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Measuring Multidimensional Parameters of Poverty Using Alkire and Foster Methodology in Qasimabad: A Case Study

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Abstract
This paper measures the multidimensional poverty using Alkire and Foster methodology for ten regions of Qasimabad on the primary data. No one indicator alone gives us clear picture of poverty as poverty is multidimensional in nature. We have taken three dimensions having equal weights, education, health and living standard. These dimensions are further divided in ten indicators, two for each, education and health, and six for living standards. Results suggest that region Gul Baig Chandio has the highest multidimensional poverty whereas Muslim Society has the lowest multidimensional poverty among the selected regions of Qasimabad. Results further suggest that the indicators which contribute more to multidimensional poverty are life expectancy, year of schooling, Assets, Improved sanitation, child mortality, flooring and child school attendance. Analyzing the data we came to know that the Percentage of people who are MPI poor in Qasimabad is 45(Incidence of poverty), whereas their average deprivations are 43.27% .Furthermore, Multidimensional poverty Index (MPI) is 19.47% in Qasimabad.
Keywords: Multidimensional poverty, incidence of poverty, Average deprivation

1. INTRODUCTION

Poverty is multidimensional in nature no one indicator alone constitute poverty. Poverty cannot be measured by income alone rather poor people consider their deprivation more broadly. Multiple deprivations are faced by poor such as poor health, malnutrition, access to clean water and year of schooling. To develop clear picture of poverty, we need to build multidimensional poverty approach. Multidimensional poverty gives us clear picture of poverty such as who is poor and how they are poor. Poverty varies in different societies and different indicators should be taken to overcome poverty. For example, an area where many peoples are deprived in education requires policies such as focusing on education. On the contrary, an area where many people are deprived in health facility requires policies to overcome health issues.

2. METHODOLOGY

We have selected Qasimabad as a population (Step 1) and five randomly selected wards as a sample size (Step 2). Each ward has been divided in two regions (Step 3). Sample size of 380 was chosen with the help of Krejcie and Morgan table (Step 1). These 380 Questionnaires were filled through selected regions for developing multidimensional poverty index (Step 4). Multidimensional poverty index was created with the help of Alkire and Foster methodology.

Step1: Selection of sample size

Population	Average number of members in house	Number of house hold	Sample Size
304899	6.7	304899/6.7≈45705	381-1=380

Step 2: Number of household from each ward

Number of wards	Selected random wards	Household from each ward
27	5	380/5=76

Step 3: Random selected wards and their regions.

Ward 15	Ward 16	Ward 17	Ward 18	Ward 19
Anwar Vilas	Giddu Nakka	Pathan Goth	Gulshane Mehran	Sehrish Nagar
Juneja Colony	Mir Fateh Colony	Gul Baig Chandio	Memon Society	Shedi Godh

Step 4: Deprivation cut off for collecting primary data.

Dimensions of Poverty	Indicator	Deprived if…	Weight
Education	Years of Schooling	Any household member has no completed five years of schooling	1/6
	Child School Attendance	Any School-aged child is not attending school up to class 8	1/6
Health	Child Mortality	Any child has died in the family	1/6
	Life Expectancy	Average life is below the expected life in the world	1/6
Living Standard	Electricity	The household has no electricity	1/18
	Improved Sanitation	The household sanitation facility is shared	1/18
	Improved Drinking Water	The household does not have access to safe drinking water or safe water is more than a 30 minute walk from home	1/18
	Flooring	The household has a dirt, sand or dung floor	1/18
	Cooking Fuel	The household does not cook with natural gas	1/18
	Assets Ownership	The household does not own group of small assets such as radio , television, bike, refrigerator and does not have car	1/18

Mathematical Formulae:

Step 1: Creation of deprivation matrix through primary data.

Each row represents each man and each column represents each indicator in deprivation matrix.

$$\begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1m} \\ a_{21} & a_{22} & \cdots & a_{2m} \\ \vdots & \vdots & \vdots & \vdots \\ a_{n1} & a_{n2} & \cdots & a_{nm} \end{bmatrix}$$

Step 2: Score vector and censored deprivation matrix

Score vector represents the score of each man which is basically the sum of entire row for each man. Multidimensional poverty dual cut off is set at $k = \frac{1}{3}$ in order to develop censored deprivation matrix.

Step 3: Headcount ratio

$$H = \frac{q}{n}$$

Where "H denotes the Incidence of people whose share of weighted deprivation is k or more" and whole population is denoted by n whereas people who are multidimensional poor is denoted by q.

Step 4: Average Deprivation

People who are multidimensional poor their average deprivation can be obtained by the formula written below.

$$A = \sum_{i=1}^{n} \frac{d_i(k)}{q}$$

Where $d_i(k)$ is the censored deprivation of individual i and q is the number of people who are multidimensional poor.

Step 5: Evaluating the MPI (Grand Total):

$$MPI = H \times A$$

H: Incidence of poverty

A: Average deprivation of poor people

Step 6: Formula to compute MPI's of each indicator:

Each indicator's contribution to $MPI = \frac{We_n CH_n}{MPI_{Qasimabad}} \times 100$

Where We_n is the weight attach to indicator n .Where CH_n is the censored deprivation score vector of indicator n.

3. RESULTS AND DISCUSSIONS

(Fig-1) shows that incidence of poverty and intensity of poor people is highest in region of Gul Baig Chandio and lowest in Memon Society. Not only ward 17 has highest incidence of poverty but also intensity of poor people **(Table-1).** Ward 18 has the lowest percentage of poor people whereas ward 19 has the lowest intensity of poor people **(Table-1)**. **(Fig-1)** further suggests that MPI is lowest in Memon Society and Highest in region of Gul Baig Chandio. Highest MPI among the selected ward is in 17 and lowest in 18 **(Table-1)**. Sehrish Nagar has the second highest percentage of poor people whereas Mir Fateh Colony has the second highest average deprivation faced by poor people **(Fig-1). (Table-2)** indicates that highest contribution to the MPI in Qasimabad is shared by the indicator life expectancy and lowest contribution to the MPI in Qasimabad is shared by the indicator improved drinking water. Contribution of each indicator to the MPI varies in each region.

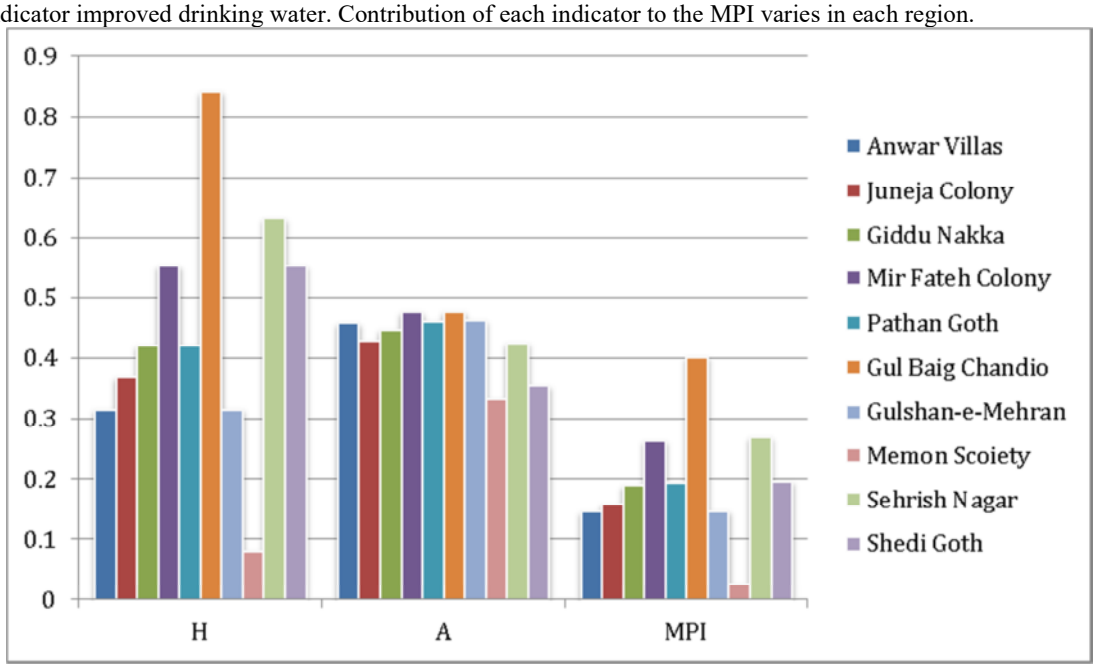

Fig. 1: Incidence of poverty, Average deprivation of poor people & MPI

	Anwar Villas	Juneja Colony	Giddu Nakka	Mir Fateh Colony	Pathan Goth	Gul Baig Chandio	Gulshan-e-Mehran	Memon Society	Sehrish Nagar	Shedi Goth
H Regions	0.3158	0.3684	0.4211	0.5526	0.4211	0.8421	0.3158	0.0789	0.6316	0.5526
H Wards	Ward15=0.3421		Ward16=0.4868		Ward17=0.6316		Ward18=0.1974		Ward19=0.5921	
H Overall	**0.45**									
A Regions	0.4583	0.4286	0.4479	0.4762	0.4618	0.4774	0.463	0.3333	0.4259	0.3545
A Wards	Ward15=0.4434		Ward16=0.4620		Ward17=0.4696		Ward18=0.3982		Ward19=0.3902	
A Overall	**0.4327**									
MPI Regions	0.1447	0.1579	0.1886	0.2632	0.1945	0.402	0.1462	0.0263	0.269	0.1959
MPI Wards	Ward15=0.1517		Ward16=0.2249		Ward17=0.2966		Ward18=0.0786		Ward19=0.2310	
MPI Overall	**0.1947**									

Table 1: Incidence of poverty, Average deprivation of poor people & MPI

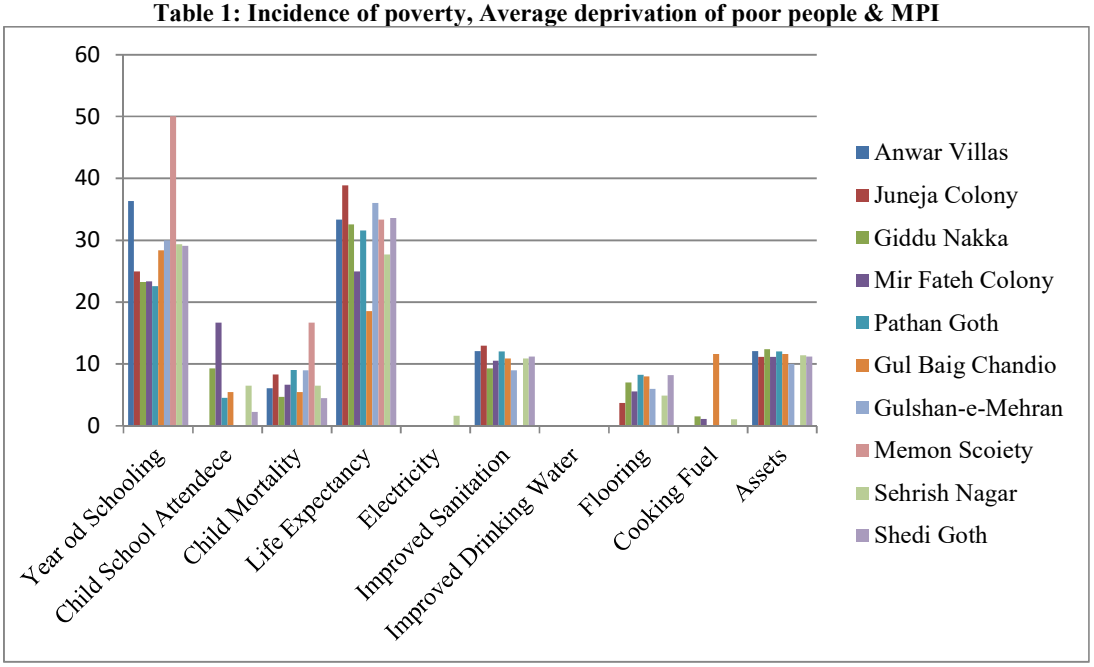

Fig. 2: Contribution of each indicator to MPI

Table 2: Contribution of each indicator to MPI

	Anwar Villas	Juneja Colony	Giddu Nakka	Mir Fateh Colony	Pathan Goth	Gul Baig Chandio	Gulshan-e-Mehran	Memon Society	Sehrish Nagar	Shedi Goth
Year of Schooling	36.3636	25	23.2563	23.333	22.5568	28.3634	30.0006	50	29.3478	29.1049
Child School Attendance	0	0	9.3028	16.667	4.5108	5.4543	0	0	6.5221	2.2393
Child Mortality	6.06	8.3333	4.6507	6.667	9.023	5.4543	9	16.67	6.5221	4.4772
Life Expectancy	33.3327	38.8883	32.5577	25	31.5785	18.5452	36	33.33	27.7171	33.5821
Electricity	0	0	0	0	0	0	0	0	1.6308	0
Improved Sanitation	12.1218	12.9633	9.3028	10.556	12.0302	10.9093	9	0	10.8695	11.1936
Water	0	0	0	0	0	0	0	0	0	0
Flooring	0	3.7033	6.9767	5.556	8.2705	7.9999	5.9994	0	4.8913	8.2088
Cooking Fuel	0	0	1.5502	1.111	0	11.6365	0	0	1.0868	0
Assets	12.1218	11.1117	12.4033	11.111	12.0302	11.6365	10.0008	0	11.4134	11.1936
Total	100	100	100	100	100	100	100	100	100	100

4. CONCLUSION

The long and short of the matter is that multidimensional poverty in Qasimabad is 19.47%, whereas the percentage of people who are poor is 45 and their intensity level is 43.27%.Most of the people in Qasimabad are deprived in the indicator of life expectancy whereas this indicator is not contributing most among the every selected regions of Qasimabad .For example, most of the people of Anwar Villas are deprived in indicator year of schooling whereas year of school is contributing less in Pathan Goth. Similarly, most of the people of Juneja Colony are deprived in the indicator life expectancy whereas less people in this indicator are deprived in Gul Baig Chandio. Therefore, there is a dire need of improvement in the indicator life expectancy and year of schooling.

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