

Acute Multidimensional Poverty: A New Index for Punjab

Shaista Ashraf, Muhammad Usman

Abstract— The paper presents a new measure Multidimensional Poverty Index (MPI) for the province of Punjab. The measure was proposed by Alkire and Foster (2007, 2009) for 104 developing countries. In this paper, MPI is estimated by SPSS and MS-Excel using Multiple Indicator Cluster Survey 2007-08 (MICS) data set for the population of Punjab. It integrated many aspects of poverty related to the MDGs into a single measure. MPI also examines the most common deprivations related to different districts of Punjab. On the evidence of this MPI Rankings we divide these indices in three bands i-e low poverty, medium and extreme poverty. Individually the performances of each district with respect to each dimension may not depict such trends as was shown on the. The significant variations in each dimension of MPI can occur according to chronological changes. In supplementary investigations on the best equivalent asset measures that could be assembled from several datasets would have been useful in the future outlook.

Index Terms— A (Average Intensity of Deprivation), BCG (Bacillus-Census-Geurin), GDP (Gross Domestic Product), H (Headcount Ratio), HDI (Human Development Index), MDGs (Millennium Development Goals), OPHI (Oxford Poverty & Human Development Initiative).UNDP (United Nation Development Program)

1 INTRODUCTION

Poverty is conventionally measured by income. And yet the poor are poor not just because of low income because they have no access to health care, to education and good nutrition. Income has been used for some times now as a proxy for poverty although not a sufficient proxy. Oxford Poverty & Human Development Initiative (OPHI) has now developed a simple, robust, user friendly multidimensional approach i-e "Multidimensional Poverty Index (MPI)" to measure poverty. It has been published by OPHI and the United Nation Development Program (UNDP) Index created using a technique developed by Sabina Alkire and James Foster. The Alkire Foster method measures outcomes at the individual level (person or household) against multiple dimensions. This method is flexible and can be used with different societies and situations. It aims to give a multidimensional portray of people living in poverty. It measures the poverty at the individual level in education, health & standard of living. The MPI is featured in the 20th Anniversary edition of the UNDP Human Development Report 2010.

MPI is an index of acute multidimensional poverty. It reflects deprivations in very elementary services and interior human functioning for people. It reveals the amalgamation of deprivations that focus a household at the same time. The MPI can be used to develop clear picture of individuals living in poverty, across countries, and within countries by ethnic group, urban/ rural location and other measure of its aspect

like union council wise and region wise or other key household characteristics. It offers necessary compliment to income poverty measures because it measures deprivations directly. It helps us to identify deprived and most vulnerable people and shows the interconnections among deprivations. The brief summary key finding of the new measure can be used by governments, development agencies, and other institutions to help eradicate acute poverty. The MPI uses 15 indicators to measure three critical dimensions of poverty at the household level: Education, Health & Living Standard in Punjab. Deprived family units are recognized and combined evaluation rose up with the method planned by Alkire and Foster (2007, 2009). All dimensions are evenly weighted; every indicator contained by dimension is also evenly weighted. Whereas Sabina Alkire had been used ten indicators to build up the Multidimensional Poverty Index (MPI) developed for 104 countries. MPI divulges a different prototype of deficiency than income poverty, as it lights up a unlike set of deficiencies. A person who is deprived in 70% of the indicators is clearly inferior to someone who is deprived in 40% of the indicators. The family unit is acknowledged as multidimensional deprived if, and only if, it is underprivileged in a number of grouping of indicators whose weighted sum exceeds 30 percent (30% taking by 1/3 of the Punjab population) of deprivations. The dimensions and indicators are presented below and explained with detail in the following:

1. Health (every indicator weighted evenly at 1/9)

- Child Mortality: If any child has died in the family
- Nutrition: If any adult and child in the household are malnourished.
- BCG-Vaccination: if child has'nt been BCG vaccinated

2. Education (every indicator weighted evenly at 1/6)

- Year of schooling: If no household member has completed 5 years of schooling

- **Shaista Ashraf** has completed her M. Phil in Statistics from Government College University, Lahore. She is currently working as Statistical Officer in Bureau of Statistics, Planning & Development Department, Government of the Punjab. Cell: +92(323)5095390. E-mail: shaigcul@gmail.com
- **Muhammad Usman** has completed his M. Phil in Statistics from Government College University, Lahore. He is currently working as Statistical Officer in Bureau of Statistics, Planning & Development Department, Government of the Punjab. Cell: +92(345)7737290. E-mail: usmann75@hotmail.com

- Child Enrolment: If any school-aged child is out of school in years 1 to 8
- 3. Standard of Living (each of the 11 indicators weighted equally at 1/11)**
- Electricity: No electricity is poor
 - Drinking Water: The household does not have access to clean drinking water according to MDG
 - Sanitation/ Toilet Facility: The household sanitation facility is not improved according to MDG
 - Sharing Toilet: If the household members sharing the toilet with the other households even this facility is improved
 - Disposal of Waste-water: The household does not have improved facility to dispose of waste water
 - Disposal of Solid-Waste: The household does not have the improved facility to dispose of solid waste
 - Flooring-Material: Dirt or Katcha / sand or dung are poor
 - Roofing-Material: No roof/ Thatch or palm leaf/ Rustic mat/ Bamboo/ Kanne are poor
 - Wall-Material: No walls / straw/ bamboo with mud/ stone with mud/ unbaked bricks with mud/ plywood/ carton/ reused wood are poor
 - Cooking Fuel: Straw / shrubs/ grass/ animal dung/ agriculture crop residue are poor
 - Assets: If don't own more than one of : Radio, television, telephone, bicycle, motorbike and animal drawn cart

1.1 MPI AND MDGs

Millennium Developments Goals (MDGs) are the most generally supported, comprehensive and specific development goals the world has ever settled upon. On the other hand, the global MDG reports customarily current advancement on every indicator individually. But no MDG index formation has yet been made, only some connectivity and correlation figures were found in this aspect.

Multidimensional Poverty Index is calculated by multiplying two factors: the Headcount $H \rightarrow$ proportion of people who are multidimensionally deprived in selected weighted indicators, and the Average Intensity of deprivation $A \rightarrow$ which reflects the proportion of dimensions in which households are deprived. Alkire and Foster have proved this measure is very smooth to compute in addition to understand thus extreme robust moreover assured many desirable belongings.

1.2 OBJECTIVES

The objectives of the study are:

- Integrating many different aspects of poverty in Punjab related to the MDG's into a single measure
- Examining which deprivations are most common among different districts
- Rank the districts of Punjab according to MPI

TABLE 1
CUTOFFS FOR EACH INDICATOR AND MDG'S

Dimension	Indicator	Related to	Relative weight
Education	Year of schooling	MDG2	1/6 of 15
	Child enrolment	MDG2	1/6 of 15
Health	Child Mortality	MDG4	1/9 of 15
	Nutrition	MDG1	1/9 of 15
	BCG		1/9 of 15
Standard of Living	Electricity		1/11 of 15
	Sanitation	MDG7	1/11 of 15
	Disposal of waste water	MDG7	
	Disposal of solid waste	MDG7	
	Sharing Toilet	MDG7	
	Drinking Water	MDG7	1/11 of 15
	Household structure (Floor, Wall, Roof)		1/11 of 15
	Cooking Fuel	MDG7	1/11 of 15
	Assets	MDG7	1/11 of 15

2 REVIEW OF LITERATURE

The review of literature has been compiled keeping in view the basic dimensions of the topic of the study. What theory is apposite for scrutinize poverty dynamics? As Duncan (1984) note, a complete account of why people are underprivileged would requisite many consistent theories-theories of family units, earnings, assets accrual, and transfer programs, to name only some. In the past studies on poverty in developing country like Pakistan have usually based on absolute concept in 90's after that Zaidi and Vos (1993) analyzed the case for using relative poverty threshold. It has been compared the size and composition of poor people using relative poverty lines. To compare the multiple sizes of households and structures, equivalence scales has been used.

There are other aspects of poverty which relates to women rights in equality in our society. Whenever we talk about poverty income disparities always comes into our mind. But there are some other facts which are significantly related to poverty such problems like women health etc if considered seriously then in some way poverty reduction might be possible. In the 1995, such problems have been highlighted. Human Development, if not engendered, is endangered. That is the simple but far-reaching message of Human Development Report (1995). The Report analyses the development made in

reducing gender disparities in the past few decades, enlightening the wide and consistent gap between women's expanding capabilities and limited opportunities. In the beginning of 2002, it has been talking the issues of poverty inequality, inadequate education, and generally low health and welfare standards. It presents the poverty in to two main type's income poverty and non-income and seeing how poverty plays a role in people's life.

The innovative century opened with an exceptional assertion of commonality and fortitude to do away the world from poverty. The methodological choices come upon in the construction of composite indices of economic and social welfare in 2003. In current years a bulk of composite indexes of economic and social welfare has been developed. Unluckily the methodological concerns related with index construction have often been ignored or inefficiently treated by index developers. Jamal, *et al* (2003) uses the index of Multiple Deprivation (IMD) to show the deprivations for the period of 2003-04. This paper focuses the poverty alleviation in developing countries specially Pakistan. Ecological objectives may be a practicable way to deal out income for poverty improvement in developing countries. The Case of Urban and Rural Pakistan, Jamal (2005) provides association of household consumption or poverty using the latest household survey. Another imperative apprehension regarding the HDI is its weighting method. Each measurement of development is given an equal one-third weight which is continuously query by literature. Ghaus (1996) and Noorbakhsh (1998) have provided other ways of assigning weights and calculating ranks such as the Principal Component Analysis (PCA) technique and Borda method. Finally, many query the true importance of the HDI and whether more than one aspect is required for the measurement of social wellbeing as compared to a standalone GDP per capita evaluation. Despite the consequences of these concerns, the HDI is continuously referred to and is applauded for its ease in comparability and reckoning across countries. Ali (2006) compared the social paradigm of Pakistan with other societies. It represents the major tramp ahead in the devolution of the condition of fundamental services downward to the local level in Pakistan. It focuses on the subject of poverty, identify its nature, extent and profile, and highlighting the structural dimensions of poverty, depth analysis of the state of education in Pakistan, problems of social underdevelopment and inequality and poverty. The cross sectional data together from time to time had been used to analyze and model the determinants of poverty but no attempt had been made to analyze it on the provincial level in Pakistan. Sikander and Ahmed (2008) had used Logistic regression Analysis of MICS 2003-04 for identifying the household determinants of poverty in Punjab. This paper endeavors to model a variety of demographic and socio-economic determinants of poverty. ADB (2008) has discussed the issues, causes and institutional res-

ponses of poverty in Pakistan. Khan (2009) endeavors to evaluate the status of education in existing districts of Punjab and compares the status of education attainment in 1998. The tool used for measurement and comparison is the calculation of the Education Index (EI) for the districts of Punjab. The Education Index is a composite index which is premeditated using enrollment at different education levels and literacy rates. Jamal (2011) presents the income poverty results ignore multi-dimensional aspects or deprivations of household well-being. Therefore, deprivation indices which are base on non-income characteristics of households are preferable measures of household well-being. These indices of multiple deprivations are intended to evaluate the poorest or socially excluded sector of the society. UNDP and Oxford University (2010) has launched a new index to measure poverty level which they said give a "Multidimensional" picture of people living in hardship, and could help taught development resources more effectively. Alkire and Santos (2010) presented paper on this new Multidimensional Poverty index (MPI) for 104 developing countries.

The above literature review shows that many studies were carried out in the past to assess the scope of poverty in Pakistan at the micro and sectoral level but very little studies have put emphasis on its fundamentals at the comprehensive level. As poverty is a sign of many disorders in the configuration of nation so it is an effect of many causes normally present in a country. This study will narrates the major areas of Punjab which are in fact deprived in multidimensional sectors and where actually need of improvement to combat the multiple deprivations.

3 DATA AND METHODOLOGY

Since the objective of this study is to explore the impact of poverty in all districts of Punjab, therefore we need an index that explores both long run and short run dynamics between the districts, divisions and regions of Punjab. In this connection, we use the Alkire Foster Method.

3.1 UNIVERSE AND UNIT OF ANALYSIS

The sample space constitutes of all family units and their individuals in all urban and rural areas of Punjab as defined for the 1998 Census of Population and Housing (CPH) and subsequent changes made by the provincial government. The province of the Punjab is administratively divided into 9 divisions, 36 districts and 143 tehsils / domains. The MPI has fifteen indicators: three for health and two for education, and eleven for living standard. Perfectly, the MPI would have used the individual as a unit of analysis, which is likely to do with the AF (Alkire & Foster) measurement methodology. Such an analysis would have permitted us to measure up to across gender and age groups, and to document intra-household disparities. The only indicators for which individual level data

are available for all household members are years of education and the living standard variables which naturally apply to all household members. Therefore the MPI exercises the household as a unit of analysis.

3.2 SAMPLE DESIGN

The sample has been selected in two stages. In urban areas, the first-stage selection unit is the Enumeration Block. In the rural areas, the first-stage selection unit is the village. From each first-stage sample unit, a sample of households has been selected: 16 in the rural areas and 12 in the urban areas. The second stage units are selected with probability proportional to size. The second stage units are selected with equal probability. This gives a sample that is more or less self-weighting within each selection stratum.

3.3 WEIGHTS OF INDICATORS

According to Alkire Foster Method, "Weights can be practically applied in three ways in multidimensional poverty measures: (i) between dimensions (the relative weight of health and education), (ii) within dimensions (if more than one indicator is used), and (iii) among people in the distribution

3.4 CALCULATION OF THE INDEX

The MPI is calculated as: $MPI = H \times A$

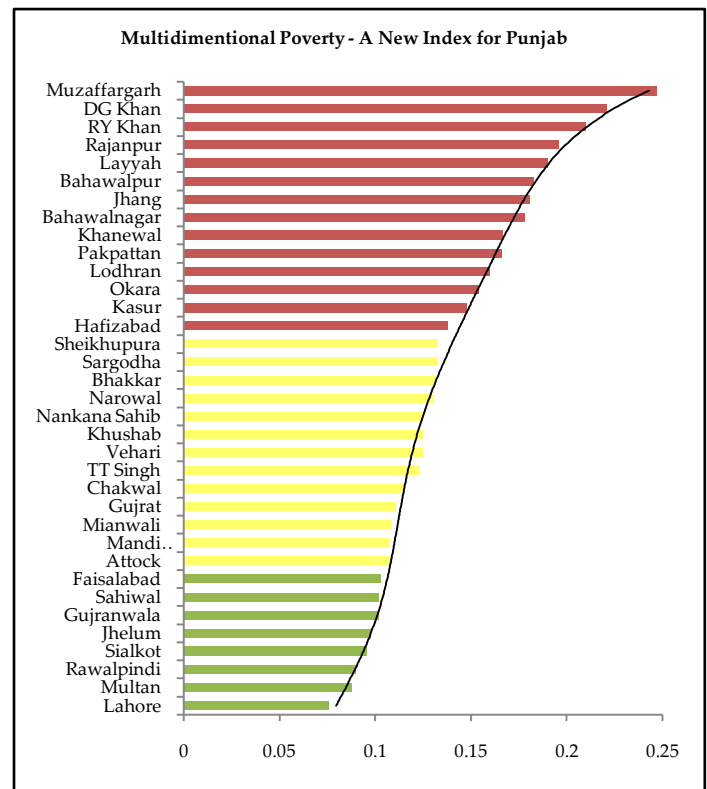
The MPI is the product of two numbers: the Headcount H or percentage of people who are poor, and the Average Intensity of deprivation A- which reflects the proportion of dimensions in which households are underprivileged. Alkire and Foster illustrate, this measure is very simple to estimate and understand, sensitive even though strong, and assures many enviable properties.

4 RESULTS AND DISCUSSIONS

Figure-1 portrays the predictable level of deprivation for the year 2007-08. In this Figure, MPI conspire the comparative levels of deprivations and magnitudes of variations in each district. Highest decline in the deprivation is observed in districts Lahore, Multan, Rawalpindi, Sialkot, Jhelum, Gujranwala, Sahiwal and Faisalabad. The ranking in terms of MPI in districts is significantly varied. It can be observed from the behavior of the graph Muzaffargarh, D.G.Khan, Rajanpur, R.Y.Khan, Layyah, Bahawalpur, Jhang, Bahawalnagar, Khanewal, Pakpattan, and Lodhran are much deprived in lower Punjab districts. These districts MPI approximately in each sector remained the same as evident from Figure 5.1. The rest of districts are moderately behaving. So on the evidence of this MPI Rankings we divide these indices in three bands i-e low poverty, medium and extreme poverty. The less Multidimensional deprived districts are: Lahore, Multan, Rawalpindi, Sialkot, Jhelum, Gujranwala, Sahiwal and Faisalabad are included.

These districts are at the beneath level of deprivation. In other words, deprivations exist in these districts in all dimensions but these districts are relatively less deprived than others.

FIGURE 1
SEQUENTIAL MULTIDIMENSIONAL INDICES AT DISTRICT LEVEL
(MICS PUNJAB, 2007-08)



Individually the performances of each district w.r.t. each dimension may not be depict such trend as on the average it showing. The significant variations in each dimension of MPI can be occurred according to chronological changes. After that the districts with moderate multidimensional deprivations according to MPI are: Attock, Mandi-Bahauddin, Mianwali, Gujrat, Chakwal, T.T. Singh, Vehari, Khushab, Nankana Sahib, Narowal, Bhakkar, Sargodha and Sheikhupura. The districts Hafizabad, Kasur, Okara, Lodhran, Pakpattan, Khanewal, Bahwalnagar, Jhang, Bahawalpur, Layyah, Rajanpur, R.Y.Khan, D.G.Khan and Muzaffargarh are the most deprived in all dimensions. Classifying the districts in terms of low, medium and high discrepancies on the basis of one-third provincial population in each of the categories provides a useful basis of analysis. High deprivations refer to the one-third population residing in the highest deprived area.

5 FURTHER RECOMMENDATIONS

There are more than few arguments in support of the selected dimensions viz Health, Education and Living Standard. The motivations are superior to liberate the first report of the

MPI with these three dimensions. At the same time, for the reason that data are a requisite constraint, the main concern for future work on multidimensional poverty must be assembling more and enhanced data around core areas such as unofficial work, empowerment, safety from hostility, and mutually individual associations (public resources and esteem vs. disgrace, harassment). This will facilitate experimental investigations of whether such dimensions affix significance to a multidimensional poverty evaluation. There is not only the dimensions can be added, moreover, indicators can also be added up for the further investigations. In subsequent work, it can be accessible the breakdowns and associations of poverty and household size to investigate dynamically any probable partiality. These indicators which are already included in three dimensions can also be scrutinizing by applying the Factor Analysis, Principal Component Technique (PCA).

In supplementary investigations on the best equivalent asset measures that can be assembled from several datasets would be useful in the future outlook.

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