

Poverty Status in Pakistan-New Insights from Intensity of Poverty

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Abstract

The deeper face of poverty profile is needed to be examined for the better execution of poverty elevation programs and to reduce inequality. The analysis of intensity of poverty is worthwhile in this regard. The cut-off of the AF (Alkire Foster methodology) enables to zoom in and zoom out the deprivation profile of poor people. By utilizing the cut-off and the weighted deprivation score this study has computed the range of k (cut-off of the Alkire Foster methodology) and computed the intensity of poverty within poor. This study depicts the deeper analysis of intensity of poverty in Pakistan by depicting moderately poor, extremely poor and vulnerable population according to the possession of MPI (Multidimensional Poverty Index) indicators. According to 2019-20 intensity estimates each individual is on average deprived of 45.6% of the weighted indicators in rural Pakistan. The study computed some interesting results within non-poor population as well. The results showed that 9.24 percent of the population among non-poor has access to all the basic indicators of three dimension in 2019-20. This percentage is only 2.6 percent for rural Pakistan. Moreover, 13.2 percent of population has escaped from being vulnerable to poverty between 2014-15 and 2019-20. The proportion of moderately poor is high in urban areas and that of extremely poor's is high in rural areas. Further, severely poor people are mainly facing educational deprivations.

Key Words: Poverty measurement, Multidimensional Poverty, Deprivation, Vulnerable Population

JEL Codes: I3, I32, D63, D3

1. Introduction

Poverty is the foremost barrier for the achievement of sustainable growth. It has now been globally recognized that poverty is not only a monetary concept rather it has non-monetary dimensions as well. The pioneer work for the presentation of well-being as the multidimensional concept goes back to Sen (1985). In its multidimensional nature, "poverty causes all social and human ills capable of constraining the abilities of man and making him think of just mere existence" (Chukwuma, 2013). The target of first SDG is

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to reduce poverty in all its forms. The goal is targeted to be achieved by reducing the proportion children, men and women by at least half and by the implementation of suitable social protection measures for all the residents by 2030 (Cheng et al., 2018). The accurate estimates of human deprivations are crucial for the implementation of right policies.

Multidimensional poverty is being globally estimated using the AF measure of poverty (Alkire and Foster, 2011). The MPI (Multidimensional Poverty Index) proposed by Alkire and Foster measures the joint distribution of deprivations, is a combination of Headcount Index and the Intensity of Poverty, which shows the “the percentage of weighted indicators in which the average poor person is deprived” (Alkire and Santos, 2010). Including the global Multidimensional Poverty Index (2021), which measures the MPI for 109 countries in the developing world², numerous studies have estimated the MPI for different countries of world (Adepoju, 2018; Hanandita and Tampubolon, 2016; Yu, 2013 etc.). However, the intensity of poverty is seldom been discussed in detail. The headcount is unable to measure progress among poor (Martin et al., 2020). Therefore, the incorporation of intensity of poverty (unlike the counting base headcount ratio), is important for designing poverty alleviation policies (Alkire and Apablaza, 2016). Studies have also experienced that, although the overall MPI has declined over the years, however, the intensity of poverty hasn't declined much (Wardhana, 2010; Alkire et al., 2021).

The multidimensional measurement of poverty estimation has entered from academic discussion to policy debate, as many countries have adopted multidimensional measures for official estimates (Freirra and Logo, 2013). There is a keen interest of policy makers and analysts

that how to best summarize various deprivations of multidimensional poverty which are useful for policy recommendations. For the development of policies to address the

² The population of 109 countries represents the three quarters of the world's population. The 2021 estimates showed that 21.7% population of these three quarters is multidimensionally poor.

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specific deprivations, the analysis of intensity of poverty is worthwhile. Its estimates can be used to view those who are suffering from the greatest breadth of deprivation (Alkire and Santos, 2014; Alkire and Foster, 2011) and can be used to formulate policies (Alkire and Santos, 2010). On the basis of intensity thresholds, people can be classified as moderately poor, vulnerable to poverty or in severe poverty (Kovacevic and Calderone, 2014). In this context, this paper is an attempt to view the concept of multidimensional poverty in a slight different manner by considering the intensity of poverty rather headcount. Owing to the importance of intensity estimates this paper estimates the intensity of poverty, using Pakistan as a Case Study. The research focuses on the proportion and determinants of moderately, extremely and vulnerable multidimensional poor population by computing weighted deprivation score from the Alkire-Foster methodology using Pakistan as a Case study.

According to World Bank's 2021 estimates showed that in Pakistan has increased from 4.4% (2019) to 5.4%. According to National Poverty estimates 21.9% people were found to lie below poverty line.³ The Multidimensional Poverty was estimated in Pakistan in 2014-15 by UNDP in collaboration with Planning Commission of Pakistan. In the recent PSLM (Pakistan Social and Living Standard Survey) 2019-20, the district wise situation analysis is carried out for the specific indicators of Health, Education, Living Standard and Information Technology, for the assessment of performance of indicators in specified dimensions. For the deeper assessment of poverty profile of people this paper estimates the intensity of poverty using Alkire-Foster Methodology for PSLM 2014-15 and PSLM 2019-20. On the basis of intensity estimates, the study presents the deep analysis of poverty status by specifying not only moderately poor, extremely poor, non-poor but also vulnerable population. The paper presents the systematic analysis of reductions in poverty status from 2014-15 to 2019-20. Using the Multinomial Regression estimates the paper also presents the determinants of poverty status in 2019-20. The rest of the paper is divided as, Section-2 for literature review, Section-3 for methodology and Section-4 for data and estimation results.

³ Cost of Basic Need Approach (Planning Commission of Pakistan)

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2. Review of Literature

Wardhana (2010) worked on the multidimensional poverty in Indonesia using four rounds of Indonesian Family Survey. The results witnessed the considerable reductions in incidence of poverty rather intensity of poverty (Incidence fell from 32% 1993 to 8% 2007, intensity was measured around 40%). Housing quality and asset holding were found to be dominant indicators in poverty. Runsinarith (2012) attempted to measure changes in the determinants of poverty in Cambodia for panel data for three years (2001, 2004 and 2008). The study measured poverty using adult equivalent per head expenditure for non-food and food items. The results from Multinomial Logistic regression indicate that aged household heads and dependency ratio push households into poverty. Moreover, an increase in per capita asset and agricultural land reduces the risk of being chronically poor.

The Chinese Nutrition and health survey for 2000-2009 was utilized by Yu (2013) for poverty measure. The study adopted Alkire-Foster measure and income, health, social security and education as dimensions. The findings revealed the considerable reductions in income and multidimensional poverty (with respect to intensity and headcount) over the decade. However, vast differences were found at regional and provincial level. Rural areas exhibited 1.5 times higher poverty as compared to urban ones. The study suggested to focus on education for the development of deprived regions. Acar (2014) measured multidimensional poverty in Turkey using housing, health, labour market and living standard and education as dimensions. Study used data from Income and Living Condition survey 2007-2010. The estimation of an index showed that poverty has declined in the period under consideration. The results from random effect probit model explored that years of schooling, asset income and home ownership decrease the chances of falling into a poverty trap. However, the increase in employment in agricultural sector and household size increase the risk of falling into the poverty trap.

Hanandita and Tampubolon (2016) examined trends in poverty in Indonesia from 2003 to 2013 using National Socio-economic Survey. Alkire-Foster measure used consumption poverty, health and education as dimensions. The results witnessed the reduction in poverty overall and at sub-national level, over the specified period

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irrespective of weights or poverty cut-offs. Adepoju (2018) focused on the multidimensionally poor people in Nigeria. The study employed Alkire-Foster measure of poverty on General Household Survey-Panel data 2011 and 2012. The results

showed that poverty is mostly contributed by education and asset holding in Nigeria. Marital status, land ownership, number of assets and household size significantly affect chronic poverty in Nigeria.

Sahin and Kihc (2021) computed the determinants of transitory and chronic income poverty using Multinomial logistic regression in Turkey. Study utilized the Income and Living Conditions Survey covering the period 2014-2017. The findings suggested that the home ownership, regular job and number of children are important determinants of chronic and transitory poverty. Wang and Zhang (2021) measured poverty among rural residence in China using longitudinal survey from 2010 to 2018. The results indicated that the incidence of multidimensional poverty has declined drastically over the specified period. However, intensity of poverty showed mild reduction. Moreover, education has the highest contribution in multidimensional poverty among all the indicators.

Alkire et al., (2021) analyzed the variations in multidimensional poverty in India for 2005-06 and 2015-16. The study suggested that headcount index is unable to capture the required deprivations to monitor the developments in SDGs (Sustainable Development Goals) The more accurate analysis demands the use of adjusted headcount ratio instead of traditional headcount. The poverty measurement among the sample of 271 million showed that poorest of poor population showed the largest reductions in intensity of poverty in India. Tran et al., 2022 attempted to analyze the determinants of poverty in Vietnam using multilevel regression. The results showed that social capital, education and employment are among the important factors to influence multidimensional poverty. Like all other countries, the probability of being poor is high for the population of rural areas. Macroeconomic indicators that influence poverty are higher international integration and economic development.

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The review of existing literature on multidimensional poverty revealed that it mainly covered the poverty measurement and its determinants. The intensity of multidimensional poverty is seldom discussed in literature, which actually depicts the deeper face of poverty profile. It shows the poverty status of poor's and also the deprivations of non-poor population. The poverty status (moderately and extremely poor) in case of multidimensional poverty measurement is presents clear picture for policy makers to for the implantation and monitoring of policies. The analysis of

intensity of poverty from Alkire-Foster index depicted in this paper also depicts the vulnerability of multidimensional poverty.

3. Methodology

The Alkire-Foster measure of poverty is the product of Headcount Index (H) and the intensity of poverty (A)

$$MPI = H \times A$$

H is obtained by $H = \frac{q}{N}$.

The intensity 'A' shows the "the percentage of weighted indicators in which the average poor person is deprived".

$$A = \sum_{i=1}^N c_i(L)/n$$

And $c_i = \sum_{k=1}^K w_k I_{ki}$

The deprivation score of people is summarized by vector c , I_{ki} takes two values 1 for deprivation in the respective indicator and 0 otherwise. The cut-off (denoted by k) for overall poverty level is the proportion of weighted deprivations experienced by poor. The Table A2 in the Appendix lists the indicators and cut-offs of the MPI.

3. Data and Methods

3.1. Data Source

The study utilizes three waves of PSLM which are 2004-05, 2014-15 and 2019-20. The sample size for 2004-05, 2014-15 and 2019-20 is 73345, 78635 and 195000 households

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respectively. The latest PSLM survey is one of the biggest data set which covers 6500 blocks and 195000 households.

4. Analysis and Discussion

4.1: Regional and Provincial Estimates of MPI:

The calculated MPI using Alkire-Foster Methodology is shown in Table-1. The headcount has declined from 56.1% to 22.6% from 2004-05 to 2019-20 respectively. However, the intensity of poverty has been reduced by 6.2% from 2004-05 to 2014-15. MPI has reduced substantially over

the 14 years. 10.2% of population have been found to be multidimensionally poor in 2019-20. The declining trend in multidimensional poverty has been globally witnessed. But in most of the developing countries the decline can only be seen in terms of headcount index. Wang and Zhang (2021) has also witnessed the decline in headcount index rather intensity in rural China.

Table 1: Multidimensional Poverty Measurement for Pakistan (PSLM 2004-05, 2015-14 and 2019-20)

	2004-05	2014-15	2019-20
Headcount Index	56.1	38.0	22.6
Intensity (A)	51.4	50.4	45.2
MPI	28.8	19.0	10.2

Authors' own calculations using PSLM

The rural urban profile shows that poverty is substantially lower in urban areas as compared to rural areas. However, the notable difference is found in headcount index rather intensity of poverty. MPI has remarkably declined in urban areas during the specified period (16.8% to 3.2%).According to the 2019-20 intensity estimates, each individual is on average deprived of 45.6 and 41.9 percent of the weighted indicators in rural and urban areas respectively.

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Table 2: Multidimensional Poverty Measurement for Pakistan Rural and Urban Regions (PSLM 2004-05, 2015-14 and 2019-20)

	Rural			Urban		
	2004-05	2014-15	2019-20	2004-05	2014-15	2019-20
Head Count Index(H)	65.9	53.2	31.2	35.3	8.8	7.7
Intensity(A)	52.4	51.1	45.6	47.5	42.9	41.9
MPI(M0)	34.5	27.2	14	16.8	4.0	3.2

Authors' own calculations using PSLM

The province wise break down of MPI shows that in 2019-20 MPI is lowest in Punjab, followed by KP, Sindh and Baluchistan, Education (41.9%) is appeared to be the dominant dimension in

contribution to poverty in 2019-20 followed by Living Standard (39.7%) and Health (16.06%). (Appendix-I, Table-A1)

4.2. The Intensity of Poverty in Pakistan-2014-15 and 2019-20-Breakdown of Weighted Deprivation Score

Studies defined chronically and Transitory Poor People (using panel data) in Multidimensional poverty analysis (Alkire et al., 2017) and income poverty as well (Kihic and Sahin, 2021, Rodriguez et al., 2015). Alkire-Foster Methodology is based upon dual cut-off criteria (Alkire et al., 2011). Studies estimated poverty by changing the cut-off (minimum $k=0.33$; see the methodology section) to view the distribution of moderately and extremely poor. It can be used to view those who are suffering from the greatest breadth of deprivation. If we report two values of k say $k=2$ and $k=3$, we consider household be multidimensionally poor if deprived off at least 20 percent and 30 percent of the weighted indicators respectively. Since k is a policy variable (Alkire and Santos, 2010) its distribution must be examined to view the deprivations of the poorest of the poor. The choice of k is normative, and is up to the researcher. The minimum value of

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k usually taken to consider household multidimensionally poor is 0.33 (Alkire and Foster, 2011). The poverty cut-off k is further break downed to view the distribution of population who is vulnerable to poverty, moderately poor and extremely poor. We have computed the range of 'k' and computed the intensity of poverty within poor. The intensity of poverty is obtained within poor and non-poor using weighted deprivation score c_i .

Non-Poor: The weighted deprivation score '0' is for those who are not only non-poor but are non-deprived in all indicators of MPI.

Non-Poor with Moderate Deprivations: The weighted deprivation score '0' is for those who are not only non-poor but are non-deprived in each of the indicator of poverty.

Vulnerable to Poverty: The household with weighted deprivation score 0.33 is considered to be poor. If a household is scoring closing to 0.33 it implies that it is vulnerable to poverty. Vulnerability is defined as the score ranges from 0.27-0.32.

Moderately Poor: The range of deprivation score 0.33-0.45 for those who are 'Moderately Poor'. **Extremely Poor:** 'Extremely Poor' are defined as those who are facing more than 45 percent but less than 60 percent of the deprivations.

Severely Poor: The deprivation score higher than 60 percent means that people are deprived off at least 60 percent of the indicators, it represents the severe deprivation.

Table-3 shows the profile of poor and non-poor population and its breakdown at regional level. 9.24 percent among the non-poor are non-deprived in all indicators as compared to 7.2 percent in 2014-15. In other words, in the given representative sample 9.24% of population has access to all the basic indicators of three dimensions in 2019-20. In rural areas only 2.6% of population has 0 deprivation score. It shows that people only few percentage of population has access to all basic needs, showing the vast economic inequality. The MPI has decreased from 19 percent to 10 percent between 2014-15 and 2019-20. However, proportion of people among non-poor with access to all indicators only increased by 2 percent (note that these indicators represent the minimum acceptable living conditions). These results indicate that the reduction of MPI can't be considered as the improvement of living standard of people.

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Table 3: Poverty Status Overall and at regional Level

	2014-15			2019-20		
Poverty Status	Pakistan	Rural	Urban	Pakistan	Rural	Urban
Zero Deprivation	7.21	1.6	20.4	9.24	2.59	20.9
Non-Poor with moderate deprivations	60.5	57.9	66.5	71.6	72.3	70.3
Vulnerable	29.8	37.4	11.9	16.6	21.6	7.75
Moderately Poor	39.1	37.6	67.2	60.3	55.7	72.1
Extremely poor	37.9	38.5	26.8	32.7	36.1	23.8
Severely Poor	23.2	24.1	6.97	10.8	11.5	4.34

Authors' own calculations using PSLM 2014-15 and 2019-20

The estimates showed that 13.2 percent of population has escaped from being vulnerable to poverty between 2014-15 and 2019-20. Among the poor population the proportion of moderately poor is highest for both years, the proportion is increased from 39.1% to 60.3% from 2014-15 to 2019-20 respectively. It shows that, although overall poverty has declined in six years, however, the proportion of moderately poor population has increased considerably. On the other

hand, the reductions can be seen in severely poor masses between 2014-15 and 2019-20 (23.8 percent to 10.8 percent). However, in rural areas the percentage of extremely poor's only reduced by 2.4%. Alkire et al., 2021 showed that poorest of poor population showed the largest reductions in intensity of poverty in case of India between 2005-06 and 2015-16. Our results also show that the proportion of moderately poor is high in urban areas and that of extremely poor's is high in rural areas.

This distribution of intensity of poverty shows that the decline in the number of poor population shouldn't be the main concern of the policy maker. The deeper face of people poverty profile needs to be examined for the better implementation of poverty reduction policies. Among the poor population the percentage of people having 40 to 50 percent of deprivations is highest. Severe poverty has reduced to some extent, however,

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poor falling in middle of the distribution needs to be targeted. The raw headcounts of those people who have weighted deprivation score, more than 50 percent (Extremely poor plus Severely Poor) showed that the highest deprivation appeared to be in cooking Fuel, followed by Education Quality and School Attendance⁴. It indicates that poorest are mainly facing educational deprivations. It is quite possible that if efforts are initiated to lessen educational deprivations they may perform well in other dimensions.

4.3. Multinomial Logit Estimation Results

The dependent variable for the Multinomial Model is “Poverty Status”, for which there are four possible outcomes. 1 is for those who are Non-Poor, 2 is given when household is vulnerable to poverty (as defined in previous section). 3 is for Moderately Poor and 4 is assigned for Extremely Poor (Severely poor + extremely Poor)⁵. The estimation results from Multinomial regression needs to be explained with caution. In these models the sign and probability don’t have one to one correspondence. Preferably, the coefficients must be interpreted using odd ratios or probabilities (Cameron and Trivedi (2005), Escobar et al. (2010)). The marginal effects, alternatively can be used for the interpretation of multinomial regression results. We have computed Marginal effects for the four categories.

For the results presented in Table-4, the base category is ‘1’ depicting Non-Poor. The model shows that 21.01% variations in the deprivation score profile of poor’s is explained by the independent variables. This estimate is reasonable in case of cross-sectional data (Paudel et al., 2018). The findings revealed that household size positively affects poverty status at 1% level of significance indicating that in already deprived household with an additional household member the severity of poverty also increases. It is obvious that larger households are more likely to be poor due to increased demand for food and non-food items. These finds are in line with Arif and Bilquees (2006) and Adepoju (2013). The coefficient for secondary education variable is negative for all the categories, indicating that education reduces the chances of falling into the poverty trap. The increase secondary education decreases the chances of being vulnerable to poverty

⁴ The censored headcounts for all indicators are not reported in estimation results.

⁵ For the multinomial regression estimation the categories are reduced from 6 to 4, to avoid complications in the interpretations of results.

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and being moderately poor by 4 and 8 percentage points respectively. Earlier studies have also found that educated household heads are more capable of escaping poverty. These findings are in line with that of Wu et al., (2008) and Imai and You (2013). Tilak (2002), Bigsten and Shimeles (2003), Acar (2014) and Chapoto et al., 2011 also confirmed that educated household heads are more likely to exit poverty. The coefficient for primary education is negative and significant for first two categories of poverty status, and negative for 3rd category. However, contrary to expectations the coefficient of higher education is positive for all three outcomes of dependent variable.

Table 4: Multinomial Logit Estimates: The Average Marginal Effects

	Vulnerability	Moderately Poor	Extremely Poor
Primary Education	0.004**	-0.01**	-0.02
Secondary Education	-0.01	-0.04	-0.08
Higher Education	0.004	0.019	0.011
Gender	0.005	0.006	0.014
Married	-0.01	0.003	0.012
Age of Head	-0.02	-0.01	0.004
Foreign Remittances	-0.008	-0.026	0.029**
Female Head	0.004**	-0.05	0.04
Household Size	0.006	0.015	0.018
Asset Holding	0.043	0.129	0.156

1=Non-poor, base Category **Insignificant

The probability to be vulnerable to poverty will decline by 5 percent if household is female. However falling into the trap of severe poverty increases by 4 percent when head is female. The weighted deprivation score associated with severe poverty is more likely to increase if household is headed by female. It implies that when head is female the severe poverty is more likely to be the case, these results are supported by Rodriguez et al., (2015). The accumulation of assets by households make people better off and reduces the chances of being falling into the trap of extreme poverty and being vulnerable to

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poverty. These findings are supported by Imai and You (2013) and Heggness (2013). The results also show that when household head is married it is difficult to escape poverty.

5. Conclusion and Policy Recommendations

The present article has estimated the MPI in Pakistan using three waves of PSLM (2004-05, 2014-15 and 2019-20). The study defined the vulnerable to poverty, moderately poor and extremely poor on the basis of multidimensional poverty. The weighted deprivation score calculated from Alkire-Foster methodology has been utilized to compute the intensity of poverty. The results show that only 9.24 percent of non-poor population have access to all the basic indicators. It shows that non-poor population is also vulnerable to poverty in Pakistan, depicting the depth and severity of poverty in Pakistan that cannot be estimated using Headcount index. Although, the MPI has declined from 19% to 10% from 2014-15 to 2019-20. However, the proportion of non-poor with access to all basic indicators declined by only 2%. It shows that the multidimensional estimates of poverty should be examined deeply for better policy decisions. Moreover, among the poor population the proportion of poor facing the worst deprivations is highest. It is the indication for policy makers to focus on the poorest segment of society rather than following uniform policy actions. People deprived off more than 50% of the indicators need more attention. The educational deprivations are highest among the poor population. The results revealed that educated households are more likely to escape poverty. It directs the policy makers to increase accessible and cheap educational facilities to reduce the intensity of poverty.

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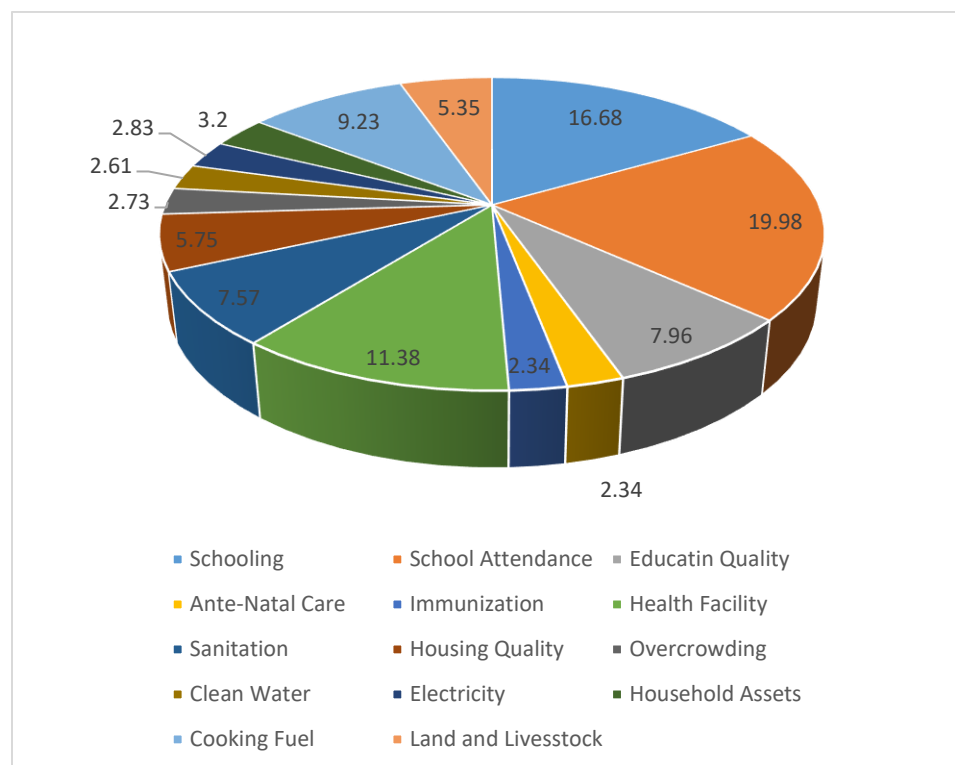
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Appendix

Table-A1: Multidimensional Poverty Measurement for Pakistan Province-2019-20

	KP	Punjab	Sindh	Baluchistan
Head Count (H)	35.4	13.7	27.57	47.3
Intensity (A)	46.5	42.9	45.61	47.3
MPI(M0)	16.5	5.90	12.57	22.4

FigureA1: Percentage Contribution to MPI-2019-20



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Table A2: Dimensions, Indicators/variables, weights and Cut-offs:

Dimension	Indicators	Deprived if	Weights
Education	Schooling	No one in family (age higher than 12 years) possesses	17%
	Child Attendance	Any of the school aged child is not attending school	12.5%
	Education Quality	Any child is out of school due to some reasons (education is expensive, too far furlong, poor quality of schools etc.)	4.2%
Health	Access to health facilities	The household will be deprived if hospital/clinic is more than 30 minutes away from home (through transport)	22%
	Immunization	If any child under 5 is not fully immunized	5.56%
	Ante-natal care	Any woman having child didn't received any ante natal care in last three years	5.56%
Living Standard	Water	Household has no access to clean water according to MDGs standards	4.76%
	Sanitation	Household has no adequate sanitation facilities according to MDGs standards	4.76%
	Wall	Household has unimproved walls (e.g. mud/mud brick etc.)	4.76%
	Overcrowding	Household has more than 4 people per room	2.38%
	Electricity	Household has no electricity connection	4.76%
	Cooking Fuel	Household used solid fuels for cooking e.g. dunk cakes, wood, coal etc.	4.76%
	Assets	Household doesn't possess more than to small assets (fan, TV, radio, etc.) OR no large asset (tractor, computer, refrigerator, motorcycle, air conditioner) AND has no car	2.38%
	Lives Stock and Land Holding (Only for rural areas)	Household has no land and livestock, [Urban households assumed non-deprived]	4.76%