

Correlates of Multidimensional Poverty in Rural Punjab

Kiran Mustafa

Lecturer Economics, Abbottabad University of Science & Technology (AUST)

Muhammad Siddique

*Assistant Professor, Economics at government postgraduate College No. 01 Abbottabad,
Pakistan*

Muhammad Kashif Irshad

M.Phil Scholar (Economics) Hazara University Mansehra, Pakistan.

Mazhar Ali Abbasi

M.Phil Scholar (Economics), Hazara University Mansehra, Pakistan.

Muhammad Muddassar Khan

Lecturer, management Sciences department, Abbottabad University of Science & Technology

Abstract

The study attempts to estimate different dimensions of poverty for the rural areas of Punjab by utilizing the HIES dataset for the year 2011-12. The study measures the unidirectional and multidimensional aspects of poverty for rural Punjab. It also examines the impact of different socio-economic variables on poverty by using logit regression model. Results show that unidimensional poverty is low in rural Punjab except few areas of Multan and D.G. Khan whereas multidimensional poverty is very high due to unavailability of basic necessities of life and basic services

Keywords: Poverty, Multidimensional, Unidimensional,

Introduction

Poverty is a universal and highly debated issue faced by all parts of the world with varying intensity. It has received a great deal of attention by the policy makers and researchers all over the world. Poverty has always been remained a central and essential discourse on development. In this context, researchers acquainted with profuse frameworks and concepts to address poverty. However, some common concepts surfaced that appear to be the cause of persistent poverty, (Zahra & Zafar, 2015). Traditional definition of poverty is based on the lack of income. However, with the passage of time it is realized that poverty is not a uni-dimensional phenomenon, (Salahuddin & Zaman, 2012).

Multidimensional poverty index is based on two key concepts. First, it includes people living under conditions where they do not reach minimum standards which are internationally agreed as indicators of basic functionings. For instance, being well nourished, being educated or being able to have access to clean drinking water. Second, it includes people living under deprivations that is, a condition where they do not reach the minimum standards in several aspects at the same time, (UNDP, 2015).

There are about 900 million extremely poor people across the globe, in 2012, according to the updated poverty line of \$1.90 per day, which equals 12.7 percent of total global population. The projected acute poverty for 2015 was about 700 million people. It means that about 200 million people expected to be out of extreme poverty in 2015. It was projected that 35.2 percent people will be extremely poor in Sub-Saharan Africa in 2015, which is less than 42.7 percent in 2012. The second highest projected poverty is for South Asia of 13.5 percent in 2015. It means that out of 700 million projected poor in the world, about 578 million extremely poor exist in Sub-Saharan Africa and South Asia, (Bank, 2015).

In recently released Millennium Development Goals Report of 2015 highlight that 836 million people are still falling in the extreme poverty in 2015 which is falling from 1.9 billion compared to 1990. From 1991 to 2015, the number of people in working middle class nearly

tripled based on more than \$4 a day. Similarly the proportion of undernourished people and out of school children of primary school age dropped by almost half since 1990 and 2000 respectively, (UNDP, The Millennium Development Goals Report 2015, 2015).

In spite of reduction in poverty worldwide, the pace of poverty reduction is not equal in all the regions. South Asia and Sub-Saharan Africa is facing menace of extreme poverty. As the recent development on poverty measures has been improved, there is a need for appropriate identification of poverty across the various dimensions in Pakistan and rural Punjab in particular. Since there is a lack of comprehensive estimation of poverty in the light of newly introduced techniques of measuring poverty in Pakistan and particularly in rural Punjab, therefore, the present study is an attempt to report poverty corresponding various dimensions of poverty in Punjab for the most latest available data of household integrated economy survey (HIES) for the year 2011-12. As poverty is basically a rural phenomenon in Pakistan as described by Arif and Farooq (2011), therefore rural Punjab is selected as a case study.

Literature Review

Salahuddin and Zaman, (2012) utilized Alkire – Foster Multidimensional (AFM) poverty methodology to structure time series trends of poverty in Pakistan from 1998 to 2006. They concluded that multi-dimensional poverty estimates provide more accurate picture of poverty in the country. The empirical results revealed that poverty in Pakistan has highly deprived the people in education and health. However, poverty based on access to education is worst even though education is the key to capabilities development.

Zahra and Zafar (2015) studied determinants of multidimensional poverty among the Christian community in Lahore. They used Alkair and Foster technique for poverty measurement. Results show that most of the respondents are engaged in the low skilled jobs due to lack of access to education and remain less competitive in the labor market. They suggested that growth can be more inclusive if education and skill development programs are initiated for these marginalized people.

Khan, A. K., Saboor, A., Hussain, A., Sadiq, S., & Mohsin, (2014) analyzed the incidence of multidimensional poverty at regional levels in the Sindh Province of Pakistan from 1998-99 to 2007-08. They utilized the deprivation of education, health and housing facilities as demension of poverty. They concluded that magnitue of multidimensional poverty varies significantly across the regions of Sindh Province. However, magnitude of poverty is higher in rural areas as compared to urban areas.

Haroon (2009) assessed the extent of household vulnerability to poverty in Pakistan. He utilized Household Integrated Economic Survey (HIES) data for the period of 2000-01 and 2004-05. The estimated results showed that about 52 percent population was vulnerable to poverty during 2004-05. Moreover, he concluded that monetary poverty has been reduced during the study time period but relative incidence of vulnerability has been increased to 52 percent in 2004-05 from 50 percent in 2000-01.

Sial et.al (2014) utilized Pakistan Social and Living Standard Measurement (PSLM) survey data of 2005-06 and 2010-11 to measure poverty and inequality in Pakistan. They used equivalent per adult expenditures, enrolment and maximum years of schooling, facilities like gas, electricity and safe drinking water etc. they concluded that education and health are the major drivers of poverty. At the same time, income inequality has been reduced, however, inequality in access to health facilities have been increased in Pakistan.

Arif and Farooq (2011) studied the overall employment situation along with growth – employment – poverty – inequality nexus. The study revealed that poverty and inequality moved in opposed direction in both high growth decade of 1960s and low growth decade of 1970s. High growth during 1980s, poverty dropped significantly with a mild rise in income inequality. However, poverty increased with decrease in inequality due to fall in growth in

1990s. It shows how complex is the relationship among poverty, inequality and growth in Pakistan.

Nazli et.al (2015) estimated poverty trend for the period of 2001 to 2011 using official food energy intake and the cost of basic need approach. They reported much larger poverty estimates than the official estimates. They concluded that poverty incidence in fact increased rather decreased.

Objectives

The present study is based on the following objective

- To access the effect of uni-dimensional and multidimensional poverty in rural Punjab
- To examine the linkages between poverty and other demographic variables

Materials and Methods: For the measurement of pragmatic result collection of the appropriate methodology is an important step of research. The study in hand evaluates the extent and correlates of the dilemma by employing Foster Greer and Thorbecke (FGT) (1984) and Alkire and Foster (2009) indexing approaches with a logistic regression model. The information needs to enumerate results are collected from a Household Integrated Economic Survey, known as HIES, datasets of the year 2011-12.

Procedure of Uni-dimensional Poverty: Foster Greer and Thorbecke (FGT) (1984) method is applied for the implication of uni-dimensional poverty and utters an individual or household poor if who is not accomplishing the minimum threshold level of income/ expenditure that is necessary for the subsistence of life. The threshold used for given study is Rs=1937 that is inflated by using Consumer Price Index of year 2011-12. Three basic measures of poverty headcount ratio, poverty gap ratio, and squared poverty gap ratio are discussed in such class of poverty. The general class of given measure is as follow:

$$FGT = \frac{1}{N} \sum_{i=1}^q \left[\left(\frac{z_i - y_i}{z_i} \right) \right]^\alpha$$

Here Z_i denotes the poverty line and Y_i is the income/ expenditure of poor individual or households, α takes different value like 0, 1, 2 for the measurement proportion extent and severity of poverty.

Procedure of Multidimensional Poverty: FGT is the traditional measure of poverty which discussed poverty in the uni-dimensional model but currently poverty is studied in multidimensional perspective and estimated by applying Alkire and Foster, (2009) approach, under such approach three basic indexes are calculated that are adjusted headcount ratio, adjusted poverty gap ratio and adjusted squared poverty gap ratio.

Adjusted Headcount Ratio: According to Alkire and Foster (2009), adjusted headcount ratio is measured by the multiplying number of deprived individual or household in different dimensions “H” with average deprivation gap “A”. Mathematically it is written as $M_0=HA$ where $H=q/n$ and $A= \sum_i (c_i^*/ d)/q$.

Adjusted Poverty Gap Ratio: It quantifies the depth of poverty in multidimensional mode and is measured as the product of M_0 and G . Here G is the average standardize gap of deprived across all dimension which mathematically measured as: $G = \sum_{i=1}^q \left(\frac{Z - y}{z} \right)$ where z is the proposed dual cut off and y is the sum of deprivation in different dimensions. Standardized form of Adjusted poverty gap is as given $M_1 = M_0 G$

Adjusted Squared Poverty Gap Ratio: It quantifies the severity of poverty and is estimated by taking product of Mo, G, and H where H is the square of the average standardized gap of deprived across all the dimensions and mathematically calculated as

$$G = \sum_{i=1}^q \left(\frac{Z - y}{z} \right)^2. \text{ Standardized form of adjusted poverty gap is as given } M_2 = M_0 G H$$

Dimensional Structure of the Problem Under assessment: Selection of proper dimension is an essential step of research. The problem under assessment reviewed different studies like (Khan et al, 2011), (Alkire and Foster, 2009), (Chaudhry, Malik and Hassan, 2009) and (Salahuddin and Zaman, 2012) for the selection of essential dimensions.

Table1: Dimensions and Sub-dimension along with cut off

Dimensions	Sub-dimensions	Cut-off
Income	Uni-dimensional	If Income is < than Poverty Less then 1, otherwise 0.
Education	Year of Education	If the highest class is <=6 than 1, otherwise 0.
	Read	If cannot read in any language
	write	If cannot write in any language
Health	Pre-natal	If did not go to any pre-natal consultation than 1, otherwise 0.
	Post-natal	If did not go to any post-natal consultation than 1, otherwise 0.
	Purity of water	If Source of drinking water is not piped than 1, otherwise 0.
	Safe Sanitation	If flush is not connected to sewerage than 1 otherwise 0.
Housing & Services	Occupancy Status	If not owned than 1, otherwise 0.
	Electricity	Absence of Electricity Connection than 1, otherwise 0.
	Telephone	Absence of Telephone Connection than 1, otherwise 0.
	Gas	Absence of gas Connection than 1, otherwise 0.
Facilities	Refrigerator, Collar	
	Air Conditioner	Absence of both of them than 1, otherwise 0.
	Washing Machine	Absence of washing machine than 1, otherwise 0.
	T.V ,Cooking Stove	Absence of both of them than 1, otherwise 0.

Sources: Author’s own sources.

After selection of vital dimensions dual cut-off process is applied to measure poverty. In the given method first cut-off is applied within the dimension to measure deprive and non-deprived and after summing these deprived and non-deprived dual cut-off is applied to consider an individual or households poor and non-poor.

Logit Regression Model: Due to qualitative features of dependent variable logit regression model is applied as an econometrics technique to analyze the impact of different socio-economic variables on poverty. The general form of logit regression model is as follow:

$$Logit(P_i) = \ln\left(\frac{P_i}{1 - P_i}\right) = \beta_0 + \sum_{j=1}^k \beta_j X_{ij} + \mu_i \quad (\text{Asteriou and Hall, 2011})$$

Where p/1-p measure the response of event occurrence and non-occurrence and known as odd ratios. Their natural log gives the value of the coefficient of the logit model. The general form of odd ratios is as follow:

$$\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \sum_{j=1}^k \beta_j X_{ij} + \mu_i$$

Here β 's are the slope coefficient and intercept of the model, X_i represents the variables of the model and μ_i described as an error term of the that are used in the model.

Results and Discussion

The current study used all available resources to investigate uni and multidimensional poverty in rural Punjab. Alkire and Foster, (2009) and Foster Greer and Thorbecke (1984) methods are applied as indexing tools to investigate the extent of problem. The results of both measures are given below in Table:

Table: 2 Uni and multidimensional poverty in Rural Punjab

Divisions	Uni-Dimensional Poverty			Multidimensional Poverty			
	HCR	PGR	SPGR	H ₀	M ₀	M ₁	M ₂
Rawalpindi	3.87	0.45	0.120	86.10	46.10	24.40	15.10
Sargodha	11.11	1.36	0.277	96.30	54.90	29.80	19.90
Faisalabad	7.11	0.19	0.913	93.20	53.50	31.10	21.90
Gujranwala	4.90	0.69	0.129	85.30	44.80	22.00	13.10
Lahore	9.73	1.49	0.370	90.92	50.20	27.00	17.70
Multan	24.47	4.50	1.250	89.30	52.80	32.80	24.90
D. G .Khan	32.81	6.85	1.900	91.10	57.20	35.60	27.10
Bahawalpur	12.10	2.05	0.517	94.90	56.30	33.90	24.80
Islamabad	2.94	0.29	0.042	83.90	43.40	21.60	13.00
Punjab	12.10	2.05	0.520	91.00	51.90	29.50	20.50

The result of table 2 shows that overall percentage of poverty in rural in Punjab is 12.10 with incident of poverty 2.05 and severity of poverty 0.520 percent. In the same way overall uni-dimensional in Rawalpindi, Sargodha, Faisalabad, Gujranwala, Lahore, Multan, D.G. Khan Bahawalpur and Islamabad is 3.87, 11.11, 7.11, 4.90, 9.73, 9.73, 24.47, 32.81, 12.10, and 2.94 percent. Depth of poverty in corresponding areas is 0.45, 1.36, 0.19, 0.69, 1.49, 4.50, 6.85, 2.05, 0.29 and 0.29 percent and severity of poverty is 0.120, 0.277, 0.913, 0.129, 0.370, 1.250, 1.900, 0.517 and 0.042 percent. These results show that households of D.G. Khan is facing higher level of income/ expenditure poverty while households of Islamabad showing lower level of poverty.

In Case of multidimensional poverty overall incidence of poverty in rural Punjab is 51.90 percent with depth and severity of poverty respectively 29.50 and 20.50 percent. In the same manner incidence of multidimensional poverty in Rawalpindi, Sargodha, Faisalabad, Gujranwala, Lahore, Multan, D.G. Khan Bahawalpur and Islamabad is 46.10, 54.90, 53.50, 44.80, 50.20, 52.80, 57.20, 56.30 and 43.40 percent. In these areas depth of multidimensional poverty is 24.40, 29.80, 31.10, 22.00, 27.00, 32.80, 35.60, 33.90 and 21.60 percent. Severity of poverty in given areas is 15.10, 19.90, 21.90, 13.10, 17.70, 24.90, 27.10, 24.80 and 13.00. The given picture of result shows that D.G. Khan is the worst affected area of rural Punjab in the case of uni-dimesnional and multidimensional poverty.

Logit Regression Model: Like multidimensional analysis, logit model is also applied to check the impact of different socio-economic variables on poverty. Such approach is developed after a strong review of literature like (Achia, Wangombe, and Khadioli, (2010); Dudek and Lisicka, (2013); Tarozzi, (2002); Zahara and Zafar, (2015)). The result of the given problem is as follow:

Table 3: Results of logit Regression Model

Variables	Coefficients	Odd ratios	Marg. Effects	Std.errors	Z-stat	P-value
No of educated persons	-0.1723	0.8416	-0.0415	0.0323	-5.33	0.000
Health Services	-3.5536	0.0286	-0.8576	0.1138	-31.20	0.000
Housing Services	-3.0525	0.0472	-0.7376	0.1029	-29.66	0.000
Facilities	-1.2304	0.2921	-0.2969	0.0424	-29.01	0.000
Per capita Expenditure	-4.7748	0.0084	-0.4534	0.4235	-11.27	0.000
Residential Status	0.0939	1.0985	0.02267	0.0374	2.51	0.012
No of Children's	0.2753	1.3170	0.0655	0.1227	2.24	0.025
Head Education	-0.037	0.9632	-0.009	0.0100	-3.72	0.000
Head age	-0.008	0.9916	-0.002	0.0037	-2.26	0.024
Constant	22.094	-	-	0.7676	28.78	0.000
Pseudo R²	0.68	Pearson	6153.67	LR Chi square	-6371.23	-
Hosmer- Lemshow	120	Roc Curve	0.9708	Iteration	5	-

The result of logit model for poverty in rural Punjab is reported in table 3. The experiential result shows that the response of coefficient of a number of educated person is negative which shows that if educated person in a house increase the probability of being poor will decrease. The coefficient of health services like access to the hospital, safe sanitation and availability of pure drinking water shows that if access to given services increases the probability of being poor falls. The basic household services index and facilities index also show a negative effect on poverty and increase in such measure decrease the probability of being poor. The increase in per capita income also improve living standard of people and cause the probability of being poor to decrease. The residential status if not present has positive sign which indicates that the probability of being poor rises if the residential status of households is not present. The coefficient of a number of children has a positive sign which shows that if the children in a house increase the probability of being a poor increase. The coefficient of headage and head education has a negative effect on poverty and shows that probability of being poor decrease if both the measure rises.

The results Pseudo R², Pearson chi-square and Hosmer- Lemeshow test indicate that overall model is good fitted because their values are two high that reject the null hypothesis of model is not good fitted in response to alternative hypothesis of the model is good fitted. The value is roc curve is almost 98 percent which indicates that given model is excellent.

Conclusion

The result of study concludes that uni-dimensional poverty in most of the areas of rural Punjab is very low except Multan and D.G.Khan The basic reasons of higher poverty in Multan and D.G.Khan rural areas is the availability of lower employment opportunity because most of the population depends on daily wages which are sometime unavailable due to lack of work. But multidimensional in rural Punjab is very high because of poor availability of necessities of life and basic services. In most of the areas of rural Punjab unavailability of electricity, health services and poor education system are the major cause of multidimensional poverty and according to logit model result if we focus on such weak areas that are discussed in logit model as a important variables we can overcome the problem of poverty in both uni-dimensional as well as multidimensional way.

References

- Achia, T,N,O., A. Wangombe and N. Khadioli. 2010. A logistic regression model to identify key determinants of poverty using demographic and health survey data. *European Journal of Social Sciences*. 13(1): 38-45
- Alkir, S. and J. Foster. 2009. Counting and multidimensional poverty measurement. Oxford Poverty & Human Development Initiative. Working paper No. 32.
- Arif, G. M., & Farooq, S. 2011. *Poverty, Inequality and Unemployment in Pakistan*. Dul - Qa'dah: Pakistan Institute of Development Economics and Islamic Development Bank .
- Asterious, D. and S.G. Hall.2011. *Applied Econometrics*. Second Edition. Mc. Grawhill.
- Bank, W. 2015. *Global Monitoring Report 2015/2016*. World Bank
- Chaudry, I, S., S. Malik and A.U. Hassan. 2009. The impact of socio-economic and demographic variables on poverty. *The Lahore Journal of Economics*. 14(1) : 39–68
- Dudek, H. and I.Lisicka. 2013. Determinants of poverty- Binary logistic regression model with interaction term approach. *Ekonometria* 3 (41): 65-77
- Foster, J., J. Greer and E. Thorbecke. 1984. A class of decomposable poverty measures. *The journal of Econometricia*. 52(3): 761-766
- Haroon, J. 2009. *Assessing Vulnerability to Poverty: Evidence from Pakistan*. Social Policy and Development Centre, Karachi.
- Khan, A. K., Saboor, A., Hussain, A., Sadiq, S., & Mohsin, A. Q. 2014 . Investigating Multidimensional Poverty across the Regions in the Sindh Province of Pakistan. *Social Research Indicators* , 515-532.
- Khan, A., A. Saboor, S. Ahmed and A. Ali. 2011. Mapping and measuring of multidimensional poverty in Pakistan: Empirical investigation. *Pakistan Journal of Life and Social Science*. 9(2):121-127
- Nazli, H., Whitney, E., & Mahrt, K. 2015 . *Poverty trends in Pakistan*. United Nations World University Institute for Development Economics Research.
- Salahuddin, T. and A. Zaman. 2012. Multidimensional poverty measurement in Pakistan: Time series trend and break down. *Pakistan Development Review*. 51(4) :493-504
- Sial, M. H., Noreen, A., & Awan, R. U. 2014. Measuring Multidimensional Poverty and Inequality in Pakistan. *Poverty, Inequality and Economic Growth*. Islamabad: Pakistan Institute of Development Economics (PIDE).
- Zahra, K. and T. Zafar. 2015. Marginality and multidimensional poverty: A case study of Christian Community of Lahore, Pakistan. *Pakistan Journal of Commerce and Social Science*. 9(2): 322-335