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Estimation of Multidimensional Urban Poverty in South Asian Cities: A Case of Lahore Metropolitan Area

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Continuous monitoring of spatial variations in urban poverty is a complex multidimensional phenomenon. In urban areas of South Asian countries, various factors contribute to promote urban poverty e.g., rapid and unmanaged urbanization, high migration and inflation rates and fluctuations in land values. The poor community should be focused by policy makers to solve poverty related issues. This research was conducted in a metropolitan city Lahore in Punjab province of Pakistan which is confronting with urban poverty and need to construct a policy for poverty alleviation. Alkire-Foster approach was used to compute urban poverty by selecting poverty cut off point k=2/5 for this study. It demonstrates that 70.8% of households were poor whereas 29.8% households were living out of poverty with positive potentials. The results can be taken as a reference point to alleviate poverty in other regions of country.
Keywords: Multidimensional poverty; Metropolitan; Alkire & Foster approach; poverty cut off point and poverty indices.

Introduction.

Poverty refers to pronounced deprivations in human well-being in various dimensions [1,2]. It is considered a complex and multifaceted phenomenon [3] to evaluate for rapidly growing urban areas. Poverty has become a major challenge to the socio-economic prosperity for almost half of the world [4]. The poverty was deep rooted in rural areas, but it has become obvious and prevailing urban issue from the last few decades [4]. In urban areas of South Asian countries, various factors contribute to promote urban poverty e.g., rapid, and unmanaged urbanization, high migration and inflation rates and fluctuations in land values [5,6]. Construction and expansion of squatter settlements and slums in center and periphery of cities is the root cause of poverty in urban areas [7].

Living in poverty excludes people from opportunities and decent employment [8] consequently, affecting their psychological and societal well-beings. It is responsible for generating other social issues like street crimes, environmental pollution and availability of clean water [9, 10, 11]. Therefore, Sustainable Development Goals (SDGs) adopted by United

Nations in 2015 include eradication of poverty as the prime target to be achieved by 2030. The reforms need to be introduced to achieve the ultimate prosperity. By taking into account, the adverse impacts of poverty as well as in achieving the poverty eradication goals, substantial literature helps to analyze all hurdles on the way of prosperity and to analyze all issues more appropriately.

Paradigm Shift in Poverty Measuring Approaches

Poverty is considered as multidimensional issue and it has been widely evaluated using traditional one-dimensional approach in broader aspect i.e., income or consumption. In recent years, a growing consensus regarding the insufficiency of one-dimensional poverty measure arouse the need for multidimensional poverty measures which could reflect the poverty situation more comprehensively. Consequently, in 2007 Alkire and Foster (AF) formulated a comprehensive dual cut off method for evaluating poverty in multidimensional perspective. AF method has been widely used by researchers and policy makers because of its friendly mechanism [12, 13, 14, 15]. AF method is considered as one of the best multidimensional poverty measuring mechanism [16] [17].

Multidimensional Poverty Index (MPI) is an index developed by Alkire and Santos (2010) which follows Alkire and Foster (2007, 2011) dual cut off methodology for poverty evaluation [18]. MPI portrays the in-depth picture of poverty in multiple dimensions as well as monitoring the progress in achieving SDG i.e., aims to eliminate poverty by 2030 from everywhere. Therefore, estimation of MPI by using AF methodology has gained vast attention globally by researchers and policy makers in recent years [18, 19, 20].

The poverty has become one of the largest problems due to its influence over global population specially in South Asian countries. It is surveyed that about 1.3 billion people i.e. 23.1% of global population is multidimensional poor out of which 792 million belong to lower/middle income countries where poverty index ranges from 0 to 86.7% [21]. Pakistan lies below the line of middle income countries.

Poverty Assessment in Pakistan

As a result of commitment with UN in achieving SDGs, MPI was created first time in Pakistan in 2016 by using data from Pakistan Social and Living Standard Measurement (PSLM) surveys. About 38.8% people were found multidimensional poor with average proportion of deprivations of about 50.9% and MPI was 0.198 [22]. In Pakistan, some studies have been conducted for assessment of poverty in multidimensional perspective by adopting AF methodology. Idrees, M. (2017) [23] prepared poverty indices for Pakistan through AF approach by taking 6 dimensions that include education, health, house services, quality of house, additional services and women empowerment. Multidimensional Poverty was also estimated for Pakistan at national and provincial levels by adopting AF approach [24]. In addition MPI was generated for Punjab province at district level [25].

Moreover, different studies have been conducted to assess poverty for different cities of Pakistan. Khan A.U (2014) [26] examined the magnitude of multidimensional poverty in Rawalpindi city by incorporating education, health and living style of residents. Determinants of urban poverty have also been analyzed in Multan [27] and Sargodha city [28]. Furthermore, the magnitude and determinants of poverty have been analyzed for Christian [29].

In order to properly address this issue and achieving SDG, poverty evaluation studies may be enriched at lowest administration level of major cities like Lahore and Karachi where intra-city disparities predominantly found which in turn cause urban poverty.

Urban poverty is known as one of major issues in Lahore city where inter-city inequalities prevails in great extent. The most visible demonstration of this issue is the increase in the quantity and physical density of inner-city slums due to current urban trends. Therefore, Ravi Zone in Lahore metropolitan area is selected to assess urban poverty along with identifying its key contributors.

Materials and Methods

Investigation site.

Ravi town is one of the administrative zones in Lahore metropolitan area, located north-west of Lahore as shown in Figure 1. The latitudinal and longitudinal extent of Ravi Zone is from 74.249° – 74.307° N and 31.589° – 31.616° E respectively. The population of Ravi Zone is approximately 1368506 along with 152750 total number of households (Ravi Zone Administrative Office). River Ravi also flows across north-south of this zone. Ravi zone is segregated into three administrative zones including Shahdra, Badami Bagh and Walled city. It has total 34 Union Councils (UCs-Union councils are the smallest administrative unit within a city) out of which 14 UCs lies in Shahdra zone, 12 UCs in Badami Bagh zone whereas Walled city zone has 8 UCs.

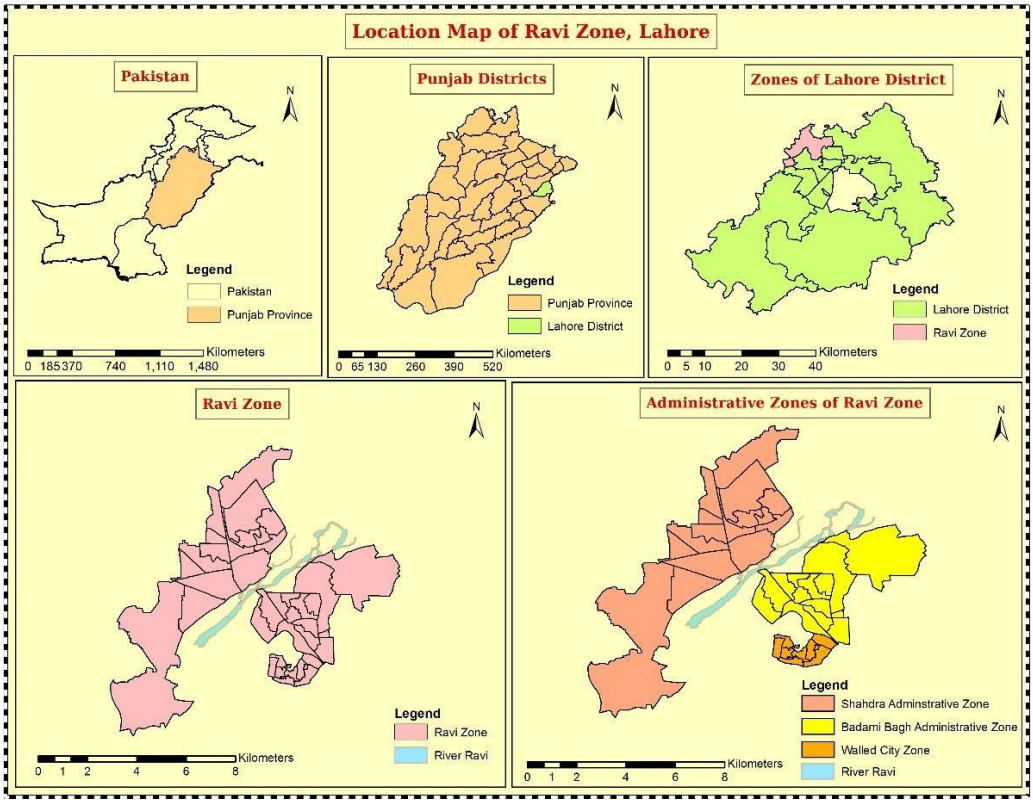

Figure 1 Study Area Map

Ravi Zone is diverse in nature as compared to other 8 zones of Lahore. The area of walled city is most densely populated, where people have substandard living conditions. In addition, Shahdra and adjoining areas that constitute the periphery of Lahore metropolitan area in north also falls under this zone. The squatter settlements are predominantly found in Ravi zone.

2.2. Material and methods

Data Collection and Instrument

The present study is based on both primary and secondary data collection and its analysis. Questionnaire was used as an instrument to collect primary data comprising both closed and open ended questions related to the factors associated with poverty (Questionnaire is attached in annexures). Secondary data was also collected from Administrative Office of Ravi Zone regarding the recent statistics about total households and population. Recent GIS based Shapefiles of Ravi Zone were collected from Urban Unit P&D Punjab Pakistan.

Sample Size and Sampling Technique

We selected a unique household as a unit of analysis and 510 sample households were selected from Ravi Zone. Two step selection procedure was used for sample collection. In the first step 510 sample households were equally distributed among all UCs. In the second step, sample households from all UCs were selected through convenience sampling. As in this study the prime focus was only on poor households. Therefore, sample household were selected through convenience sampling by keeping the assumption in mind that poor household condition is directly associated with poverty in order to make samples truly representative of research area.

2.3. Data Analysis

In this study, data analysis were performed in Microsoft Excel with the help of analytical tool i.e. Alkire and Foster (2007; 2011) approach to evaluate multidimensional poverty. The data analysis was performed in two main sections. The first section analyzed data by estimating multidimensional poverty through three poverty indices: headcount ratio (H), intensity of poverty (A) and MPI. In second section, data was analyzed by identifying the percentage contribution of each indicator to overall poverty in order to find the most prevalent factor that contribute in poverty. The detail of these sections are as under:

Evaluation of Multidimensional Poverty

The study adopted following steps for multidimensional poverty measurement as suggested by Alkire & Foster (2007; 2011).

a) Selection of dimensions and indicators
b) Define poverty cut off points for each indicator
c) Assigning weights to each dimension and indicators
d) Define second poverty cut off point (to identify poor)
e) Calculation of deprivation score for each household
f) Calculation of Incidence of Poverty (H)
g) Calculation of Intensity of Poverty (A)
h) Calculation of Multidimensional Poverty Index (MPI)

Selection of Indicators and Dimensions

Alkire and Foster (2007; 2011) measured multidimensional poverty through 3 dimensions: education, health and living standard with 10 different relative indicators. As Alkire and Foster method is flexible in the selection of dimensions and indicators so the present study assessed multidimensional poverty by using 5 dimensions including education, health, housing condition, housing services quality and employment which are further sub divided into 16 different relative indicators. In this study the selection of dimensions and indicators were primarily based on existing literature of poverty assessment studies. Moreover, the selected dimensions and indicators in this study also corresponds to SDGs which may further help policy makers to monitor the existing situation in achieving these goals by 2030. Table 1 shows the selected dimensions along with their relative indicators.

Poverty Cut off Point for each Indicator

Poverty cut off point also known as poverty line which is defined as a benchmark upon which a household is declared as deprived in the respective indicator. A household is considered as deprived in particular indicator and denoted by 1 only if the household member's achievement in that indicator falls under the given poverty cut off point otherwise considered as non-deprived and denoted by 0 (Alkire, 2007, 2011).

Table 1. Dimensions and Indicators along with their cut off points and their relation with SDGs.

Dimensions	Indicators	SDGs	Poverty cut off Points A household is considered deprived if…….
Education	1. Attainment of Primary Education	SDG4	None of its adult member aged 15 years and above has attained primary education
	2. Child Enrolment status	SDG4	At least one child of school going age (6-14 years) has not enrolled in school
Health	1. Health Status	SDG3	At least one member has serious illness and unable to perform his/her normal activities
	2. Child Mortality	SDG3	At least one child of age between 0-5 years has been died in household
Housing Condition	1. Roof Material	SGD11	Household has unimproved roof material (i.e. wooden planks, iron sheets, bamboo)
	2. Wall Material	SDG11	Household has unimproved wall material (i.e. mud, unbaked bricks)
	3. Floor Material	SDG11	Household has unfinished floor
	4. Kitchen facility	SDG11	Household has no separate kitchen facility
	5. Toilet facility	SDG6	Household either don't have toilet facility or shared toilet facility
	6. Housing Congestion	SDG11	4 and more than 4 people are living in one room
Housing Services Quality	1. Electricity	SDG7	Household has no electricity
	2. Cooking Fuel	SDG7	Household uses animal dung and wood sticks for cooking purpose
	3. Access to save drinking water	SDG6	Household does not have access to safe drinking water
	4. Household Assets	SDG11	Household owns less than 50% of household assets
Employment	1. Employment status	SDG8	Whether Household head is unemployed or employed as temporary, occasional and causal worker
	2. Quality of Employment	SDG11	Household head is unskilled wage labor in informal sector

Assigning Weights to Dimension and Indicator

The equal weights were assigned to all dimensions and their relevant indicators. Different weights can also be assigned to dimensions and indicators based on their relative importance but it is very difficult and involves valuable judgement by experts. So the present study assign equal weights to all dimensions and their respective indicators with the help of equal weighting principle as suggested by Alkire and Foster (2007; 2011).

Table 2. Weights Assigned to Each Dimension and Indicator

Dimension	Relative Weights	Indicators	Relative Weight
Education	0.2	1. Attainment of Primary Education	0.1
		2. Child Enrolment status	0.1
Health	0.2	1. Health Status	0.1
		2. Child Mortality	0.1
Housing Condition	0.2	1. Roof Material	0.0333
		2. Wall Material	0.0333
		3. Floor Material	0.0333
		4. Kitchen facility	0.0333
		5. Toilet facility	0.0333
		6. Housing Congestion	0.0333
Housing Services Quality	0.2	1. Electricity	0.05
		2. Cooking Fuel	0.05
		3. Access to save drinking water	0.05
		4. Household Assets	0.05
Employment	0.2	1. Employment status	0.1
		2. Type of Employment/Quality of Employment	0.1
5 Dimensions	1.00	16 Indicators	1.00

Selection of Second Poverty cut of point

Second poverty cut off point (k) is used to identify the MPI-poor households. Three different approaches are introduced for the identification of poor or deprived households: union, intermediate and intersection approach (Alkire & Foster, 2007, 2011). In union approach household is declared as poor if the household is deprived in any one out of all dimension whereas in intersection approach household is considered as poor if he/she is deprived in all selected dimensions. Identification of poor by using these two extreme approaches can provide misleading statistics. Therefore, intermediate approach has been widely used in literature for the identification of poor. As the present study have total five dimensions therefore, k can be set as: 1/5, 2/5, 3/5, 4/5 and 5/5.

Calculation of Deprivation Score

Deprivation score (c_i) of each household is calculated to identify MPI-poor household. Household is considered as MPI-poor if the deprivation score of each household is greater than or equal to the selected poverty cut off point.

Deprivation score of each household is calculated using the following formula:

$$Ci = Sum\ of\ indicator\ deprivation \times weight\ of\ indicator$$

Calculation of Head Count Ratio (H)

Headcount ratio is also known as incidence of poverty (H) which provides the proportion of MPI-poor households at the selected poverty cut off point. It is calculated with the help of following formula:

$$H = \frac{Number\ of\ multidimensional\ poor\ households}{Total\ numer\ of\ houses}$$

Calculation of Intensity of Poverty (A)

Intensity of poverty also known as average deprivation which estimates the average proportion of deprivations among MPI-poor households in weighted sum of indicators. It is calculated through following formula:

$$A = \frac{(Deprivation\ Score\ of\ Deprived\ Household \times HH\ size)}{Number\ of\ deprived\ houses}$$

Calculation of Multidimensional Poverty Index

Multidimensional Poverty Index (MPI) also known as Adjusted Headcount Ratio (M_0), which reflects the breadth of poverty i.e. percentage of MPI-poor along with proportion of average deprivations which they experience. It is calculated by:

$$MPI = Headcount\ Ratio\ (H) \times Intensity\ of\ Poverty(A)$$

Percentage Contribution of each indicator

In order to find out the most prevalent indicator that contribute in overall poverty, contribution of each indicator was also calculated by following formula:

$$Contribution\ of Indicator = \frac{(W_i \times CHR_i)}{MPI} \times 100$$

Where W_i = weight of that indicator

CHR_i = censored headcount ratio of that indicator

CHR reflects indicator-wise deprivations of only those households who are categorized as MPI-poor according at selected poverty line.

Results and Discussions.

Multidimensional Poverty Estimates for Ravi Zone

Multidimensional poverty estimates for Ravi Zone are presented at different poverty cut off points (*k*). The results empirically justifies that as the value of k increases, Headcount ratio (H) and MPI decreases whereas Intensity increases (A). The results indicate that if we set poverty cut off point (k) by using two extreme approaches i.e. union approach where k = 1/5 and intersection approach where k = 5/5 then these poverty lines will present very high and very low statistics respectively as shown in Table 3. Therefore, in our study we used intermediate approach by taking k = 2/5 as poverty cut off point which was suitable enough for poverty assessment in our case. At our selected poverty cut off point i.e. k = 2/5, 70.8% households are categorized as multidimensional poor with the average proportion of weighted deprivation is 58.0% and MPI being 0.401. The results further depict a positive condition by indicating that very few or no households seems to be deprived at 4/5 and 5/5 poverty cut off point.

Table 3. Multidimensional Poverty Estimates of Ravi Zone

Poverty cut off Points	Ravi Zone Statistics		
	H	A	MPI
k = 1/5	100%	50.6%	0.506
k = 2/5	70.8%	58.0%	0.410

k = 3/5	21.2%	68.6%	0.145
k = 4/5	0.9%	84.1%	0.007
k = 5/5	0%	0%	0.00

Source: Authors computation from Household Survey (2019)

Estimates of Poverty at Administrative Zone level

Multidimensional poverty estimates when segregated at administrative zone level then the results shows that at k = 2/5, Shahdra Zone records the highest incidence of poverty where 80% of the people are MPI-poor and remaining 20% are categorized as non-poor while in Badami Bagh 65% and in Walled City Zone 35% households are categorized as MPI-poor. MPI-poor of Shahdra zone faced the highest level of deprivations i.e. on average they are deprived in 56% of weighted indicators. In Badami Bagh and Walled City Zone the MPI-poor experience was relatively low. Likewise in case of MPI, Shahdra Zone reflects the highest breadth of poverty i.e. 0.45 whereas Badami Bagh and Walled city zone has relatively low breath of poverty with very slight difference in statistics i.e. 0.35 and 0.32 respectively.

The analysis revealed that Shahdra Zone ranked 1st in all three poverty indices as compared to other zones. Although other two zones have relatively low poverty estimates but a very slight difference is found in the statistics among these two zones.

Table 4. Multidimensional Poverty estimates at Administrative Zone Level

Administrative Zones	k= 2/5			Ranking of Zones
	H	A	MPI	
Shahdra	80%	56%	0.45	1
Badami Bagh	65%	54%	0.35	2
Walled City	60%	53%	0.32	3

Source: Authors computation from Household Survey (2019)

A) Contributors to Poverty at Administrative Zone Level

MPI was decomposed to identify the contribution of each indicator and dimension to overall poverty.

a) Contribution of each indicators to Poverty

The results indicate that in all three zones; Shahdra, Badami Bagh and Walled City, attainment of primary education contributed most to poverty among all indicators with a very slight difference in statistics i.e. 17.4%, 16.9% and 17.7% respectively. Quality of employment made the second whereas child labor status made the third highest contribution to poverty among all zones. The results are shown in Figure 2,

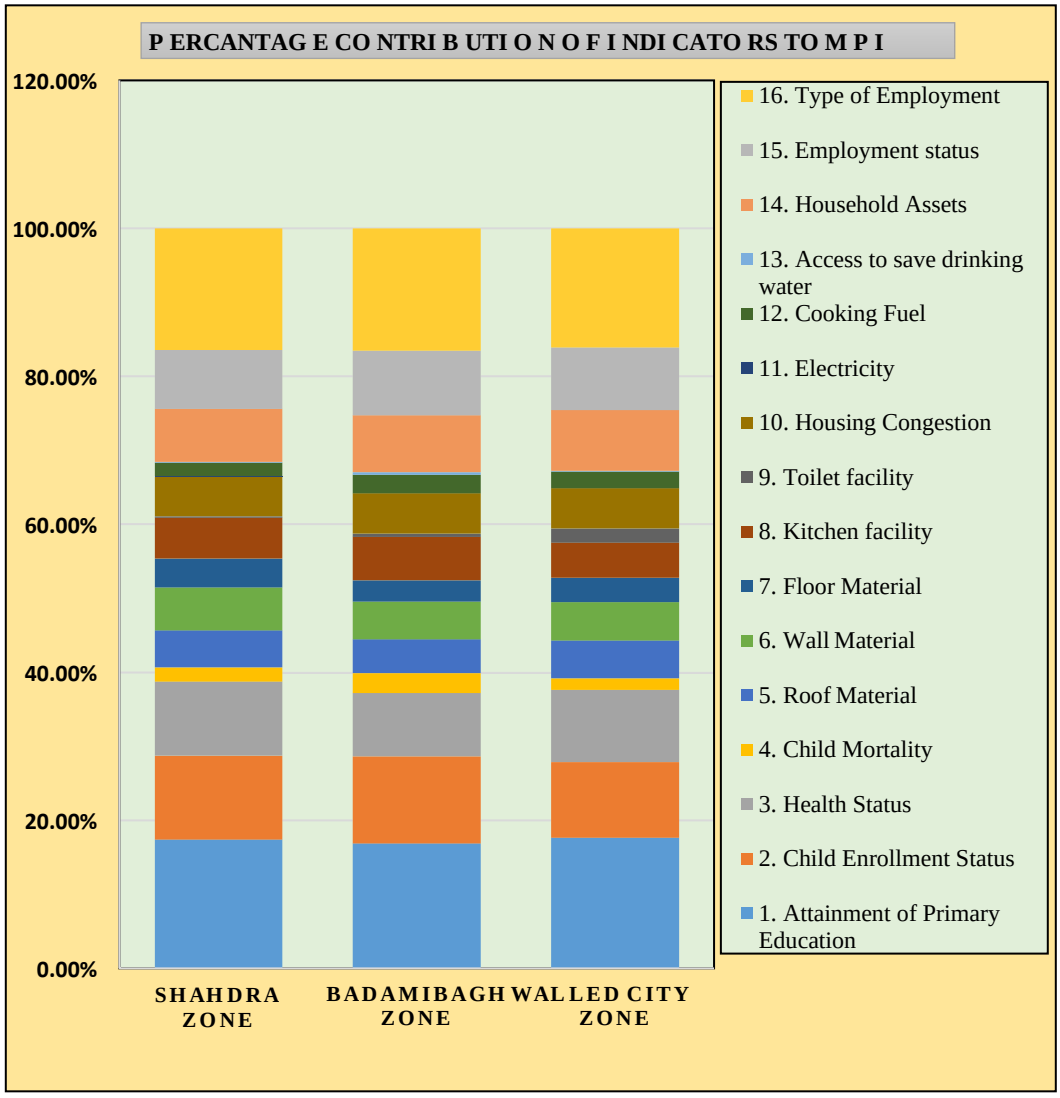

Figure 2. Contribution of each indicators to Poverty

b) Contribution of each Dimension to Poverty

The results indicate that education dimension contributed most to overall poverty among all administrative zones with a very slight difference in statistics. Employment made the second highest contribution to poverty in Badami Bagh zone of about 25.3% whereas in Shahdra and Walled City zone housing, the condition made second highest contribution i.e., 25.7% and 25.8% respectively. Employment made third highest contribution in Shahdra and walled city zones whereas in Badami Bagh Zone, housing condition made third highest contribution to poverty. Housing Services Quality had least contribution in poverty among all three zones. The results are shown in Figure 3,

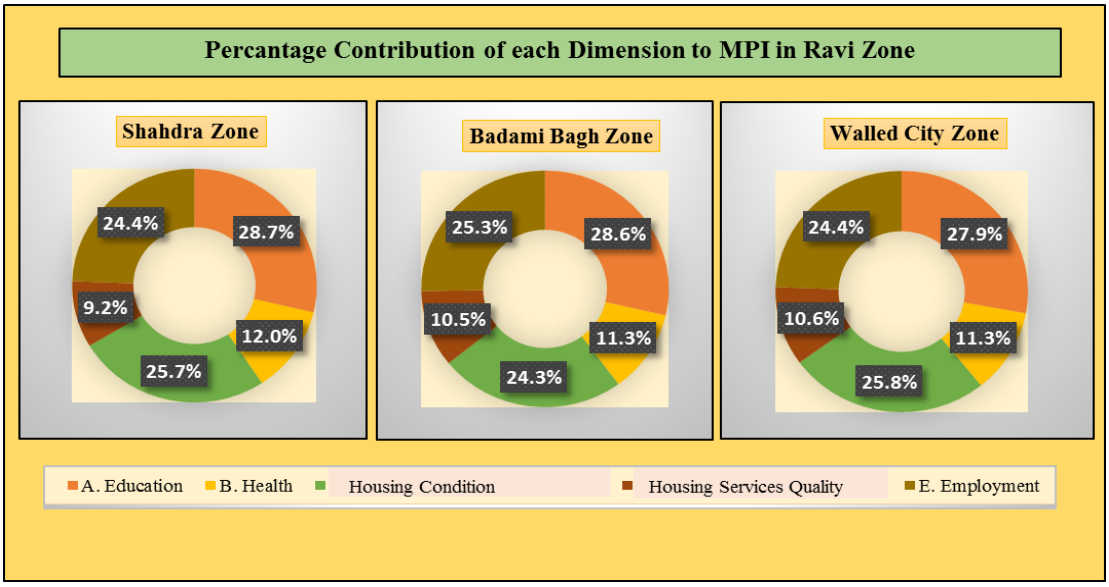

Figure 3. Contribution of each Dimension to Poverty

B) Estimates of Poverty at UC level

Estimates of multidimensional poverty at UC level were computed with the help of choropleth thematic map to illuminate inequalities across UCs. The results demonstrates that UC-wise poverty incidence is ranging from 30-95%. Accordingly, UCs are classified into five main categories: very low poverty (30-38%), low poverty (39-59%), moderate poverty (60-68%), high poverty (69-80%) and very high poverty (81-95%). The results demonstrates that Shams Abad, Chah Chambay Wala, Javaid Park, Majeed Park, Aziz Colony, Ladhey Shah, Ravi Clifton Colony, Hanif Park, Bhama Jhuggian and Bhatti Gate have very high poverty incidence among all. Whereas 3 UCs Qila Lakshaman Singh, Auqaf Colony and Badar Colony experience very low poverty incidence.

In case of intensity of poverty, UCs were again classified into five categories: very low poverty intensity (47-49%), low poverty intensity (50-52%), moderate poverty intensity (53-55%), high poverty intensity (56-58%) and very high poverty intensity (59-63%). High poverty intensity was found in 8 UCs: Javaid Park, Qazi Park, Begum Kot, Bhama Jhuggian, Hanif Park, Siddique Pura, Bhatti Gate and Shahi Qila where MPI poor on average deprived about 59-63% in weighted sum of indicators. In UCs like Siddiqia Colony, Badar Colony, Qila Lakshaman Singh, Data Nagar and Azam Market MPI-poor have very low intensity of poverty. MPI values at UC level vary from 0.15-0.55 on the basis of this range UCs were categorized into very low MPI values (0.15-0.24), low MPI values (0.25-0.32), moderate MPI values (0.33-0.41) high MPI values (0.42-0.47) and very high MPI values (0.48-0.55). Javaid Park, Majeed Park, Chah Chambay Wala, Bhama Jhuggian, Hanif Park and Bhatti Gate have very high MPI-values. On the other hand MPI values found to be very low in Badar Colony, Auqaf Colony, Qila Lakshaman Singh, Azam Market and Shah Alam Market indicating that all UCs with low MPI values lie under the Walled city and Badami Bagh Zones. The analysis revealed that 1 UC Javaid Park from Shahdra Zone, 2 UCs Hanif Park and Bhama Jhuggian from Badami Bagh Zone and only 1 UC Bhatti Gate from Walled City Zone records very high poverty indices and were categorized as highly deprived UCs. The results are shown in Figure 4.

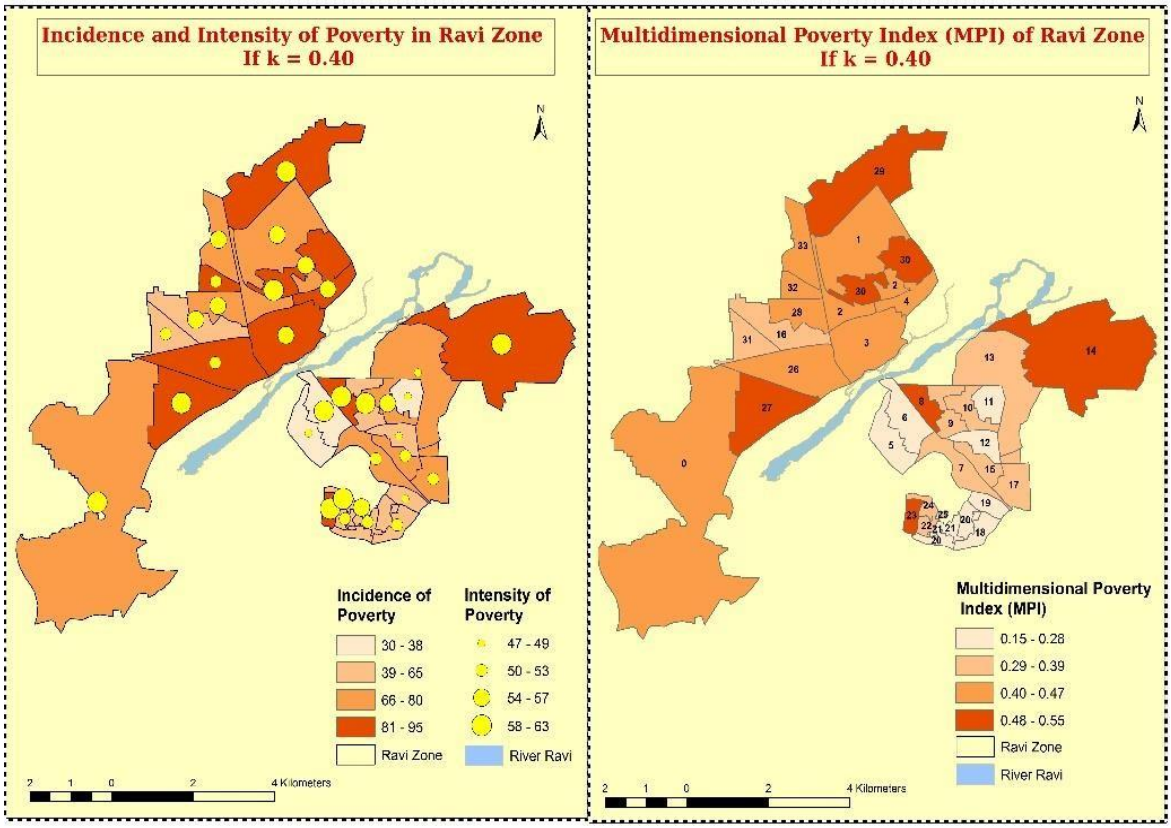

Figure 4. Multidimensional Poverty Indices at UC Level in Ravi Zone

0.Begum Kot	7. Farooq Gunj	14.Bhama Jhuggian	21.Rang Mahal	28. Lajpat Nagar
1.Qaiser Town	8. Hanif Park	15.Usman Gunj	22.Lohari Gate	29. Javaid Park
2.Qazi Park	9.Siddique Pura	16. Jia Musa	23.Bhatti Gate	30. Majeed Park
3.Ravi Clifton Colony	10.Larex Colony	17. Manzor Abad	24. Shahi Qila	31. Yousaf Park
4.Ladhay Shah	11.Badar Colony	18.Mochi Gate	25. Sotar Mandi	32. Aziz Colony
5. Qila Lakshaman Singh	12.Data Nagar	19.Azam Market	26. Shams Abad	33. Faisal Park
6. Auqaf Colony	13.Siddiqia Colony	20.Shah Alam Market	27.Chah Chambay Wala	33. Faisal Park

Main Contributors to Poverty at UC level

a) Contribution of each indicators to Poverty

The results revealed variability between two indicators: attainment of primary education and quality of employment. Attainment of primary education make the highest contribution to poverty among 19 UCs whereas in 6 UCs quality of employment contributed highest. In remaining 9 UCs, both indicators contributed equally in poverty. While child enrollment status contributed as second highest to poverty among 18 UCs. On the other hand, two indicators: electricity facility and access to save drinking makes the lowest contribution among UCs. Table5 presents percentage contribution of each indicator to poverty at UC level.

Table 5. Percentage Contribution of each Indicator to Poverty at UC Level

UCs Name	Percentage Contribution of each Indicator															
	Education Indicators		Health Indicators		Housing Condition Indicators						Housing Services Quality				Employment Indicators	
	1[1]	2[2]	1[3]	2[4]	1[5]	2[6]	3[7]	4[8]	5[9]	6[10]	1[11]	2[12]	3[13]	4[14]	1[15]	2[16]
Begum kot	16.4	9.3	12.9	3.1	4.7	5.5	4.6	3.8	0.6	3.8	0.9	1.6	0.9	5.6	11.0	15.2
Yousaf Park	19.4	16.0	6.6	4.4	5.1	5.6	4.7	6.0	0.0	6.0	0.0	0.9	0.0	5.8	4.1	15.3
Jia Musa	17.7	8.1	8.4	3.0	5.4	5.3	4.7	5.6	0.0	5.9	0.0	1.0	0.0	6.4	11.0	17.6
Shams Abad	18.6	10.4	8.4	0.0	5.9	5.8	5.9	4.9	2.0	5.4	0.0	2.4	0.0	6.3	7.9	16.1
Chah ChemayWala	14.4	10.3	14.0	1.4	4.8	5.7	5.7	5.7	0.0	4.9	0.0	4.4	0.3	6.4	5.6	16.2
Aziz Colony	19.6	12.7	10.1	0.0	5.5	6.0	2.5	6.5	0.0	5.5	0.0	0.0	0.0	8.1	6.6	16.7
Lajpat Nagar	17.4	9.1	12.9	1.3	5.4	5.8	1.9	5.4	0.0	5.5	0.0	1.6	0.0	7.8	10.3	15.6
Faisal Park	17.4	9.6	14.3	3.1	2.8	5.8	1.3	5.4	0.0	5.8	0.0	2.3	0.0	7.9	9.9	14.5
Javeed Park	16.4	12.5	12.1	1.3	4.7	5.5	3.2	5.5	0.0	4.5	0.0	3.2	0.0	7.7	6.9	16.4
Qaiser Town	18.5	11.7	9.6	1.0	3.5	6.2	2.3	5.6	0.0	5.3	0.0	1.5	0.0	7.7	8.6	18.5
Majeed Park	17.6	13.1	6.9	1.3	5.9	5.9	3.9	5.9	0.0	5.3	0.0	1.6	0.0	8.2	6.9	17.6
Qazi Park	16.9	14.6	10.2	0.0	4.4	5.6	4.2	5.6	0.0	5.6	0.0	2.3	0.0	6.3	10.0	14.4
Ravi Clifton Colony	18.1	12.7	7.1	1.5	4.9	6.0	4.6	6.0	0.0	5.8	0.0	0.0	0.0	9.0	6.3	18.1
Ladhey Shah	18.1	8.7	6.6	5.5	5.2	6.0	4.0	5.8	0.0	5.8	0.0	0.0	0.0	8.3	7.9	18.1
Qila Lakshaman Singh	20.0	8.0	12.0	0.0	4.8	5.7	2.6	6.4	0.0	5.1	0.0	5.4	0.0	4.0	5.0	21.0
Auqaf Colony	17.0	12.4	4.6	0.0	5.7	3.7	2.8	5.7	0.0	5.5	0.0	0.0	0.0	8.5	16.9	17.0
Farooq Gangh	19.4	3.8	14.5	1.1	3.9	6.5	2.6	6.5	0.5	6.5	0.0	2.0	0.0	6.9	9.0	16.7
Hanif Park	15.8	13.1	5.9	5.5	4.9	5.3	3.5	4.6	0.0	5.3	0.0	4.3	2.1	7.0	6.8	15.9
Siddique Pura	10.7	10.7	8.1	5.8	5.3	5.6	5.3	5.6	0.0	5.3	0.0	4.5	0.0	8.4	7.6	16.8
Larex Colony	17.1	17.0	7.9	0.0	4.7	5.9	1.2	5.9	0.0	6.4	0.0	0.0	0.0	8.8	11.6	13.5
Badar Colony	20.7	7.4	10.4	0.0	5.7	6.9	2.5	6.2	0.0	6.2	0.0	0.0	0.0	9.6	3.7	20.7
Data Nagar	15.4	8.9	2.7	1.9	5.9	6.7	3.3	6.7	1.7	6.7	0.0	0.0	0.0	8.7	11.5	20.0
Siddiqia Colony	18.6	16.0	10.1	0.0	4.6	6.9	2.7	6.9	0.0	5.7	0.0	0.0	0.0	4.1	6.5	17.9
Bhaman Jhuggian	16.9	13.1	4.2	3.3	4.4	5.6	5.0	5.6	0.0	5.4	0.0	6.0	0.0	7.6	7.7	15.2
Usman Gangh	17.7	13.7	10.9	1.1	4.2	2.1	2.1	6.4	1.4	5.1	0.0	0.7	0.0	9.8	10.9	14.0
Manzoorabad	17.8	11.4	10.4	5.0	4.6	0.4	1.1	6.5	0.0	4.3	0.0	3.3	0.0	9.8	8.2	17.0
Mochi Gate	19.6	8.9	14.7	5.5	4.5	3.6	3.6	3.8	0.9	3.8	0.0	1.4	1.4	6.9	7.9	13.8
Azam Market	20.6	13.5	4.3	0.7	4.0	6.9	2.2	1.1	3.2	5.4	0.0	0.0	0.0	10.3	9.6	18.1
Shah Alam Market	15.3	6.4	12.1	4.8	5.0	3.5	2.0	3.9	0.9	5.8	0.0	4.4	0.4	10.2	12.5	12.5
Rang Mehal	17.4	13.1	9.4	2.2	5.6	5.4	4.1	4.9	0.0	6.4	0.0	0.6	0.0	7.0	9.9	14.1
Lohari Gate	19.8	10.8	7.6	0.0	4.5	6.6	2.4	5.7	1.3	6.4	0.0	1.0	0.0	9.0	5.9	19.1
Bhatti Gate	16.9	7.9	9.6	0.4	5.3	5.6	3.9	5.6	3.3	5.1	0.0	5.0	0.0	8.5	5.8	16.9
Shahi Qila	16.9	13.3	8.3	0.0	5.6	5.0	2.5	5.6	2.6	5.6	0.0	3.0	0.0	4.7	10.0	16.9
Sotar Mandi	15.5	8.4	10.8	0.0	5.9	5.9	4.6	5.9	1.8	5.9	0.0	0.9	0.0	8.8	8.0	17.6

Note: Yellow color in table highlight the indicator which makes highest contribution in poverty. Blue color highlights second highest Contribution. Gery color highlights third highest contributor and Green color highlights equal contribution of indicators.

[1] Attainment of Primary Education
[2] Child Enrollment Status
[3] Health Status
[4] Child Mortality
[5] Wall Material
[6] Roof Material
[7] Floor Material
[8] Kitchen Facility
[9] Toilet Facility
[10] Housing Congestion
[11] Electricity Facility
[12] Cooking Fuel
[13] Assess to save drinking water
[14] Household Assets
[15] Employment Status
[16] Quality of Employment

Source: Authors Computation from Household Survey (2019).

b) Contribution of each Dimension to Poverty

The results demonstrate the variability among dimensions across UCs regarding highest contribution. In 24 UCs, education contributed highest whereas housing condition make highest contribution in 6 UCs although in 4 UCs employment dimension highly contributed to overall poverty. Table 6 shows the dimension-wise contribution to poverty among all UCs.

Table 6. Percentage Contribution of each Dimension to Overall Poverty

UCs Name	Percentage Contribution of each Dimension to Overall Poverty				
	Education	Health	Housing Condition	Housing Services Quality	Employment
Begum kot	26.5%	14.6%	25.2%	8.3%	25.4%
Yousaf Park	35.4%	11.0%	27.5%	6.7%	19.4%
Jia Musa	25.7%	11.4%	26.8%	7.5%	28.6%
Shams Abad	29.0%	8.4%	29.8%	8.7%	24.1%
Chah ChemayWala	24.7%	15.4%	26.9%	11.1%	21.8%
Aziz Colony	32.3%	10.1%	26.1%	8.1%	23.3%
Lajpat Nagar	26.5%	14.1%	24.0%	9.5%	26.0%
Faisal Park	27.0%	17.4%	21.0%	10.2%	24.4%
Javeed Park	29.0%	13.4%	23.4%	10.9%	23.3%
Qaiser Town	30.2%	10.6%	22.8%	9.3%	27.1%
Majeed Park	30.7%	8.2%	26.8%	9.8%	24.5%
Qazi Park	31.5%	10.2%	25.4%	8.6%	24.3%
Ravi Clifton Colony	30.7%	8.5%	27.3%	9.0%	24.4%
Ladhey Shah	26.8%	12.1%	26.8%	8.3%	25.9%
Qila Lakshaman Singh	28.0%	12.0%	24.6%	9.4%	26.0%
Auqaf Colony	29.5%	4.6%	23.3%	8.5%	34.1%
Farooq Gangh	23.3%	15.6%	26.5%	8.9%	25.8%
Hanif Park	28.9%	11.4%	23.6%	13.4%	22.7%
Siddique Pura	21.4%	13.9%	27.1%	12.9%	24.6%
Larex Colony	34.1%	7.9%	24.1%	8.8%	25.1%
Badar Colony	28.2%	9.6%	27.4%	10.4%	24.5%
Data Nagar	24.3%	4.6%	30.9%	8.7%	31.6%
Siddiqia Colony	34.5%	10.1%	26.9%	4.1%	24.4%
Bhaman Jhuggian	30.0%	7.5%	26.0%	13.6%	22.9%
Usman Gangh	31.5%	12.0%	21.3%	10.3%	24.9%
Manzoorabad	29.2%	15.4%	17.0%	13.1%	25.2%
Mochi Gate	28.4%	20.2%	20.1%	9.6%	21.7%
Azam Market	34.1%	5.0%	22.8%	10.3%	27.7%
Shah Alam Market	21.7%	16.9%	21.0%	15.1%	25.3%
Rang Mehal	30.5%	11.6%	26.3%	7.6%	24.0%
Lohari Gate	30.5%	7.6%	26.8%	10.1%	25.0%
Bhatti Gate	24.8%	10.1%	28.9%	13.5%	22.7%
Shahi Qila	30.1%	8.3%	27.0%	7.7%	26.9%
Sotar Mandi	23.8%	10.8%	29.9%	9.8%	25.7%

Note: Yellow color highlight the dimension which makes highest contribution in poverty. Blue color highlights second highest, Green color highlights third highest contributor and purple color highlights forth highest contribution.
Source: Authors Computation from Household Survey (2019).

Conclusion

It was revealed that poverty cut off points (k) affect poverty estimates. As the value of k increases, two multidimensional poverty indices: H and MPI continues to decrease whereas A increases. The study concluded that in Ravi Zone, 70.8% of households are considered as MPI-poor whereas 29.8% households are living out of poverty with positive potentials. The results revealed that in Ravi Zone, Shahdra administrative zone found to be highly deprived as compared to other two zones. In case of UCs, 4 UCs: Javaid Park, Hanif Park, Bhama Jhuggian and Bhatti Gate are categorized as highly deprived in Ravi zone.

The study further revealed that in Ravi zone, attainment of primary education followed by quality of employment and child enrollment status played a vital role in driving poverty. The results showing an alarming situation because these three indicators have a significant correlation with each other i.e., attainment of primary education determine quality of employment which in turn effects child enrollment status because people with low education which is unable to get better jobs which meet their needs so they engage their children in child labor despite of educating them. It is recommended that government and policy makers should concentrate in creating quality job opportunities for the unskilled and uneducated people.

Future Avenues

- ❖ This study can be further enhanced by assessing multidimensional poverty in all zones of Lahore at segregated administrative unit levels.
- ❖ Multidimensional poverty measuring tool can be further enhanced by adding more dimensions and indicators in it.
- ❖ The study can further assign unequal weights to different indicators and dimensions according to their relative importance.

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REFERENCES

[1] World Bank. (2000). *World development report 2000-2001: attacking poverty*. World Bank Group.

[2] Haughton, J., & Khandker, S. R. (2009). Handbook on Poverty and Inequality: Washington. *DC: The World Bank*.

[3] Bhuiya, A., Mahmood, S. S., Rana, A. M., Wahed, T., Ahmed, S. M., & Chowdhury, A. M. R. (2007). A multidimensional approach to measure poverty in rural Bangladesh. *Journal of health, population, and nutrition*, *25*(2), 134.

[4] Khan, A. U., Saboor, A., Ali, I., Malik, W. S., & Mahmood, K. (2016). Urbanization of multidimensional poverty: empirical evidences from Pakistan. *Quality & quantity*, *50*(1), 439-469.

[5] UN-HABITAT (2016). *World Cities Report 2016: Urbanization and Development-Emerging Futures, UN, New York*, Retrieved from: http://doi.org/10.18356/d201a997-en.

[6] Elhadary, Y. A. E., & Samat, N. (2012). Political economy and urban poverty in the developing countries: Lessons learned from Sudan and Malaysia. *Journal of geography and Geology*, *4*(1), 212.

[7] Arimah, B. C. (2010). *The face of urban poverty: Explaining the prevalence of slums in developing countries* (No. 2010/30). WIDER working paper.

[8] Mercado, S., Havemann, K., Sami, M., & Ueda, H. (2007). Urban poverty: an urgent public health issue. *Journal of Urban Health*, *84*(1), 7.

[9] Seals, A., & Nunley, J. (2007). The effects of inflation and demographic change on property crime: A structural time series approach. *Department of Economics and Finance Working Paper Series. Middle Tennessee State University, Murfreesboro, TN*.

[10] Gillani, S. Y. M., Rehman, H. U., & Gill, A. R. (2009). Unemployment, poverty, inflation and crime nexus: Cointegration and causality analysis of Pakistan. *Pakistan Economic and Social Review*, 79-98.

[11] Hassan, M. S., Akbar, M. S., Wajid, A., & Arshed, N. (2016). Poverty, urbanization and crime: Are they related in Pakistan. *International Journal of Economics and Empirical Research*, *4*(9), 483-492.

[12] Vijaya, R. M., Lahoti, R., & Swaminathan, H. (2014). Moving from the household to the individual: Multidimensional poverty analysis. *World Development*, *59*, 70-81.

[13] Dehury, B., & Mohanty, S. K. (2015). Regional estimates of multidimensional poverty in India. *Economics: The Open-Access, Open-Assessment E-Journal*, *9*(2015-36), 1-35.

[14] Mahoozi, H. (2015). Gender and spatial disparity of multidimensional poverty in Iran.

[15] Gebreslassie, G. H. (2015). Multidimensional measurements of poverty analysis in urban areas of Afar Regional State. *International Journal of Science and Research*, *4*(7), 2627-2635.

[16] Gebreslassie, G. H. Comparison of Multidimensional Measurements of Poverty Analysis: Cross Sectional Data Evidence from Tigray.

[17] Dotter, C., & Klasen, S. (2017). *The Multidimensional Poverty Index: achievements, conceptual and empirical issues* (No. 233). Courant Research Centre: Poverty, Equity and Growth-Discussion Papers.

[18] Kumi-Boateng, B., Mireku-Gyimah, D., & Stemn, E. (2015). Where are the Poor? Mapping Out A GIS-Multidimensional Non-Monetary Poverty Index Approach for Ghana. *Ghana Mining Journal*, *15*(2), 11-20.

[19] Santos, M. E., & Villatoro, P. (2018). A multidimensional poverty index for Latin America. *Review of Income and Wealth*, *64*(1), 52-82.

[20] Ab-Rahim, R., & Mohammed, M. (2019). Multidimensional Poverty Index of Niger State, Nigeria. *International Journal of Academic Research in Business and Social Sciences*, *9*(7).

[21] Poverty, O., & Human Development Initiative. (2019). Global multidimensional poverty index 2019: illuminating inequalities.

[22] Oxford Poverty and Human Development Initiative (2017). *"Pakistan Country Briefing", Multidimensional Poverty Index Data Bank. OPHI, University of Oxford.* Retrievedfrom:https://www.undp.org/content/dam/pakistan/docs/MPI/Multidim ensional%20Poverty%20in%20Pakistan.

[23] Idrees, M. (2017). Poverty in Pakistan: A Region-Specific Analysis. *The Lahore Journal of Economics*, *22*(2), 139-163.

[24] Khan, F. N., & Akram, S. (2018). Sensitivity of multidimensional poverty index in Pakistan. *The Pakistan Journal of Social Issues*, *9*, 98-108.

[25] Afzal, M., Rafique, S., & Hameed, F. (2015). Measurement of living standards deprivation in Punjab using AF method (periodical comparison approach). *The Pakistan Development Review*, 739-762.

[26] Khan, A. U., Saboor, A., Hussain, A., Sadiq, S., & Mohsin, A. Q. (2014). Poverty assessment as a multidimensional socio-economic concept: the case of the Rawalpindi region in Pakistan. *Asia Pacific Journal of Social Work and Development*, *24*(4), 238-250.

[27] Chaudhry, I. S., Malik, S., & Imran, A. (2006). Urban poverty and governance: the case of Multan city. *The Pakistan Development Review*, 819-830.

[28] Awan, M. S., & Iqbal, N. (2010). Determinants of Urban Poverty: The Case of Medium Sized City in Pakistan. *Working Papers & Research Reports*, *2010*.

[29] Zahra, K., & Zafar, T. (2015). Marginality and multidimensional poverty: A case study of Christian community of Lahore, Pakistan. *Pakistan Journal of Commerce and Social Sciences (PJCSS)*, *9*(2), 322-335.

Annexures

Questionnaire

GC University Lahore

HOUSEHOLD LEVEL POVERTY ASSESSMENT SURVEY IN RAVI ZONE

I am MS Geography student of GC University, Lahore and aims to conduct a research on poverty assessment in Ravi Town. This survey explores the poverty status among the projected area along with the determining factors which in turn will help to establish poverty alleviation strategies. Your contribution will make this effort possible and your provided information will be kept confidential

SURVEY INFORMATION

Questionnaire no.____ **Date:**_____ **Time Interview started**_____ **Time Interview ended**_____

GPS Points:_____ **UC:**_____ **Locality within UC:**_____

Respondent's Behavior: ☐ Cooperative ☐ Reluctant/Hesitant ☐ Non-serious ☐ Refusal

Language of Interview: ☐ Urdu ☐ Punjabi ☐ Others

HOUSEHOLD INFORMATION

1. Total no of household members_____

2. Family Structure: ☐ Joint Family System ☐ Nuclear Family system ☐ Any other please specify_____

3. Residential Status: ☐ Owned ☐ Rented ☐ Mortgage property

4. Head of Household: ☐ Male Headed Household ☐ Female Headed Household

If head of household is female then specify her marital status: ☐ *Married* ☐ *Unmarried* ☐ *Widowed* ☐ *Any other*____

HOUSEHOLD CHARACTERISTICS

Note: Please give the information about each household member who lives here

A) DEMOGRAPHIC DETAILS						**B) EDUCATIONAL PROFILE**		
No	**5. Relation with Head**	**6. Gender**	**7. Age**	**8. Marital Status**	Code for 6 Female =1 Male=2 Code for 8 Single=0 Married=1 Never married=2 Widow=3 Divorced=4	**9. Educational Status**	**10. In which type of educational institution he/she is going?**	Code for 9. Illiterate=0 Primary=1 Middle=2 Matriculation=3Inter=4 Graduate=5 Higher Education=6 Code for 10. Govt. =1 Private=2 Madras=3 NGO/Trust=4
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

11. Do any school going children aged 6-14 not going to School?

☐ No ☐ Yes (State how many_____)

If your answer is yes what are the reasons for not going to School?

☐ Education is costly ☐ Child is not willing ☐ Far away

☐ Helping in domestic purpose ☐ Helping in work

☐ Parents do not permit

ECONOMIC PROFILE

12. Occupational Structure/Income source (Specify the occupation of household head)_____

Occupation	Govt. job	Private job	Own business	Labor	Working as an employ in Industry	Pension Holder	Rental Income
No of persons							
Relation/Gender							

13. No of Earning and dependent members: Earning members_____ Depending members_____

Among earning members no of: Males _____ *Females*_____

14. No of unemployed members in family other than students_____

15. Specify the reason behind unemployment_____

16. Estimated monthly income_____ **rupees**

☐ Below 10,000 ☐ 10,001-15,000 ☐ 15,001-20,000 ☐ 21,000-30,000 ☐ 31,000-40,000 ☐ 41,000-50,000
☐ Above 51,000

17. Total Expenditure of household in a month? _____**rupees**

a) On Food items_____ b) On Transportation _____ c) On bills _____

18. Do you find household income enough to meet expenditure: ☐ No ☐ Not at all ☐ Yes

19. How many household members at present receive any benefit like:

☐ Income Support_____ ☐ Widow's benefit _____ ☐ Pension _____ ☐ Others (please specify)_____

18. Are you availing any poverty alleviation measure from government/NGOs? ☐ No ☐ Yes

19. Are you aware about the poverty alleviation measures? ☐ No ☐ Yes

HEALTH STATUS

20. Is any child died in the household under 0-5 years: ☐ No ☐ Yes (State number and reason_____)

21. Is any member in this household sick/ill ☐ No ☐ Yes (State number of sick members _____ age_____)

Did they consult for their illness? ☐ No ☐ Yes

If yes which type of health provider, they visit?

☐ *Private Dispensary* ☐ *Govt. Dispensary* ☐ *Hakeem* ☐ *Homeopathic* ☐ *One who perform DUM (spiritualism)*

If no, then why they didn't take treatment?

☐ *Costly treatment* ☐ *Not Required* ☐ *Far away* ☐ *Doctor do not present* ☐ *Unsatisfactory*
☐ *Untrained staff* ☐ *Others (please specify)*_____

22. Are you satisfied with the health facilities in your area? ☐ Yes ☐ No (Please specify)_____

HOUSING AND INFRASTRUCTURE INFORMATION

A) HOUSEHOLD STRUCTURAL INFORMATION

23. Size of your plot: ☐ 1-2 marla ☐ 3-4 marla ☐ 5-6 marla ☐ 7-10 marla ☐ 10 marla and more

24. Story of building: ☐ Single Storey ☐ Double Storey ☐ Triple Storey ☐ Four story and more

25.Age of Building: ☐ < 5 years ☐ 6-10 years ☐ 11-20 years ☐ 21-30 years ☐ 31-40 years ☐ > 41 years

26. No of rooms in household: _____

27. No of family members sleeping in one room:_____

28. Main Building Material of Building	**i. Main Material for roofs**	**ii. Main Material for floor**
☐ Brick	☐ wood/bamboo	☐ Earth/Sand
☐ Concrete	☐ Iron/Cemented Sheets	☐ Wood planks
☐ Wooden	☐ RCC/RBC	☐ Cement
☐ Others_____	☐ Others_____	☐ Ceramic Tiles
		☐ Polished Wood

B) WATER SUPPLY AND SANITATION

29. Source of Drinking Water:

☐ Piped water ☐ Public tap ☐ Hand pump ☐ Water motor ☐ Filtration Plant ☐ Mineral Water ☐ Water Tank ☐ Others

Do you have any problem with water supply? ☐ No ☐ Yes

What are the problems with water supply:

☐ Water cuts (how frequent___) ☐ Not Clean ☐ Low quality (hardness) ☐ Difficult to access ☐ Others_____

30. No of hours of water access? _____

31. No of toilets available in household? _____

32. What kind of toilet facility do your household members mostly use?

☐ Facility not available ☐ Dry raised latrine ☐ Flush system (linked to sewerage) ☐ Flush (linked to septic tanks)
☐ Flush connected to open drains ☐ Pit Latrine ☐ Others

33. How are the solid waste disposed?

☐ Municipality collects regularly ☐ Disposed irregularly ☐ Disposed to predefined landfill ☐ Burning ☐ Others

C) ENERGY USE

34. In your household which type of cook stove is mainly used?

☐ LPG Cooking gas stove ☐ Piped natural gas stove ☐ Others (Please specify_____)

35. What is the main fuel used for cooking in household?

☐ Gas ☐ Kerosene oil ☐ Coal ☐ Dung cake ☐ Others

36. Do you face any gas shortage in your area? ☐ No ☐ Yes (How frequent_____)

37. Do you have electricity in your household? ☐ No ☐ Yes

38. Do you experience any problem with electricity supply? ☐ No ☐ Yes

39. What kind of problems do you experience?

☐ Electricity cuts (how frequent_____) ☐ Low Voltage ☐ Others (Please specify_____)

D) ASSESTS IN POSSESION

Assets	Quantity	Assets	Quantity

Car / Truck		Washing machine	
Motorcycle		Stove with oven	
Air conditioner		Refrigerator	
TV		Phone	

AREA INFORMATION

A) FACILITIES AVAILABILITY IN AREA

Available Facilities	**Accessibility**
Educational institutes ☐ No ☐ Yes	☐ Satisfied ☐ Not Satisfied ☐ Household children not go to area institutes
Banks ☐ No ☐ Yes	☐ Satisfied ☐ Not Satisfied
Police Station ☐ No ☐ Yes	☐ Satisfied ☐ Not Satisfied ☐ Never used
Hospitals/Clinics ☐ No ☐ Yes	☐ Satisfied ☐ Not Satisfied
Recreational Activities ☐ No ☐ Yes	☐ Satisfied ☐ Not Satisfied

40. How satisfied are you with this area as a place of living?

☐ Very Satisfied ☐ Fairly Satisfied ☐ Neither satisfied nor dissatisfied ☐ Slightly Dissatisfied ☐ Very Dissatisfied

B) CRIME RATE

41. How do you rate the crime in your area?

☐ High crime ☐ Medium crime ☐ Low crime

42. Which type of crime is mostly prevail in your locality? _____

43. Are you satisfied with the security condition of your locality? ☐ Satisfied ☐ Not Satisfied