fall in incidence of poverty is much less compared to ones provided by the government sources which show a decrease in incidence of poverty by 10.52 % between 2001-02 and 2004-05. The difference in the estimate lie in the methodology followed, mainly, for updating the base poverty line (The official poverty line was arrived at Rs 878.64 for 2004-05 by updating the base poverty line with a CPI based inflation rate of 21.45 % (GoP, Economic Survey of Pakistan 2006, 54p.).

The poverty gap figures at the national level shows that averaged over the whole population, the poor's consumption shortfall is equivalent to 7.30 % of the value of the poverty line in 2001-02 and like the head count index, it decreased to 6.17 % of the value of poverty line in 2004-05. In relative terms the rural poverty gap fell by 14.68 % while for urban areas it showed a decline of 25.46 % between the two surveys.

The severity of poverty measure, a distributionally sensitive measure which in other words is a squared poverty gap index shows that at the national level, the measure decreased from 2.23 to 1.96 between the survey periods. In relative terms the severity of poverty fell by 9.40 % and 23.47 % for rural and urban areas respectively between 2001-02 and 2004-05. The concentration index, defined as the ratio of the %age contribution to the overall poverty of region/province/sector *i* to its share of population in the overall population, is given in Table III and IV. The concentration index (Table III) shows that region wise rural areas contribute 14 % more to the overall poverty relative to its size of population in 2001-02 while in 2004-05, though the overall poverty declined, it contribute 17 % more to the overall poverty relative to its size of population. Province wise NWFP stand out to the poorest province followed by Baluchistan. NWFP contributed 21 % more to national poverty relative to its size of population in 2001-02 and for 2004-05 this figure increased to 33 %. The largest decrease in concentration index is shown by Sind where it dropped from 1.03 in 2001-02 to 0.77 in 2004-05 suggesting that Sind contributes 23 % less to overall poverty in relation to its population in 2004-05.

Table IV shows that industry/sector wise, the concentration index for agriculture and construction is more than 1, in both 2001-02 and 2004-05, suggesting the concentration of poverty in these sectors compared to other sectors. The concentration index for the construction sector stands out to be the highest in both the surveys followed by the agriculture sector, the sector with the largest population share. The population share of agriculture sector is almost two-fifth of the whole population while for construction it is less than one-tenth in both the surveys. The ranking of all the nine sectors did not show any dramatic change over the survey years.

Table I. Trend in absolute poverty in Pakistan (Head-count ratio)

Source	1990-91	1992-93	1993-94	1996-97	1998-99	2001-02	2004-05
GoP	-	24.9	27.7	24.5	30.6	32.10	23.9
Amjad and Kemal (1997)	22.10	22.40	-	-	-	-	-
MHDC (1999)	26.10	26.80	28.70	-	-	-	-
Jamal and Pasha (2000)	-	-	-	31.0	-	-	-
Qureshi and Arif (2001)	-	-	-	-	35.2	-	-
Anwar and Qureshi (2002)	-	17.2	-	-	30.4	35.6	-
DFID (2004)	-	24.97	27.72	24.54	30.63	33.95	-
World Bank (2004)	34.40	-	28.60	-	32.6	37.30	-
Malik (2004)	-	-	-	-	-	38.6	-
Anwar, Qureshi and Ali (2005)	-	-	-	-	-	38.1	-
Cheema (2005)	-	25.46	28.17	25.78	31.08	34.46	-

GoP: Government of Pakistan (Planning Commission)

MHDC: Mehboobul Haq Center for Human Development

DFID: UK Department of International Development

Table II. Comparison of poverty estimates (PIHS 2001-02 and PSLM 2004-05)

Region	Poverty Estimates					
	Head Count		Poverty Gap		Severity of Poverty	
	2001-02	2004-05	2001-02	2004-05	2001-02	2004-05
Urban	23.56	19.08	4.73	3.77	1.42	1.15
Rural	40.29	34.62	8.35	7.28	2.56	2.34
Total	35.44	29.70	7.30	6.17	2.23	1.96

Table III. Contribution to overall poverty by region and provinces

Region/ Province	Contribution to Poverty		Population Share		Concentration Index	
	2001-02	2004-05	2001-02	2004-05	2001-02	2004-05
Region						
Urban	19.25	20.40	28.95	31.73	0.66	0.64
Rural	80.75	79.60	71.05	68.27	1.14	1.17
Provinces						
Punjab	52.30	57.10	56.10	56.32	0.93	1.01
Sind	26.27	19.40	25.52	25.32	1.03	0.77
NWFP	16.84	18.40	14.00	13.83	1.21	1.33
Baluchistan	4.60	5.10	4.42	4.47	1.04	1.14

Table IV. Contribution to overall poverty by sectors

Sectors	Contribution to Poverty		Population Share		Concentration Index	
	2001-02	2004-05	2001-02	2004-05	2001-02	2004-05
Agriculture and livestock	44.39	40.24	40.44	37.18	1.10	1.08
Mining and manufacturing	8.11	7.89	8.63	8.07	0.94	0.98
Electricity, water and gas	0.79	0.49	1.22	0.88	0.65	0.56
Construction	13.19	10.27	8.35	7.18	1.58	1.43
Wholesale, retail and restaurant	11.46	13.27	14.41	16.76	0.80	0.79
Transport and communication	6.46	5.37	6.58	5.44	0.98	0.98
Finance, insurance and real estate	0.18	0.15	0.76	0.54	0.23	0.27
Community and personal services	13.87	18.07	17.24	19.37	0.80	0.93
Not adequately defined	1.56	4.25	2.38	4.69	0.66	0.90

CONCLUSION

The incidence of absolute poverty in Pakistan for PSLM 2004-05 as provided by the government is a bit under estimated. While inflating the base poverty line by TPI, a survey based index, the results showed that the decrease in incidence of poverty is almost half as reported in official documents. The low values of the poverty gap and severity of poverty suggest clustering of poor around the poverty line and any minor shock to the economy can have a profound effect on the incidence of poverty. Poverty measures and concentration index suggest that poverty is mainly a rural issue in Pakistan. The concentration index for NWFP and Baluchistan; and construction and agriculture imply that these provinces and sectors contribute more to national poverty relative to their size of population. The findings suggest that region-wise rural areas, province-wise NWFP and Baluchistan and sector-wise construction and agriculture industry need preferential focus in any poverty alleviation policy drive.

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