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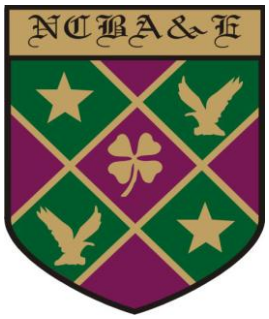

AN ANALYSIS OF MULTIDIMENSIONAL POVERTY: A CROSS-DISTRICT STUDY OF PUNJAB (PAKISTAN)

BY

MUHAMMAD AMJAD CHOHAN

MASTER OF PHILOSOPHY
IN
ECONOMICS

OCTOBER, 2016

NATIONAL COLLEGE OF BUSINESS ADMINISTRATION AND ECONOMICS

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A dissertation submitted to
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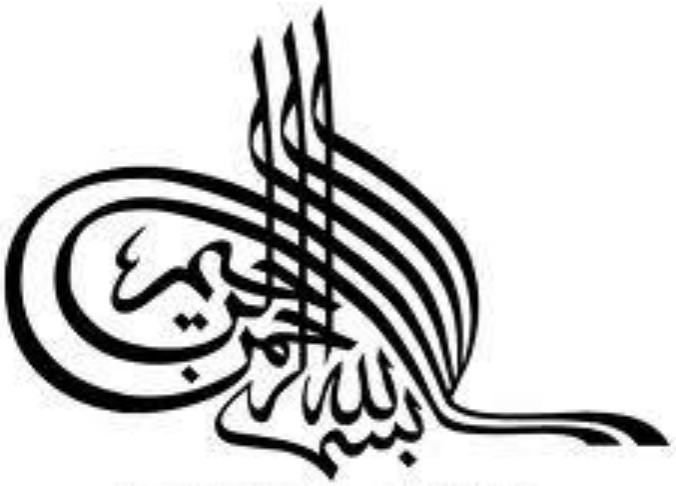

In the name of ALLAH,
The Most Beneficial,
The Most Merciful,

NATIONAL COLLEGE OF BUSINESS ADMINISTRATION AND ECONOMICS LAHORE

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Dissertation Committee:

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Chairman

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Member

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Member

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Rector
National College of Business Administration and Economics

DECLARATION

It is to declare that this research work as not been submitted for obtaining similar degree from any other university/college.

MUHAMMAD AMJAD CHOHAN
OCTOBER, 2016

DEDICATED
TO

My Family

&

My Friends

ACKNOWLEDGEMENT

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In the end I am grateful to my colleagues and entire faculty of Economics Department, National College of Business Administration and Economics (NCBA&E).

RESEARCH COMPLETION CERTIFICATE

Certified that the research work contained in this thesis entitled **"An Analysis of Multidimensional Poverty: A Cross-District Study of Punjab (Pakistan)"** has been carried out and completed by **Muhammad Amjad Chohan** under my supervision during his **M.Phil. Economics** Programme.

(Dr. Zahid Pervaiz)
Supervisor

SUMMARY

Present study is an attempt to measure multidimensional poverty index (MPI) across the districts of Punjab. Some possible determinants of MPI have also been explored by utilizing cross sectional data of multiple Indicator Cluster Survey (2012). Ranking of all districts of Punjab have also been made on the basis of headcount ratios and MPI. Results suggest that multidimensional poverty have negative and significant relationship with remittances, population density and access to health facilities.

LIST OF TABLES

LIST OF FIGURES

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Poverty is considered as one of the major problems of any developing nation. It is considered as a major cause of hunger and under nourishment. About fifteen percent of world population is facing hunger (Pakistan Economic Survey, 2010). Poverty reduction has been one of the main tasks of the developing nations (Bourguignon and Chakravarty, 1999). In Millennium Summit of September 2000, one of the goals was to reduce poverty by half of the proportion of poor by 2015. But despite all poverty lessening initiatives, more than 2.2 billion people are still living in multidimensional poverty in the world (UNDP, 2014).

Poverty is generally measured on the basis of per capita income and consumption. However, there is a conceptual issue with this approach that number of poor can be reduced by moving poverty lines towards zero (Callan and Nolan, 1991). More wealth may be earned with more capabilities and human skills (Salahuddin and Zaman, 2012). Poverty is a multidimensional phenomenon (Bohnke and Delhey, 1999; Bourguignon and Chakravarty, 2003; Jamal, 2009; Awan et al. 2011; Salahuddin and Zaman, 2012; Ashraf and Usman, 2012; Vijaya et al. 2014). The poor have less access to basic needs like health, education and adequate sanitation. Hence, Poverty should be measured with the help of multidimensional indicators instead of unidimensional methodologies based upon income or consumption. The concept of multidimensional poverty measure is derived from Amartya Sen's Capability Theory (Sen, 1976, 1997) that provide the basis to include more dimensions in measurement of poverty. If poverty is measured by multidimensional index then researchers would be able to reflect comparatively better depiction of the poverty trends. It will enable the researchers to identify specific dimensions of poverty that would be helpful for policy making.

Alleviation of Poverty has been leading challenge in the history of developing world because it has severe impacts on the process of development. In South Asia, almost 557 million people are poor whereas the share of poverty has been increasing over time (UNDP, 2013). But the MDGs show that poverty has been decreasing in Pakistan from 34.5 percent in 2001-02 to 12.4 percent in 2010-11. Economy of Pakistan is also entangled in poverty and

economic inequalities. However, during 1990s the Poverty issues become more problematic due to manifold reasons comprising of non-availability of social safety nets, inflation, poor governance, slow growth and destabilizing policies etc. (R. Haq and Bhatti, 2010; Naseem, 2012). Chani et al. (2011) also suggest that inflation and slow growth may be a cause of rise in poverty in case of Pakistan. United Nation Development Program (2010) examined that in 2009, 54 percent of population in Pakistan were poor. Afterwards poverty has rising trend from 2007 and onward (UNDP, 2013; World Bank, 2010). Pakistan's position is worsen in social indicators such as infant mortality, female literacy, political instability and corruption (Easterly, 2003). Human Development Report (2014) ranked Pakistan at 146 out of 187 countries in Human Development Index. Poverty is significantly mounting in Pakistan as well (Naseem, 2012).

According to population census of 1998 Punjab is the most populous province of Pakistan having more than 56 percent of total population. Punjab is the economic hub of Pakistan. Punjab is considered as comparatively more developed province of Pakistan. But it is also facing poverty with differences in incidence across the districts. The severity of poverty is higher in South Punjab than in North Punjab regions (Cheema et al. 2008; Sikander and Shah, 2010). It means that structure of growth is unbalanced which itself creates inequality that is why certain areas are clutched in vicious circle of poverty and extreme hunger. It is necessary to investigate the current status of deprivation level of the households and individuals.

For the purpose of poverty alleviation investments in human capital, education and health sector might play vital role in increasing the earning capacity of an individual because highly educated people are highly paid. Similarly, place of living also changes earning capacity of an individual as people in urban area have more earning opportunities than a person living in rural area that is causing internal migration.

In present study we are examining poverty in Punjab province on districts basis. This research is an attempt to investigate the multidimensional poverty index (MPI) and its determinants for the districts of Punjab province using household level data.

MPI presented by Alkire and Santos (2010), Alkire and Foster (2011a) and UNDP (2011) measures poverty in terms of quality of life by assessing three dimensions i.e. education, health and standard of living, with the help of ten different indicators (UNDP, 2011). Poverty is a multifaceted phenomenon and it cannot be assessed by per capita income only. The deprivations in living standards, health facilities, education, jobs, skills, environment, housing,

communication, transport and equitable distribution of income also reflect poverty. In present research we followed UNDP (2011), Alkire and Foster (2011a) and Alkire and Santos (2010) methodology to calculate MPI for districts of Punjab. UNDP (2014) has also measured multidimensional poverty index for all districts of Pakistan by using various data sets of Pakistan Social and Living Standards Measurement Survey (PSLM). But in present study we have utilized the data of Multiple Indicator Cluster Survey (MICS, 2011) that is conducted by Punjab Bureau of Statistics. Because MICS is considered as one on the widest data set for the province of Punjab. We have also investigated possible factors that determine poverty for districts of Punjab. Measurement of poverty will show the current socioeconomic status of the households in the Punjab that might be helpful in the policy making.

1.2 OBJECTIVES OF THE STUDY

The objectives of this study are:

i. To construct Multidimensional Poverty Index for the districts of Punjab.

ii. To investigate the head count ratios using MPI for the districts of Punjab.

iii. To investigate important determinants of multidimensional poverty for the districts of Punjab.

1.3 RESEARCH QUESTIONS

This Study intends to address the following research questions.

i. What is the status of multidimensional poverty across districts of Punjab?

ii. What are the factors that determine multidimensional poverty across the districts of Punjab?

1.4 HYPOTHESIS

The following null hypothesis have been constructed for the study:

H_{01}: Access to health facility does not have impact on MPI.

H_{02}: Education infrastructure does not have impact on MPI.

H_{03}: Remittances does not have impact on MPI.

H_{04}: Population density does not have impact on MPI.

1.5 NOVELTY

Poverty has been measured by many researchers. Jamal (2009) measured poverty by using Household Integrated and Economic Survey (HIES) (2001) and (2005). Awan et al. (2011) measured poverty by using Multiple Indicator Cluster Survey (MICS) (2004) by utilizing Alkire and Foster (2007) methodology. Ashraf and Usman (2012) measured poverty by using and MICS (2008). Whereas, khan et al. (2014) and khan et al. (2015) used Pakistan Social and Living Standards Measurement Survey (PSLM) and HIES data sets. But in present study we will measure multidimensional poverty across the districts of Punjab by taking households as unit of analysis and by using different indicators. We will utilize household dataset from MICS (2012). We will utilize Alkire and Santos (2010) and UNDP (2011) methodology with slightly differentiated definitions of indicators. We will also investigate some possible factors that determine poverty for districts of Punjab.

CHAPTER 2

LITERATURE REVIEW

2.1. MEASUREMENT OF POVERTY

Poverty is considered as one of the important issue for every economy in the development process, Haq (1976) associated economic development with eradication of poverty. Poverty reduction directly increase the inventive and earning abilities of people (Moser, 1998). Measurement of poverty is controversial in literature because how one measure poverty reflects that how one understands poverty. Unidimensional Poverty methods measure poverty by using income measure or consumption measure but Multidimensional poverty measures provide unconventional lens to measure and assess the poverty status (Alkire and Foster, 2011b).

In measurement of poverty, the major problem is to identify the poor, whether poverty line should be based on income or expenditure and whether poverty measure should be absolute measures or relative measures similarly unit of analysis should be households or individuals. Headcount ratio is the proportion of population below the poverty line. It measures the incidence of poverty but it fails to account the intensity of poverty. While using headcount ratio, those persons who fall very near to the poverty line are also considered as poor. Poverty gap ratio or income gap ratio can overcome this shortcoming, which look at the total shortfall of poor incomes from the poverty line and express this shortfall as a fraction of national income (as in the poverty gap) or as a fraction of the total income required to bring all the poor to the poverty line (as in the income gap ratio) but these measures are indifferent to the relative deprivation of the poor (Ray, 1998).

Sen (1976) proposed that there should be a new poverty measure to develop the poverty profile. He criticized two basic poverty measures, the head count ratio and income gap ratio. The head count ratio and income gap ratio depends on redistribution of income among the poor people. He proposed that a good poverty measure should follow axiom of monotonicity and axiom of transfer. He further argued that economic and social provisions should be assessed in terms of capabilities enjoyed by those who live in them. Sen (1976) was more concerned to propose a poverty measure that consists of an index of poverty by using available information of individuals.

Chakravarty (1983) discussed about incidence of poverty and intensity of poverty. When proportion of population below the poverty line is measured with the help of headcount ratio it shows incidence of poverty. It does not reveal the intensity of poverty that a poor suffered. The author introduced another unidimensional poverty index named aggregate utility gap index which measure the utility gap for rich and poor. Aggregate utility gap index measures the gap of income profile of a poor from the social state. Poverty index proposed by Chakravarty (1983) follows axiom of monotonicity and axiom of transfer. It is also decomposable when population is taken into groups. Whereas when transfer of income is at the lower end of income distribution the poverty index gives it greater weight. Bourguignon and Chakravarty (2003) also concluded that least subsistence level should be achieved and standard of living should be improved whether in monetary terms or in non-monetary terms. Therefore poverty decrease when social facilities increase and standard of living improves. Thus poverty is multidimensional phenomenon.

Foster et al. (1984) introduced decomposable measures to quantify poverty now known as FGT (Foster, Greer and Thorbecke) Indices. The authors introduced a decomposable poverty measure that is based on concept of relative deprivation measures and will also follow the basic properties of a good poverty measure proposed by Sen (1976). They further argued that a poverty measure of total population should decrease if there is a decrease in the poverty of a subgroup. So a good poverty measure should represent the contribution of a subgroup to total population. It can be possible if poverty of whole population is measured by weighted average of poverty of subgroups.

Callan and Nolan (1991) compared various poverty measures and highlighted their respective shortcomings. They suggest that in measurement of poverty there are challenging issues on conceptual basis and on empirical levels. Because one have to identify poor and extent of poverty out of total population. Authors concluded that no single poverty measure dominate in comparison with other poverty measures. So in search of comparatively better poverty measure multidimensional methodology should be used.

So far as measurement of poverty is concerned, Coudouel et al. (2002) highlighted three components that should be kept into consideration in measurement of poverty. Three components are relevant dimensions and indicators of well-being, a threshold poverty line and a measure to show the poor out of entire population. But measurement of poverty depends on data availability as the unit of analysis is household or individuals. In last two decades Pakistan Bureau of Statistics took many steps to make survey data reliable (Awan et al. 2011). Multiple Indicator Cluster Survey (MICS) is also a

reliable household survey conducted by Punjab Bureau of Statistics after every four years since 2004.

Jamal (2009) measured poverty by using multidimensional poverty index (MPI) for Pakistan using data of Household Integrated and Economic Survey (HIES) 2001 and 2005. He constructed a composite index by using cluster analysis and factor analysis for financial poverty, human poverty, poor housing and lack of physical assets. Author also compared the rural MPI with urban MPI and concluded that rural poverty indices are higher than urban poverty indices. He further concluded that multidimensional poverty indices are more reliable in the long run. Jamal (2009) used FGT indices and quantifies the extent of multidimensional poverty for the first time in Pakistan. The empirical results suggest that in 2005 about 54 percent of population of Pakistan was multi dimensionally deprived. The urban incidence of poverty was 21 percent whereas rural incidence of poverty was about 65 percent.

Awan et al. (2011) measured multidimensional poverty for the districts of Punjab by using Alkire and Foster (2007) methodology. MICS 2004 data was used to measure the poverty across the districts of Punjab which include data from sample of 30932 households of 34 districts. They used eight dimensions to measure multidimensional poverty. They did dimension wise analysis to investigate the major cause of multidimensional poverty. Authors held education, housing, sanitation, number of bedrooms and land deprivation as major contributor to poverty. They suggest that Socio economic developments and National Finance Commission awards can help in alleviation of poverty. Authors further suggest that special attention should be given to southern Punjab regions as these regions are major contributor in composition of poverty in Punjab province.

Salahuddin and Zaman (2012) also suggest that poverty being an intricate phenomenon cannot be measured and comprehended by accumulation of income only. They used time series data from 1998-2006 and utilized Alkire and Foster (2007) multidimensional methodology, instead of absolute poverty lines, to form time series trends of poverty at provincial level across Pakistan. Authors argued that mere acquirement of wealth does not reflect development. It is about increase in capabilities that a person have. They further argued that wealth did not create by accumulated capital or natural resources. It is human beings, their capabilities and skills that generated wealth by utilizing the resources. They concluded that people of Pakistan are highly deprived in the fields of health and education. Both sectors play vital role in process of development because youth are the riders of economy and there productivity improve by improvements in education and health sectors.

Ashraf and Usman (2012) measured multidimensional poverty for districts of Punjab using survey data from MICS 2008. They followed Alkire and Foster (2007) methodology and ranked the districts of Punjab into three ranks as low, medium and extreme poverty. They categorized the districts of Punjab with respect to their respective deprivations. They further concluded that magnitude of MPI is high in districts of lower Punjab. But Ashraf and Usman (2012) did not investigate possible determinants of poverty differences in 36 districts of Punjab.

Khan et al. (2014) investigated multidimensional poverty for Rawalpindi region. They used data from HIES and Pakistan Social and Living Standards Measurement Survey (PSLM) for five time periods 1999, 2002, 2005, 2006 and year 2008. Authors used socioeconomic dimensions to measure poverty instead of using only financial deprivations. They used three dimensions related with measurement of multidimensional poverty namely housing facilities, health and education. They concluded that rural poverty incidence was higher than urban poverty incidence. They further concluded that in their region of study multidimensional poverty measure showed a higher magnitude of poverty as compared to absolute poverty measures. Authors observed higher deprivation in education as primary reason for higher multidimensional poverty.

Vijaya et al. (2014) used survey data from Karnatka Household Asset Survey and explored multidimensional poverty. They used individuals instead of households as unit of analysis to estimate intra-household variations in resource allocation on the basis of gender. Authors found that non poor households had many poor individuals. They argued that poverty should be measured by taking individuals as unit of analysis instead of household. Then poverty measure will reflect reality in better way. But biggest challenge in measurement of poverty on individual basis is data availability. They concluded that in terms of deprivations more incidence of poverty is experienced by women in majority as compared with men.

Khan et al. (2015) measured the urban poverty. They argued that socioeconomics characteristics are different in urban and rural areas that is why urban poverty is different from rural poverty. They measured poverty on division basis by using five data sets of HIES and PSLM for the periods 1999, 2002, 2005, 2006 and 2008. They also used three dimensions of poverty i.e. health, education and housing services. They observed national level incidence of poverty. They also observed poverty and deprivation across various regions of Pakistan. They concluded that poverty have moving trend from rural areas to urban population. They further concluded that possible factors for higher

urban poverty are living standard inequalities, pathetic law and order situation, inflation and unemployment.

2.2 DETERMINANTS OF MULTIDIMENSIONAL POVERTY

Poverty alleviation is primary target of the policy makers. On the one hand, measurement of poverty is important, and on the other hand, it is also important to investigate the possible determinants of poverty. Because poverty can be eradicated by making improvements in primary determinants. In literature, some important determinants have been identified. Haughton and Khandker (2009) argued that most poverty measures define the status of poverty not the cause of poverty. They further argued that researchers should trace the root causes of poverty. Because when we will able to describe the cause of poverty then it can be tackled in a better way. They highlighted few causes of poverty such as individual and household characteristics, community level characteristics and regional level characteristics. Individual and household characteristics include social characteristics (shelter, education, health and nutritional status), economic characteristics (property ownership, hours worked and employments status) and demographic characteristics (gender of head of household, dependency ratio, age structure and household size). Characteristics on community level includes access to education, health and infrastructure along with electricity, water and roads etc. Characteristics on regional level include excellence of governance, law and order conditions, right to property and defenselessness to natural disaster etc.

Poverty is highly correlated with the absence of productive asset holdings, such as holdings of land. Poverty is correlated with lack of education, and there is a close association between poverty and nutrition, although nutrition levels do not seem to rise as quickly with household income as we might suppose a priori. The important impact of poverty is that the poor may have less access to markets, most particularly the markets for labor, insurance, credit, and land (Ray, 1998).

Chaudhary (2003) investigated determinants of poverty in Cholistan using household level data. According to the study mainly socio-economic and demographic factor were responsible for severe poverty in Cholistan. He further concluded that qualitative as well as quantitative variables are responsible for poverty. He considered housing characteristics, asset position, education and health related issues. These factors can also be relevant to determine poverty across districts of Punjab.

Bogale et al. (2005) examined determinants of rural poverty in Ethiopia. They used survey data from 149 households of three districts of rural Ethiopia. Authors measured severity and extent of poverty by using FGT index. They concluded that excess to assets, oxen, land and human capital are responsible for poverty in Ethiopia. They further concluded that lack on infrastructure and education facilities are also responsible for severe poverty in rural Ethiopia. Authors suggests that targeted measures should be implemented to reduce poverty. There will be reduction in poverty when more access to education, assets and decision making would be given to women as well. Similarly nutritional status of households/individuals should also be improved to alleviate poverty.

Dewilde (2008) measured multidimensional poverty for ten selected European countries. He evaluated the effect of a variety of domain specific indicators in welfare state arrangements on the issue of poverty. He measured poverty by using non-monetary and monetary indicators so his measurements incorporated the welfare effects along with income replacements. He also considered employment, institutions and demographic and socio-economic characteristics of households responsible for poverty. Author suggested that living standards determine the status of household. He further remarked that labor market flexibility will severe the incidence of poverty.

Achia et al. (2010) studied about various factors affecting poverty in Kenya. They utilized demographic and health survey data and used principal component analysis to create asset index for measurement of poverty. They further estimated the Logistic regression using poor and non-poor as dependent variable and demographic characteristics were taken as independent variables. Authors concluded that probability of being poor is highly attached with rural families. They further conclude that demographic factors are also responsible in increasing the probability of being poor along with ethnicity, region, religion and age of the household head. If we have a comparison between urban and rural areas the urban areas have facilities of formal housing, water and sanitation facilities whereas rural are ignored in terms of piped water, flush toilets and adequate housing facilities.

Sikander and Shah (2010) emphasized on development of social sector they investigated access to social services across the districts of Punjab by utilizing dataset of MICS 2008. They calculated GINI coefficients in order to investigate the inequalities across the districts of Punjab in access to physical infrastructure, health, education. Authors concluded that allocation and access to resources as a major cause of inter-districts inequalities in Punjab province. They concluded that distance from major cities is a major reason that small districts are ignored. They further conclude that it is the public institutions and

distribution of resources from public sector, to all districts, which ultimately determine the financial and economic status of districts and individuals.

Said et al. (2011) also investigated status of poverty in Pakistan by utilizing the dataset of PSLM 2009. They formed asset index and basic need index with the help of household level indicators for districts of Pakistan to determine the poverty status. They held industrial development, dependency ratio, urbanization, employment rate and infrastructure as major determinants of the explored poverty pattern. They suggest that for well-being of the deprived districts public policy must consider the above mentioned factors.

CHAPTER 3

AN OVERVIEW OF POVERTY IN PAKISTAN

Pakistan has been facing many social, administrative and economic problems since its independence. Even today, Pakistan is considered as a nation with multifaceted challenges including corruption, economic inequality, political instability, unemployment, poor infrastructure and poverty. Poverty alleviation has been main task for the administrators, policy makers, international donors and researchers. Government of Pakistan is also continuously working for sustainable poverty lessening policies and assign at least 4.5 percent of GDP to social and poverty related expenditures. In order to reduce poverty and food insecurity government is providing social protection to vulnerable and poor people by giving them help in kind or in cash. Government is also increasing pro-poor expenditures on social sectors to reduce poverty (Pakistan Economic Survey, 2015). Despite all the efforts, Pakistan is still facing poverty. World Bank measured poverty in 2010 through head count ratio by threshold line of two dollars a day and observed that more than 50.67 percent of population were poor in Pakistan. Oxford Poverty and Human development Initiative figures shows that Multidimensional poverty in Pakistan fell from 49.4 percent in 2007 to 45.2 percent in 2013 (OPHI, 2015) whereas Social Policy Development Centre shows multidimensional poverty in Pakistan slightly fell from 49.4 percent in 2005 to 48.1 percent in 2011 (Jamal, 2012).

As a developing nation, poverty always remained one of the foremost concern in Pakistan. Economy of Pakistan has been severely affected by natural disasters such as earthquake, floods etc. Affected areas lag behind in the infrastructure and socio economic indicators. Inflation is also affecting the poverty status as rise in domestic prices further push the people below the poverty line. Food price inflation from fiscal years 2008 to 2011 has averaged 18 percent it also worsen the purchasing power of poor (Pakistan Economic Survey, 2011). One of the basic problems is the definition and measurement of poverty. It is always remained under the discussion of researchers that who should be included in the class of poor. Multiple approaches have been used to define poverty like income and consumption approach, minimum calorific approach and basic needs approach. Poverty is the deficiency of basic social needs, such as nutrition, clean water, education, health care, shelter and clothing, as the poor has inability to pay for them.

Poverty substantially increased in Pakistan in 1960's due to lack of poverty lessening policies. With certain effective measures to decrease poverty, the reduction in poverty in 1970s was evident. In 1980, there was a downward trend in poverty but an increased trend was observed in 1990's and, to some extent, it continued in 2000's (Arif and Farooq, 2012). At the end of 1980's structural adjustment program (SAP) was started to reduce fiscal deficit, severe restrictions on the role of government, elimination of subsidies from production and consumption. But these programs have adverse effects on growth and poverty. SAP went together with rising poverty and inequality. The Gini coefficient was 0.335 in 1964 and it rose to 0.410 in 2011 (Zaidi, 2015).

Throughout the 1990's, historically high corruption, political instability, worsen law and order situation had substantial adverse effects on GDP growth and poverty. Government's strategies to address the fiscal crisis were important factors to slow down the GDP and to increase the poverty. Under the SAP in 1990's, reduction in instantly desired public expenditures and poverty alleviation projects simultaneously decelerate GDP growth and increased poverty. Similarly tax revenues were increased through indirect taxation instead of direct taxation and that have exacerbate impacts on income distribution and it might have been a cause of increase in poverty (Hussain, 2006). According to Pakistan Human Condition Report, all standard economic and social indicators showed severe poverty in Pakistan at the end of 1990's. 45 percent of total population of Pakistan did not have access to sufficient health care, 40 percent did not have access to clean drinking water and 55 percent were deprived of sanitation facilities (Zaidi, 2015).

There was a remarkable reduction in poverty from 2001 to 2008. The population share living in poverty line reduced from 34.5 percent in 2001 to 17.2 percent in 2008. This poverty reduction was significant in both rural and urban areas. The urban poverty down to only 10 percent of the population (Zaidi, 2015). Poverty prevails in Pakistan over the period 2008-2013 as well. There may be numerous reasons for this like high inflation in Pakistan during the time, particularly fuel and food inflation which reduced the purchasing power.

Table 3.1
Proportion of Poor in Pakistan (Headcount Ratio)

Year	Total	Rural	Urban
1963-64*	40.24	38.94	44.53
1966-67*	44.50	45.62	40.96
1969-70*	46.53	49.11	38.76
1979*	30.68	32.51	25.94
1984-85*	24.47	25.87	21.17
1984-85**	46.0	49.3	38.2
1987-88*	17.32	18.32	14.99
1987-88**	37.4	40.2	30.7
1990-91*	22.11	23.59	18.64
1990-91**	34.0	36.9	28.0
1992-93*	22.40	23.35	15.50
1993-94**	28.6	33.4	17.2
1996-97*	31.00	32.00	27.00
1998-99*	32.60	34.80	25.90
1998-99**	32.6	35.9	24.2

Source: Zaidi (2005; 2015); Pakistan Economics Survey (Various issues)

Table 3.1 reveals the trends in poverty in Pakistan. Headcount ratios with (*) represents the headcount ratio measured by planning commission of Pakistan and reported in Economic Survey of Pakistan. Headcount ratios with (**) represent the headcount ratios measured by World Bank. Both values showed a decline in poverty in 1988, after which, it continued to decline into the late 1990's. Another noticeable trend from the table is consistent reduction in urban poverty till 1994. Though only 23 percent of population lived in cities in 1960's that is more than 60 percent in present decade (Zaidi, 2015). This decrease in urban poverty has sustained even when there was an increase in rural poverty. A dramatic reduction in poverty in the 1970's credited to decrease in rural poverty that is accounted for bigger proportion of the population and of the poor. The fall in poverty in 1970's to 1980's was due to many programs and initiatives. Foremost of them is nationalization of banks which caused growth in bank branches, expansion of credit to agriculture

especially to small farmers, direct credit to small scale sector and significantly increased urban employment due to growing construction sector. Remittances and migration to Middle East have been another factor which changed economic and social culture of Pakistan. It has the beginning in mid-1970s and caused significant reduction in poverty from 1975 to the end of 1980's and over again in 2000's. This process grew into single best factor for high growth rates and, hence, reduction in poverty. The high growth rates of 1960's were repeated again in 1980's. In 1980's per capita income rose by 3.2 percent a year as compare to recorded rise 3.9 percent in 1960's.

Punjab is the biggest province of Pakistan with respect to population. Punjab is also facing poverty which varies across the districts. Government is taking many initiatives to improve education and health facilities. Importance of improvements in social sectors have been recognized to alleviate poverty (Ali and Ahmad, 2013). Poverty reduction leads to betterment of people which ultimately boost economic development.

Punjab has significant variations in poverty among its different regions. There are numerous correlates of rural poverty in Punjab. Landlord tenant system is dominating in Punjab resulting collection of rural wealth in few hands (Hussain, 1988). Another important issue is difference in poverty in North regions of Punjab as compared with South regions along with urban rural poverty. Poverty estimates show that population living below the poverty line in North Punjab is 27.7 percent as compared to 43.1 percent in South Punjab regions (Pildat, 2010). So one of the reasons of high poverty in Punjab is higher percentage of poverty in south regions. The incidence of poverty in Punjab also varies across the districts. In spite of poverty alleviating schemes and initiatives poverty still prevails in Punjab Province.

There is significant diversity in level of poverty in rural and urban areas within the Punjab. Cheema et al. (2008) examined the variability of poverty across the Punjab and divided Punjab into four regions. The Northern Punjab included four districts Rawalpindi, Jhelum, Attock and Chakwal. West included districts of Mainwali, Bhakkar, D.G. Khan, Khushab and Muzaffargarh. Southern Punjab included districts of Old Bahawalpur state and Multan division. Remaining were included in the Center. South and west Punjab have more poverty than in Center and Northern Punjab. The headcount ratio in southern Punjab was 45 percent that is more than double as compared with northern areas, where it was 12 percent. Similarly southern rural areas have more poverty as compared with northern rural areas.

Table 3.2
Trends of Poverty in Punjab

Year	Urban Areas	Rural Areas	Punjab
1993	22	26.5	25.2
1994	18.1	33.9	29.5
1997	16.9	28.3	25
1999	25.5	36	33
2011	35.3	34.86	35

Source: (Zaidi, 2015).

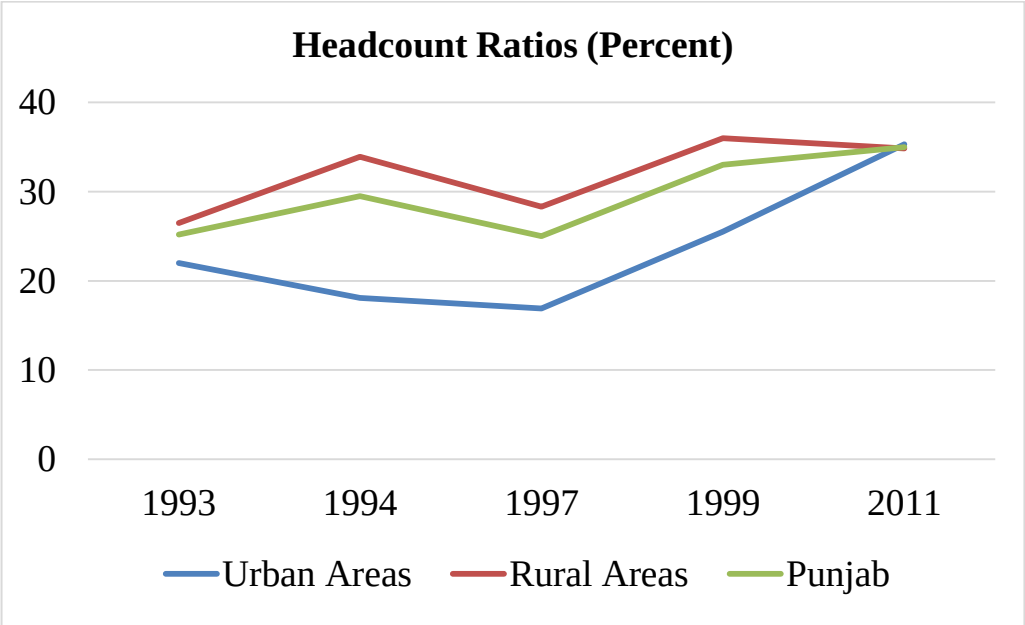


Figure 3.1: Trends of Poverty in Punjab

Table 3.2 and Figure 3.1 represent historical trends of poverty in Punjab. The headcount ratios show that poverty is gradually increasing in Punjab. In last decade poverty in urban areas is also increasing. In 1993 headcount ratio in Punjab was 25.2 percent whereas it has increased to 35 percent in year 2011. Poverty in rural areas has increased from 26.5 percent to 34.86 percent in years 1993 to 2011. Government of Punjab should also take notable initiatives to reduce poverty.

Table 3.3
Poverty Related Budgetary Expenditures (Million Rupees)

Sectors	2010-11	2011-12	2012-13	2013-14
Roads, Highways & Bridges	99,567	111,883	94,750	96,504
Environment / Water Supply & Sanitation	28,506	36,570	34,055	32,000
Education	322,811	393,523	479,853	537,598
Health	106,017	134,182	161,202	201,986
Population Planning	4,861	5,826	7,142	12,609
Social Security & Welfare**	56,315	68,437	72,898	93,398
Natural Calamities & Other Disasters	49,115	77,096	32,699	18,404
Agriculture	115,511	134,448	148,554	157,894
Land Reclamation	3,669	4,347	4,805	4,796
Rural Development	19,109	32,979	31,926	14,727
Subsidies	497,441	689,221	556,113	502,098
People's Works Programme-I	5,049	4,296	3,346	-
People's Works Programme-II	21,300	33,589	42,486	-
Low Cost Housing	373	383	603	676
Justice Administration	14,223	17,082	22,512	24,378
Law and Order	169,791	194,495	220,343	237,027
Total	**1,513,658**	**1,938,357**	**1,913,287**	**1,934,095**
Total as Percentage of GDP (2005-06 base)	**13.24**	**11.55**	**13.10**	**14.16**

** Social Security & Welfare includes the expenditure of Benazir Income Support Program (22,358 million) and Pakistan Bait-ul-Mal (529 million)

Source: Pakistan Economic Survey (2015)

Table 3.3 shows government expenditures on social sectors which directly affect the poverty status of the individuals. Expenditures relating to Social safety nets have been increasing gradually. But government has to concentrate more on social sectors to improve standards of living. Improved infrastructure, health facilities, education facilities, water and sanitation facilities may help to reduce poverty (Asghar et al. 2012). Reduction in poverty directly related with GDP growth (Roemer and Gurgerty, 1997).

Government of Pakistan is using many social safety programs to improve social sectors and to reduce poverty. But these initiatives have not been successful to achieve the targeted objectives. These programs include following social safety programs being exercised in Pakistan namely:

i. Workers Welfare Fund
ii. Employees Old age Benefit Institution
iii. Zakat
iv. Benazir Income Support Program
    a. Waseela-e-Taleem
    b. Waseela-e-Rozgaar
    c. Waseela-e-Haq
    d. Waseela-e-Sehet
v. Pakistan Bait-ul-Mal
vi. Pakistan Poverty Alleviation Fund

Table 3.4
Government Expenditure on Education

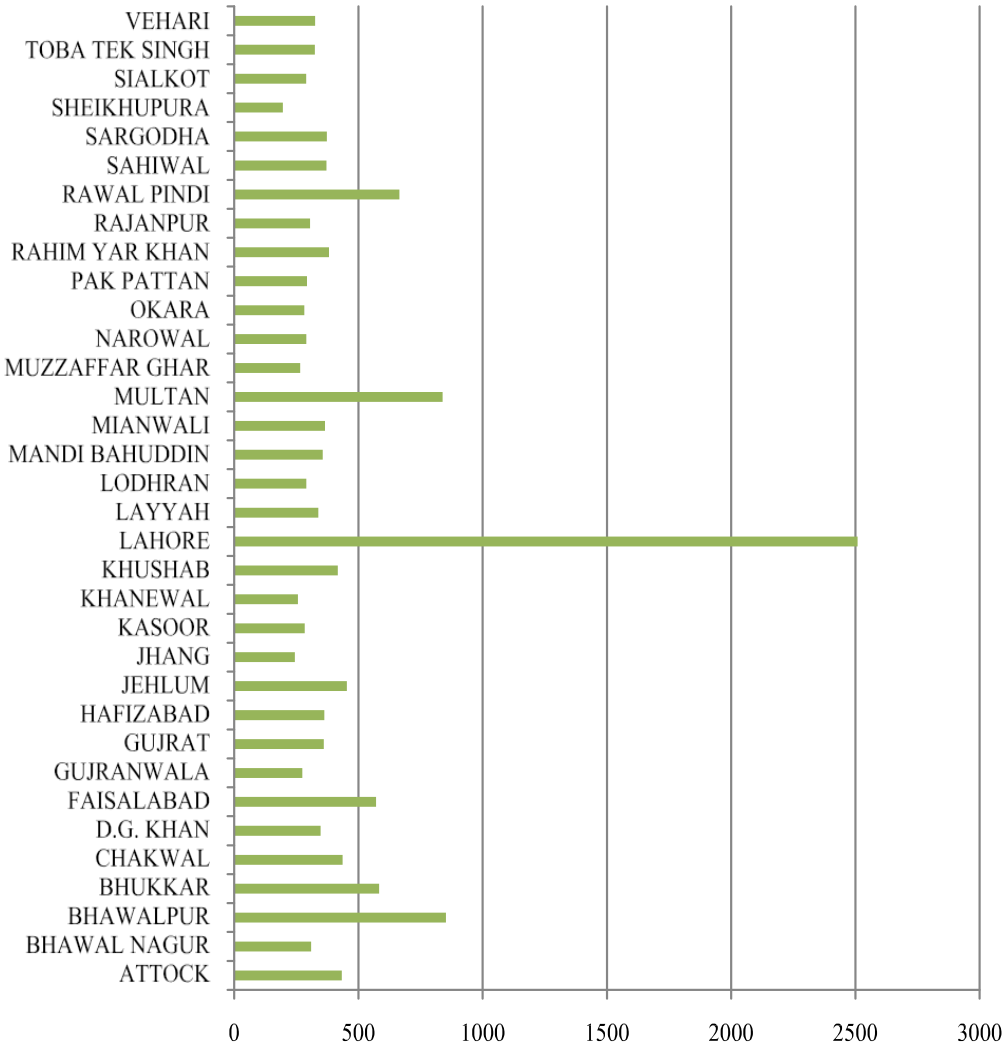
Year	Education Expenditures in Punjab (Billion Rupees)	Punjab Education Expenditure as Percentage of its GDP	National Education Expenditure as Percentage of GDP
2001-02	27.5	1.1 percent	1.5 percent
2002-03	31.7	1.2 percent	1.6 percent
2003-04	44.7	1.4 percent	1.7 percent
2004-05	50.6	1.4 percent	1.8 percent
2005-06	55.9	1.3 percent	1.9 percent
2006-07	71.4	1.4 percent	1.9 percent
2007-08	76.2	1.2 percent	1.8 percent
2008-09	104.0	1.4 percent	1.9 percent
2009-10	107.3	1.2 percent	1.7 percent
2010-11	143.5	1.3 percent	1.8 percent

Source: (Pildat, 2012).

Education is essential for development in every economy as it is important social sector. Education is considered as main dimension in measuring the phenomenon of multidimensional poverty. Table 3.4 reflects the expenditure on education sector incurred by federal government and government of Punjab. There is no significant increase in education

expenditures was observed in Punjab as well as in Pakistan. Education expenditure in Punjab lies between 1.1 percent and 1.4 percent in last decade. However, from 2002 to 2011 education expenditures have increased in absolute values from 27.5 to 143.5 rupees. According to the Pildat (2012) literacy rate of Pakistan has been increasing since independence. It was 16.40 percent in 1951 whereas, in 2009, it was reported as 57 percent. But desired level of literacy is always 100 percent that is not yet achieved. In Pakistan, education budget is about 2 percent of GDP and in Punjab it always remained below 1.5 percent of GDP of Punjab (Pildat, 2012).

Health sector has vital importance in improving living standard of people. In Punjab, government is concentrating on health sector but these expenditures are not sufficient to fulfill the needs of Punjab province.



Source: World Bank (2013).

Figure 3.2: Per Capita Health Expenditure in Districts of Punjab in 2012

Figure 3.2 reflects per capita expenditures on health sectors in districts of Punjab. It can be seen from Figure 3.2 that in Lahore highest per capita health expenditure are there followed by Bahawalpur, Multan, Rawalpindi and Faisalabad. But these health expenditures are not sufficient as most of the districts have less than five hundred per capita health expenditures. Health sector still need many improvements and per capita health expenditures should be increased.

Economic performance of Punjab province is improving from last few decades. In this chapter we have discussed the performance of social sectors especially education and health sectors. Despite all improvements in Punjab 27 percent of population is still living below poverty line.

CHAPTER 4

RESEARCH METHODOLOGY

Multidimensional poverty Index proposed by Alkire and Santos (2010); UNDP (2011) measures poverty in three dimensions which are education, health and standard of living. All dimensions have equal weightage. Ten indicators related with above mentioned three dimensions are used to measure MPI.

4.1 DIMENSIONS AND INDICATORS

MPI consists of three dimensions that are education, health and standard of living. Education is measured by two indicators that are year of schooling and child school attendance. Health dimension is also measured by two indicators. Standard of living is measured with help of six indicators. All indicators have their respective weights in such a way that each dimension has equal weightage. Table 4.1 shows the indicators along with their weights used in the construction of MPI.

Table 4.1
Dimensions and Indicators

Dimension	Indicators	Weights in Alkire and Santos (2010) & UNDP (2011)
Education	Years of Schooling	5/3
	Child School Attendance	5/3
Health	Child Mortality	5/3
	Nutrition	5/3
Standard of Living	Electricity	5/9
	Improved Sanitation	5/9
	Safe Drinking Water	5/9
	Flooring	5/9
	Cooking Fuel	5/9
	Assets ownership	5/9

The definitions of deprived households are described in Table 4.2. To calculate MPI, the methodology prescribed by Alkire and Santos (2010) is followed with slightly differentiated definitions of the indicators. Each household is allotted deprivation score (1 or 0) for all ten indicators mentioned in Table 4.1 and Table 4.2. If any household is considered as deprived in any indicator it is given deprivation score 1 otherwise 0 (for non-deprived household).

Table 4.2
Definitions of Indicators

Indicator	Deprived if
Year of Schooling	No household member has completed primary education.
Child School Attendance	Any school-aged child is not attending school up to class 8.
Child Mortality	Any woman in household ever had child who later died.
Nutrition	Child for whom there is nutritional information is malnourished.
Electricity	The household has no electricity.
Improved Sanitation	Sanitation facility is not improved (other than flush or pour flush to a piped sewer system, septic tank, or pit latrine; ventilated improved pit latrine, pit latrine with slab, and use of a composting toilet). Or it is improved and shared with other households.
Safe Drinking Water	Household uses water other than piped water (into dwelling, compound, yard or plot, to neighbor, public tap/standpipe), hand pump, motorized pump, tube well /borehole or turbine, protected well, spring and Bottled water.
Flooring	Household has earth/sand or dung plastered floor.
Cooking Fuel	Household cooks with animal dung, wood, coal/lignite, straw/shrubs/grass and charcoal.
Assets Ownership	The household does not own more than one of radio, TV, telephone, bike, motorbike or refrigerator and does not own a car or truck.

4.1.1 Year of Schooling

Education is an important dimension in the calculation of MPI. First indicator in the dimension of education is year of schooling. It shows whether household members are educated or not. To declare any household deprived in dimension of education least measure should be used so this indicator used primary level education. Any household is treated as non-deprived in year of schooling if any of household members have educational status of primary. In present study if education of any household member is primary or pre-school that household is assigned with the code 0 and 1 otherwise.

4.1.2 Child School Attendance

This indicator observes whether school going children are going to school or not? When any of children of a household is not attending school during year 2012 (MICS, 2011) then that household is treated as deprived household. If all children attend school then that household is treated as non-deprived in indicator of child school attendance. In present study we have considered children up to age of thirteen as school going children.

4.1.3 Child Mortality

One of the targets in Millennium Development Goals (MGDs) and Unicef (2008) is to reduce child mortality and infant mortality. The set goal of MDGs was to reduce under five mortality by two thirds between 1990 and 2015. In present research child mortality is taken as a proxy to investigate the health facilities in dimension of Health. Child mortality in considered for children up to five years. For this purpose data of all women is collected from concerned household with the question that she ever had a child who later died.

4.1.4 Nutrition

Nutritional status is also considered as important indicator for dimension of health. Overall reflection of health of a child is reflected by his nutritional status. MICS (2011) measures nutritional status of the children up to five years with the help of weight for age and height for age measures. In present study we used weight for age z-score as measured and proposed by World Health Organization (WHO). In present study any children is considered as deprived in indicator of nutrition if his weight for age is more than two standard

deviations below the median of reference population. Here moderately underweight and severely underweight both are considered in malnutrition status.

4.1.5 Electricity

Electricity is considered as an important utility provided by government therefore it is taken as an indicator for dimension of standard of living. Any household is considered as non-deprived in this indicator if it has electricity connection.

4.1.6 Improved Sanitation

Hygienic sanitation facilities are also considered as prerequisites of every healthy society as it helps in prevention of diseases and it also improves environment. The one of the targets of MGDs is to reduce percentage of households deprived of access to hygienic sanitation by one third. In present research, if any household has flush or pour flush to a piped sewer system, septic tank, or pit latrine; ventilated improved pit latrine, pit latrine with slab, and use of a composting toilet than its sanitation facility is considered as improved. The sanitation facility is only considered as improved if it is not shared with any other household.

4.1.7 Safe Drinking Water

It is the basic right of every human to have access to safe drinking water. If drinking water is not safe it can cause multiple diseases such as dysentery, typhoid, diarrhea and cholera. MGDs have goal to reduce percentage of households deprived of access to improved, safe and affordable drinking water by one third. In present study, water is considered as safe drinking water if household have access to piped water (into dwelling, compound, yard or plot, to neighbor, public tap/standpipe), hand pump, motorized pump, tube well /borehole or turbine, protected well, spring and Bottled water.

4.1.8 Flooring

MICS also provides information of housing facilities. MICS (2011) also explored that positive correlation exist between type of floor (pacca) and

wealth quintals and education of head of household. Type of walls, roof and floor also varies across the districts of Punjab and these facilities are also influenced by urbanization. In present study, any household is considered as deprived if the household has earth, sand or dung plastered floor.

4.1.9 Cooking Fuel

Solid fuels are considered important for energy requirements in every household such as heating and cooking. Across the world over three million people are relying of solid fuels for energy requirements. If cooking fuels are not improved people may have risk of severe diseases such as asthma, tuberculosis, pneumonia and cataracts. In present study, any household is treated as deprived in the indicator of cooking fuel if they use animal dung, wood, coal/lignite, straw/shrubs/grass and charcoal as cooking fuel.

4.1.10 Assets Ownership

Ownership of assets represent the economic strength of any household. Standard of living also improves if household have more assets. In present study, any household is considered as non-deprived if it owns a car or truck. Similarly, any household is considered as deprived if it does not own more than one of radio, TV, telephone, bike, motorbike or refrigerator and does not own a car or truck.

We have calculated MPI by following Alkire and Santos (2010), Alkire and Foster (2011a) and UNDP (2011) methodology and utilized household data of MICS (2012). While calculating MPI, only those households are considered for which we have information of all ten indicators shown in Table 4.2.

4.2 CONSTRUCTION OF MULTIDIMENSIONAL POVERTY INDEX

MPI is calculated using Household data from MICS (2012) and by following Alkire and Santos (2010) and UNDP (2011). While calculating MPI, deprivation score (0 or 1) is assigned for every indicator. Ten indicators measure poverty in three dimensions. Any household that is deprived in 1/3rd of composite indicators is treated as deprived household. Afterwards with the help of weighted indicators headcount ratio and intensity of poverty is

measured. Then MPI is calculated by multiplying headcount ratio and intensity of poverty.

$$MPI = H \times A \quad (4.1)$$

where,

MPI = Multidimensional Poverty Index
H = Headcount Ratio
A = Intensity of Poverty

Headcount ratio represents incidence of multidimensional poverty and measured as,

$$H = q/n \quad (4.2)$$

where q represents number of people in poor households and n is total population.

Intensity of poverty represents average weighted deprivation of poor. It is the fraction of indicators in which average multidimensional poor person is deprived.

$$A = \sum_1^n c_i/q \quad (4.3)$$

where c represents weighted indicators in which poor person is deprived and q is total number of poor.

MPI is computed with the help of data of MICS (2012) that is household level survey data collected by Punjab Bureau of Statistics. MICS is useful representative of household survey that covers data from 102545 households having 597462 individuals from all 36 districts of Punjab it provide data for more than hundred indicators with response rate of 97 percent.

4.3 DETERMINANTS OF MPI

Present research also observed some possible determinants of MPI across the districts of Punjab. Multiple factors can be responsible for poverty in Punjab such as low living standard, poor infrastructure, unemployment, inflation, poor health and education facilities, population density and primitive tools and plant used in cultivation and in manufacturing sectors. In this study access to health facilities, education facilities, remittances and population

density have been considered. The input factors such as education facilities and health facilities can be responsible for decrease in multidimensional poverty. Remittances can increase the standard of living and purchasing power of households. Whereas, people in highly dense areas have access to more opportunities to earnings and also enjoy better facilities. The description of independent variables and their data sources are described as under:

4.3.1 Access to Health Facilities

The physical access to health facilities (AHF) is measured as a percentage of people having access to health facility within half an hour distance. Data for access to health facilities is taken from Punjab Development Statistics (2011). In present study percentage of access to health facilities in Chiniot and Jhang district is supposed as same because when they were one district at the time of data collection.

$$\text{AHF} = \frac{Households\ having\ access\ to\ health\ facilities\ in\ District\ i}{Total\ Households\ in\ District\ i} \times 100 \qquad (4.4)$$

4.3.2 Education Infrastructure

Education is long run investment for the development in human capital. It is deemed as life blood of every economy. In present research we have considered Education Infrastructure (EI) as determinant of MPI. EI is measured by using Principal Component Analysis (PCA) on number of educational institutions. Because, PCA gives relevant weightage to all the variables. It a method that retains maximum information of data though reducing the multidimensional data into lower dimensions. We have used number of government primary schools, number of government middle schools, number of government high schools, number of government and private higher secondary schools, number of intermediate and degree (science and arts) colleges of Punjab government, Federal government, PAF and private organizations. Data for number of educational institutions is taken from Punjab Development Statistics (2012) which have data of educational institutions for year 2011.

4.3.3 Remittances

Remittances (REM) are the amounts transferred to the households from other regions of Pakistan or from other countries. In this study we have taken percentage of households receiving remittances. In MICS (2011) data for foreign and domestic remittances is collected. Foreign remittances represent the amounts received from any other country whereas domestic remittances includes transfer of amount to a district from other any other district of Pakistan. For the purpose of present research we have considered both remittances (Domestic and foreign) by summing the percentages of households receiving remittances.

$$\text{REM} = \frac{Households\ receiving\ remittances\ in\ District\ i}{Total\ Househlods\ in\ District\ i} \times 100 \qquad (4.5)$$

4.3.4 Population Density

Population density (PD) is calculated by dividing total population by area (square kilometer) of respective district. In present study population is taken that is based on population projection on the basis of population census of 1998. We have used PD as thousand persons per square kilometer. Data for calculation of PD is taken from Statistical Pocket Book of the Punjab (2011) which is published by Bureau of Statistics Government of Punjab, Pakistan.

$$\text{AHF} = \frac{Total\ Population\ of\ District\ i(Thousand\ Persons)}{Total\ Area\ of\ District\ i\ (Sq.KM)} \qquad (4.6)$$

Table 4.3
Pair-wise Correlation Matrix

Variables	MPI	EINF	AHF	REM	PD
MPI	1.000				
EINF	(-0.343)**	1.000			
AHF	(-0.679)***	(0.341)**	1.000		
REM	(-0.475)***	(0.051)	(0.387)**	1.000	
PD	(-0.418)**	(0.385)**	(0.403)**	(-0.223)	1.000

* = 10 percent significance level,
** = 5 percent significance level and
*** = 1 percent significance level

Source: Author's Calculations

Table 4.3 shows the pair wise correlation between the dependent variable and all independent variables. If independent variables are highly correlated that represent the presence of multicollinearity. Table 4.3 represent that there is no case of high and significant correlation between the independent variables that reflect the absence of multicollinearity. So far as the pair wise correlation between dependent and independent variables is concerned. Correlation between MPI and AHF is significant at 1 percent level of significance similarly correlation between MPI and REM is also significant at 1 percent level of significance. The results of Pair wise correlation further reflect that correlation between MPI and EINF and between MPI and PD is significant at 5 percent level of significance.

CHAPTER 5

EMPIRICAL RESULTS AND DISCUSSION

5.1 MULTIDIMENSIONAL POVERTY INDEX

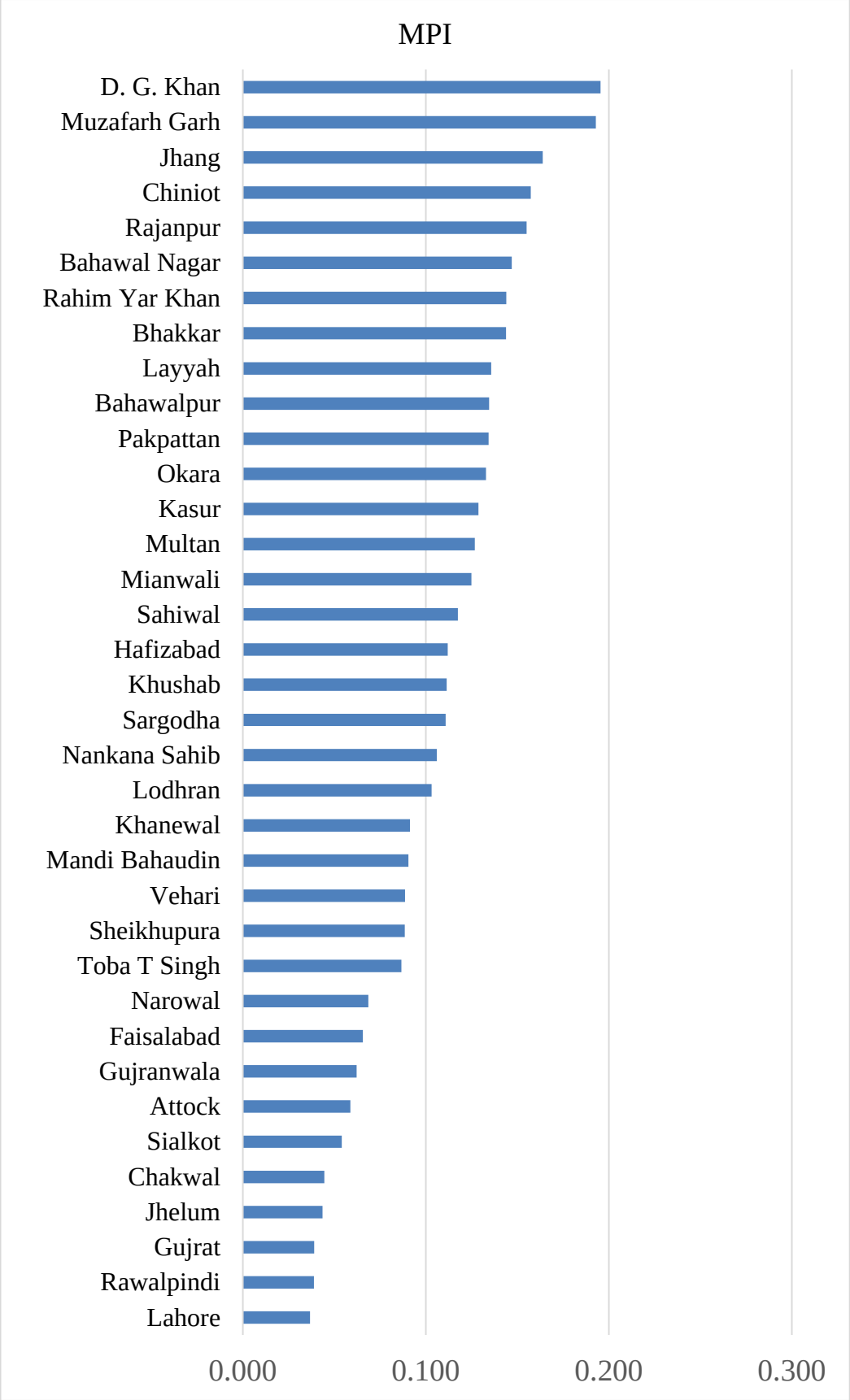
In present chapter empirical results are discussed. The district wise rankings and values of MPI across thirty-six districts of Punjab province are calculated. Similarly, district wise rankings with respect to headcount ratio are also evaluated where headcount ratio is calculated by using threshold line of 33.33 percent from the sum of weighted indicators. So far as the determinants of MPI are concerned there are multifaceted factors that are held responsible for poverty. We have considered Access to Health Facilities, Education Infrastructure, Remittances and Population Density as important determinants of MPI.

Table 5.1 shows MPI and its ranking across thirty six districts of Punjab. Rank one represents lowest poverty and rank thirty-six represents highest poverty. Bottom up ranking can be observed in Figure 5.1. We can observe that mostly major cities are facing less poverty. It may be because of more facilities and opportunities available in the big cities. These cities also have comparatively improved physical, social and educational infrastructure. Table 5.1 shows that Lahore have smallest MPI that is 0.037 with 0.408 as intensity of poverty and headcount ratio of 0.09. Headcount ratio implies that in Lahore 9 percent households are living below poverty line and intensity of poverty implies that average poor person is deprived in 40.8 percent of weighted indicators. Whereas Dera Gazi Khan have highest MPI that is 0.196 with 0.451 as intensity of poverty and headcount ratio of 0.434. In Dera Gazi Khan intensity of poverty is slightly more than Lahore but the head count ratio reflects high poverty up to 43.4 percent. The top five districts with respect to MPI are Lahore, Rawalpindi, Gujrat, Jhelum and Chakwal respectively. The district having more poverty (MPI) and ranked in lowest five are Dera Gazi Khan, Muzafar Garh, Jhang, Chiniot and Rajanpur.

Table 5.1
Multidimensional Poverty Index of the Districts

Sr.No.	Districts	MPI	Rank w.r.t MPI
1	Bahawalpur	0.135	27
2	Bahawal Nagar	0.147	31
3	Rahim Yar Khan	0.144	30
4	D. G. Khan	0.196	36
5	Layyah	0.136	28
6	Muzafarh Garh	0.193	35
7	Rajanpur	0.155	32
8	Faisalabad	0.066	9
9	Chiniot	0.157	33
10	Jhang	0.164	34
11	Toba Tek Singh	0.087	11
12	Gujranwala	0.062	8
13	Gujrat	0.039	3
14	Hafizabad	0.112	20
15	Mandi Bahaudin	0.090	14
16	Narowal	0.069	10
17	Sialkot	0.054	6
18	Lahore	0.037	1
19	Kasur	0.129	24
20	Nankana Sahib	0.106	17
21	Sheikhupura	0.088	12
22	Multan	0.127	23
23	Khanewal	0.091	15
24	Lodhran	0.103	16
25	Vehari	0.089	13
26	Sahiwal	0.117	21
27	Pakpattan	0.134	26
28	Okara	0.133	25
29	Rawalpindi	0.039	2
30	Attock	0.059	7
31	Chakwal	0.045	5
32	Jhelum	0.044	4
33	Sargodha	0.111	18
34	Bhakkar	0.144	29
35	Khushab	0.111	19
36	Mianwali	0.125	22

Source: Author’s Calculation



ure 5.1: District wise Ranking with respect to MPI

Figure 5.1 represents ranks of 36 districts of Punjab with respect to MPI. Lower value of MPI reflects relatively less poverty and higher value of MPI represents high poverty. It can be seen from Figure 5.1 that major cities i.e. Lahore, Rawalpindi, Gujrat and Jhelum have low poverty compared with small cities. Similarly districts from south Punjab region face high poverty if compared with districts of north Punjab regions.

Ranking of Districts of Punjab with respect to Headcount Ratio is presented in Table 5.2. Rank one represents lowest poverty and rank thirty six represents highest poverty. Headcount ratio indicate the incidence of poverty as it is measured through dividing number of poor people by total population of respective district. Table 5.2 shows that Lahore has lowest headcount ratio that is 0.0902 it represents that 9.02 percent household members are multidimensionally poor in Lahore district. Headcount ratio in district Lahore is followed by Gujrat, Rawalpindi, Jhelum and Chakwal in the upper five districts. Whereas Muzafarh Garh has worst incidence of poverty that is 0.4381 which shows 43.81 percent household members are living below poverty cut-off line of 33.33 percent. With respect to headcount ratio district Muzafarh Garh followed by Dera Gazi Khan, Jhang, Chiniot and Rajanpur in the least five districts.

Table 5.2 also includes intensity of poverty in all districts of Punjab. Intensity of poverty measures, on average, that how much poor people are deprived in the weighted indicators. In present study, district Chakwal has lowest intensity of poverty that is 0.3952 which means, on average, the poor people in Chakwal are deprived in 39.52 percent of the weighted indicators. Similarly, district Dera Ghazi Khan have highest intensity of poverty that is 0.4508 which represents that, on average, poor people in Dera Ghazi Khan are deprived in 45.08 percent of the weighted indicators.

Table 5.3 shows MPI calculated by UNDP by using data of PSLM. They have measured multidimensional poverty by using sixteen indicators for three dimensions that is education, health and standard of living. If we compare results of MPI in Table 5.1 and Table 5.3 Lahore is considered as most less poor in both results. Similarly district Rawalpindi, Jhelum, Attock, Chakwal, Sialkot, Gujranwala, Gujrat, Faisalabad and Sheikhupura are in less poor ranking in both the tables. Whereas district Layyah, Lodhran, Mianwali, Bhawalnagar, Bhakkar, Bahawalpur, Rahim Yar Khan, Muzaffargarh, D.G. Khan and Rajanpur are in high poor ranking in both Table 5.1 and 5.3. District Jhang and Chiniot are reported in poorer category only in Table 5.1.

Table 5.2
Head Count Ratio Across the Districts of Punjab

S.No.	District	Intensity of Poverty	Head Count Ratio	Rank (Based on Headcount Ratio)
1	Bahawalpur	0.4361	0.3084	26
2	Bahawal Nagar	0.4444	0.3306	30
3	Rahim Yar Khan	0.4375	0.3290	29
4	D. G. Khan	0.4508	0.4337	35
5	Layyah	0.4370	0.3105	27
6	Muzafarh Garh	0.4402	0.4381	36
7	Rajanpur	0.4343	0.3572	32
8	Faisalabad	0.4167	0.1575	9
9	Chiniot	0.4360	0.3609	33
10	Jhang	0.4347	0.3772	34
11	Toba T Singh	0.4088	0.2121	13
12	Gujranwala	0.4190	0.1484	8
13	Gujrat	0.4064	0.0959	2
14	Hafizabad	0.4250	0.2634	20
15	Mandi Bahaudin	0.4363	0.2073	11
16	Narowal	0.4267	0.1607	10
17	Sialkot	0.4202	0.1287	6
18	Lahore	0.4080	0.0902	1
19	Kasur	0.4382	0.2939	24
20	Nankana Sahib	0.4275	0.2478	16
21	Sheikhupura	0.4228	0.2093	12
22	Multan	0.4326	0.2930	22
23	Khanewal	0.4163	0.2196	15
24	Lodhran	0.4091	0.2523	17
25	Vehari	0.4135	0.2143	14
26	Sahiwal	0.4376	0.2684	21
27	Pakpattan	0.4257	0.3155	28
28	Okara	0.4379	0.3036	25
29	Rawalpindi	0.3981	0.0976	3
30	Attock	0.4071	0.1444	7
31	Chakwal	0.3952	0.1128	5
32	Jhelum	0.4181	0.1 043	4
33	Sargodha	0.4327	0.2561	18
34	Bhakkar	0.4150	0.3465	31
35	Khushab	0.4291	0.2597	19
36	Mianwali	0.4252	0.2938	23

Source: Author's Calculation

Table 5.3
MPI for Districts of Punjab by UNDP

S.No.	District	MPI	Head Count Ratio (%)	Intensity of Poverty (%)
1	Attock	0.041	9.9	41.1
2	Bahawalnagar	0.244	50.1	48.7
3	Bahawalpur	0.273	53.0	51.5
4	Bhakkar	0.255	51.7	49.3
5	Chakwal	0.056	12.9	43.6
6	Chiniot	0.199	42.1	47.4
7	D.G. Khan	0.351	63.7	55.1
8	Faisalabad	0.086	19.4	44.5
9	Gujranwala	0.064	14.0	45.6
10	Gujrat	0.078	18.4	42.1
11	Hafizabad	0.152	32.3	47.0
12	Jhang	0.196	41.6	47.2
13	Jhelum	0.035	8.5	40.7
14	Kasur	0.095	21.9	43.6
15	Khanewal	0.189	39.9	47.4
16	Khushab	0.200	40.4	49.7
17	Lahore	0.017	4.3	38.8
18	Layyah	0.214	45.6	46.9
19	Lodhran	0.230	46.8	49.2
20	Mandi Bahauddin	0.147	31.5	46.7
21	Mianwali	0.239	46.9	50.8
22	Multan	0.173	35.7	48.5
23	Muzaffargarh	0.338	64.8	52.1
24	Nankana Sahib	0.110	24.6	44.6
25	Narowal	0.118	26.6	44.3
26	Okara	0.185	39.5	47.0
27	Pakpattan	0.189	42.6	44.4
28	Rahim Yar Khan	0.289	56.8	50.8
29	Rajanpur	0.357	64.4	55.4
30	Rawalpindi	0.032	7.5	43.0
31	Sahiwal	0.140	30.8	45.6
32	Sargodha	0.166	35.4	46.8
33	Sheikhupura	0.093	21.4	43.5
34	Sialkot	0.059	14.0	41.8
35	T.T. Singh	0.107	23.8	45.0
36	Vehari	0.200	41.9	47.6

Source: UNDP (2014).

5.2 MODELLING FRAMEWORK

Socioeconomic and demographic characteristics can be considered as major determinants of poverty across districts of Punjab. In present study we have investigated the dependence of MPI on population density, remittances, education infrastructure and access to health facilities Furthermore, industrialization, urbanization, employment rate, dependency ratio, physical infrastructure and distance from provincial capital can also be considered as major determinants of poverty across the districts of Punjab.

$$MPI_i = C + \beta_1 AHF_i + \beta_2 EINF_i + \beta_3 REM_i + \beta_4 PD_i + e_i \qquad (5.1)$$

where,

$i = 1, 2, 3, 4, \ldots\ldots, 36.$

MPI_i = Multidimensional Poverty Index of i^{th} district
AHF_i = Access to Health Facilities in i^{th} district
$EINF_i$ = Education Infrastructure in the i^{th} district
REM_i = Remittances received in i^{th} district
PD_i = Population Density of i^{th} district
e_i = Error terms
C = Constant

Analysis are based on cross-sectional data therefore there is no need of stationary checks. Said et al. (2011) used Ordinary Least Square methodology to investigate factors for poverty in Pakistan.

The estimated multiple regression function is given below:

$$\begin{aligned} MPI = {} & 0.224474263392 \\ & - 0.00106221848404 * AHF_i \\ & - 0.00158332435981 * EINF_i \\ & - 0.00215930613184 * REM_i \\ & - 0.0182378054568 * PD_i \end{aligned} \qquad (5.2)$$

Table 5.4
Determinants of MPI

DEPENDENT VARIABLE = MPI			
Variable	**Coefficient**	**T-Statistic**	**Prob-Value**
AHF	-0.001062	-2.445585	0.0203
EINF	-0.001583	-0.547664	0.5878
REM	-0.002159	-2.960987	0.0058
PD	-0.018238	-2.337926	0.0260
Constant	0.224474	8.437930	0.0000
F-statistic = 11.82936			
Probability (F-statistic) = 0.000006			
R-squared = 0.604175			
Adjusted R-squared = 0.553101			
Durbin-Watson stat = 1.553779			

Source: Author's Calculation

Table 5.4 represent the results of regression analysis by using ordinary least square method (OLS). Results of OLS estimations represents that Physical access to Health Facility (AHF), Remittances (REM) and Population Density (PD) have negative and statistically significant impact on MPI. Whereas, Education Infrastructure (EINF) is negatively but statistically insignificantly affecting MPI. The results also show that AHF, REM and PD are statistically significant at 5 percent level of significance. Probability value of F-statistics represents that the model is overall good fit. Empirical results also suggest that null hypothesis H_{01}, H_{03} and H_{04} are rejected whereas H_{02} is accepted but its regression is insignificant.

5.2.1 Diagnostic Tests

Diagnostic tests are applied to the residuals. In order to investigate whether data is normally distributed? Normality test is applied in Figure 5.2. To detect the problems of Heteroskedasticity, serial correlation and model specification errors. Results of diagnostic tests are shown in Table 5.5. QUSUM and QUSUMSQ Tests relating to stability of coefficients are shown in Figure 5.3 and Figure 5.4. At the end pair-wise correlation is taken in Table 4.3.

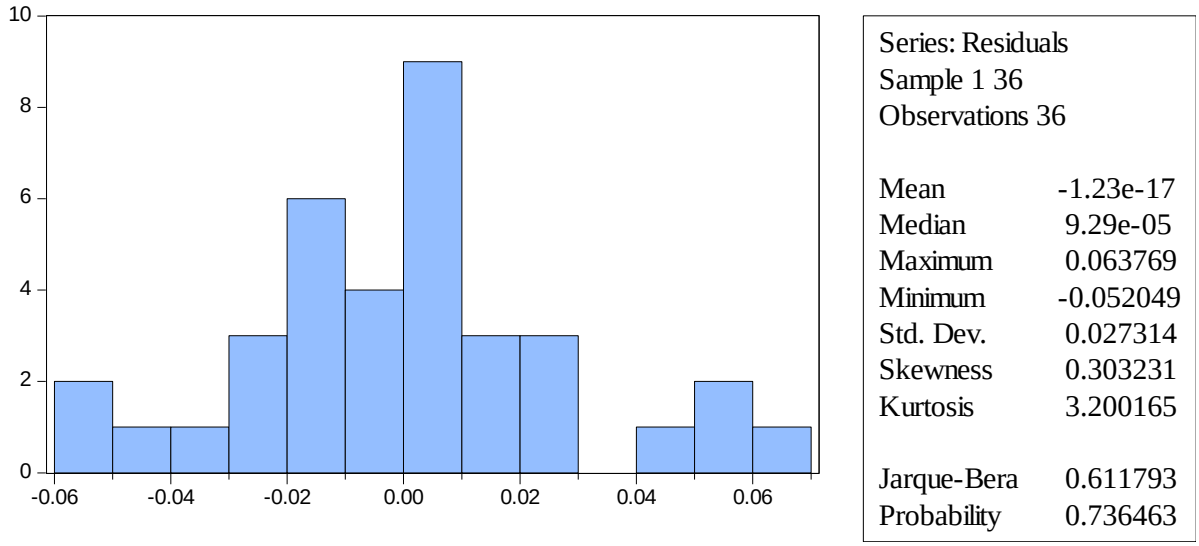


Figure 5.2: Normality Test

Figure 5.2 represent the normality test which show that the residuals are normally distributed. Jarque-Bera static have insignificant probability that represent there are no issues relating to normality. The asymmetry of the distribution is measured by skewness above distribution has 0.303 skewness which represent that distribution is neither highly positively nor negatively skewed. Kurtosis measures whether the distribution is peaked of flat as compared with normal distribution. The Figure 5.2 show that kurtosis represent normal distribution. So the distribution is neither leptokurtic nor platykurtic.

Table 5.5
Diagnostic Tests

Normality Test		
Jarque-Bera Statistic	0.611793	Probability = 0.7364
Heteroskedasticity Test		
Breusch-Pagan-Godfrey Test	F-statistic = 0.914460	Probability = 0.4679
Serial Correlation		
Breusch-Godfrey Serial Correlation LM Test	F-statistic = 1.250858	Probability = 0.3012
Ramsey RESET Test Omitted Variables: Squares of fitted values		
T-statistic = 0.292241	df = 30	Probability = 0.7721
F-statistic = 0.085405	df = (1, 30)	Probability = 0.7721
Likelihood ratio = 0.102340	df = 1	Probability = 0.7490
F-test Summary		
Test SSR = 7.41E-05	df = 1	Mean Squares = 7.41E-05
Restricted SSR = 0.026112	df = 31	Mean Squares = 0.000842
Unrestricted SSR = 0.026038	df = 30	Mean Squares = 0.000868

Source: Author's Calculation

Table 5.5 shows various diagnostic tests relating to error term. The results of above diagnostic tests show that residuals are normally distributed and there is no problem regarding Heteroskedasticity and Serial Correlation. The model is also free from problems of Model specification errors.

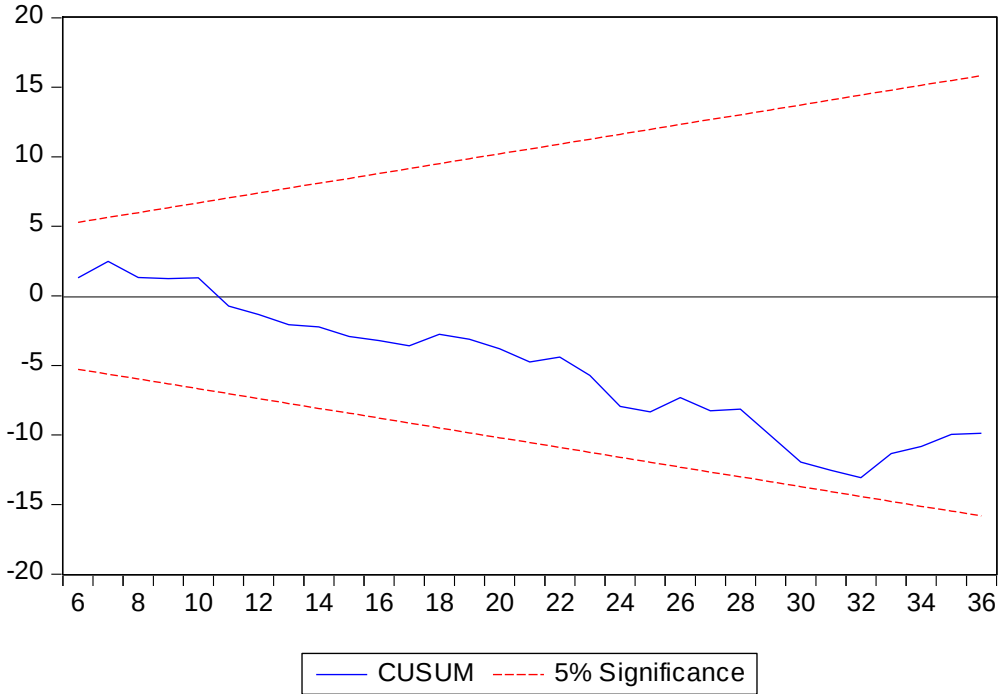


Figure 5.3: Cumulative Sum of Recursive Residuals (CUSUM)

Figure 5.3 represents the Cumulative Sum of Recursive Residuals (CUSUM). The straight lines represent the critical bounds at 5 percent level of significance.

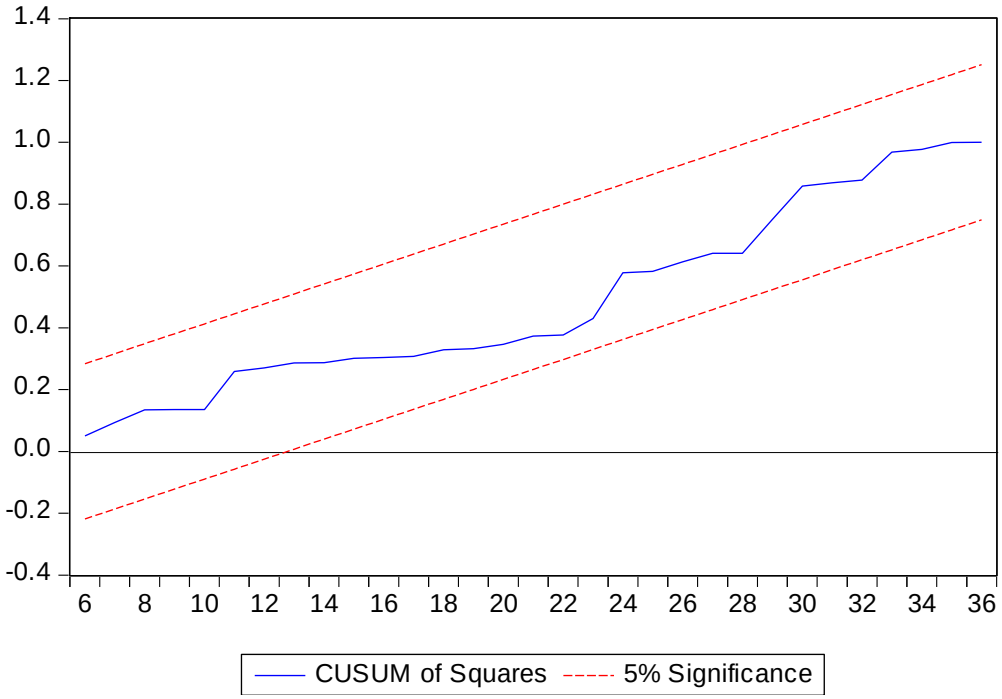


Figure 5.4: Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ)

Graphical demonstration of the Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ) is shown in Figure 5.4. The straight lines represent the critical bounds at 5 percent level of significance. Figure 5.3 CUSUM and Figure 5.4 CUSUMSQ are plotted to check the stability of coefficients. Here the null hypothesis is that all the parameters are stable. The plots of both figures are lying within the critical bound of 5 percent level of significance. This implies that we cannot reject null hypothesis and the estimated parameters are stable (Brown et al. 1975). Thus the there is no structural instability in the estimated model.

CHAPTER 6

CONCLUSION AND POLICY IMPLICATIONS

Present study has been conducted to explore the current status of poverty by using MPI in Punjab province. This study also explore the possible socio-economic determinants of MPI across the districts of Punjab. For this purpose present study examine the relationship of MPI with Access to Health Facilities (AHF), Education Infrastructure (EI), Remittances (REM) and Population Density (PD) out of several possible determinants of poverty. Cross sectional data from MICS (2012) for thirty six districts of Punjab have been utilized for this purpose.

In first part of study MPI across the districts of Punjab is measured. Results in Table 5.1 show that MPI varies across the districts. When people does not have equal opportunities to access the facilities it can create distrust among the different regions that can also be dangerous for social cohesion. The virtuous cycle can be in the country if economic growth and different opportunities such as health, employment and education are evenly distributed among the people (Pervaiz and Chaudhary, 2010). According to MPI results, districts ranked in top ten are Lahore, Rawalpindi, Gujrat, Jhelum, Chakwal, Sialkot, Attock, Gujranwala, Faisalabad and Narowal. Whereas districts ranked in bottom ten are Bahawalpur, Layyah, Bhakkar, Rahim Yar Khan, Bahawal Nagar, Rajanpur, Chiniot, Jhang, Muzafarh Garh and D. G. Khan.

Figure A.1 in appendix represent the district wise map of Punjab province. In the map districts of Punjab are colored from dark red color to light red color with respect to ranks of MPI. Here dark red represent highest MPI and light red color shows lowest MPI. If we analyze from Figure A.1 in Appendix-A it shows that all districts in the top ten category are situated in northern Punjab region. Figure A.1 also show that all districts in the bottom ten are situated in southern Punjab region. So it can be concluded that multidimensional poverty in the southern Punjab is higher than multidimensional poverty in the northern Punjab regions.

After investigating the headcount ratio and MPI across the districts of Punjab. Present study also explored the determinants of MPI across the districts of Punjab. According to the results, AHF, PD and REM have negative and statistically significant impact on MPI, therefore, we can reject the null hypothesis H_{01}, H_{03} and H_{04}. EINF also have negative relationship with MPI but that relationship is statistically insignificant.

According to ranking of districts with respect to MPI, it is observed that multidimensional poverty varies across the districts. In order to eradicate poverty various policy measures are required by the government of Punjab. Present study suggests following policy measures based upon the empirical results.

Access to Health facilities have negative and statistically significant relationship with MPI. It suggest that government should provide easy access to health facilities to every citizen. Because adequate health facilities benefit the economy in variety of ways, such as it reduce infant mortalities, increase life expectancy and improves quality of manpower. So government should increase health expenditures and health facilities should be provided in every district it will also control internal migration.

Population density have negative and statistically significant impact on MPI. The possible reason for this relationship can be that more populated areas have more opportunities. But that does not suggest that increase in population density should be encouraged in order to reduce poverty. Population density is increasing in the big districts due to internal migration. So Government should provide all basic facilities in all the districts so that internal migration will be controlled.

Remittances also have negative and statistically significant impact on MPI across the districts of Punjab. Remittances in present study include domestic and foreign remittances. Remittances help the economy in dual way, on the one hand it uplift the unemployment pressure from the household and on the other hand it supplement the household income. By more income household have better standard of life. Remittances enable the households to take initiatives for personal business and investments this can also raise the chances of future income as well.

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APPENDIX-A

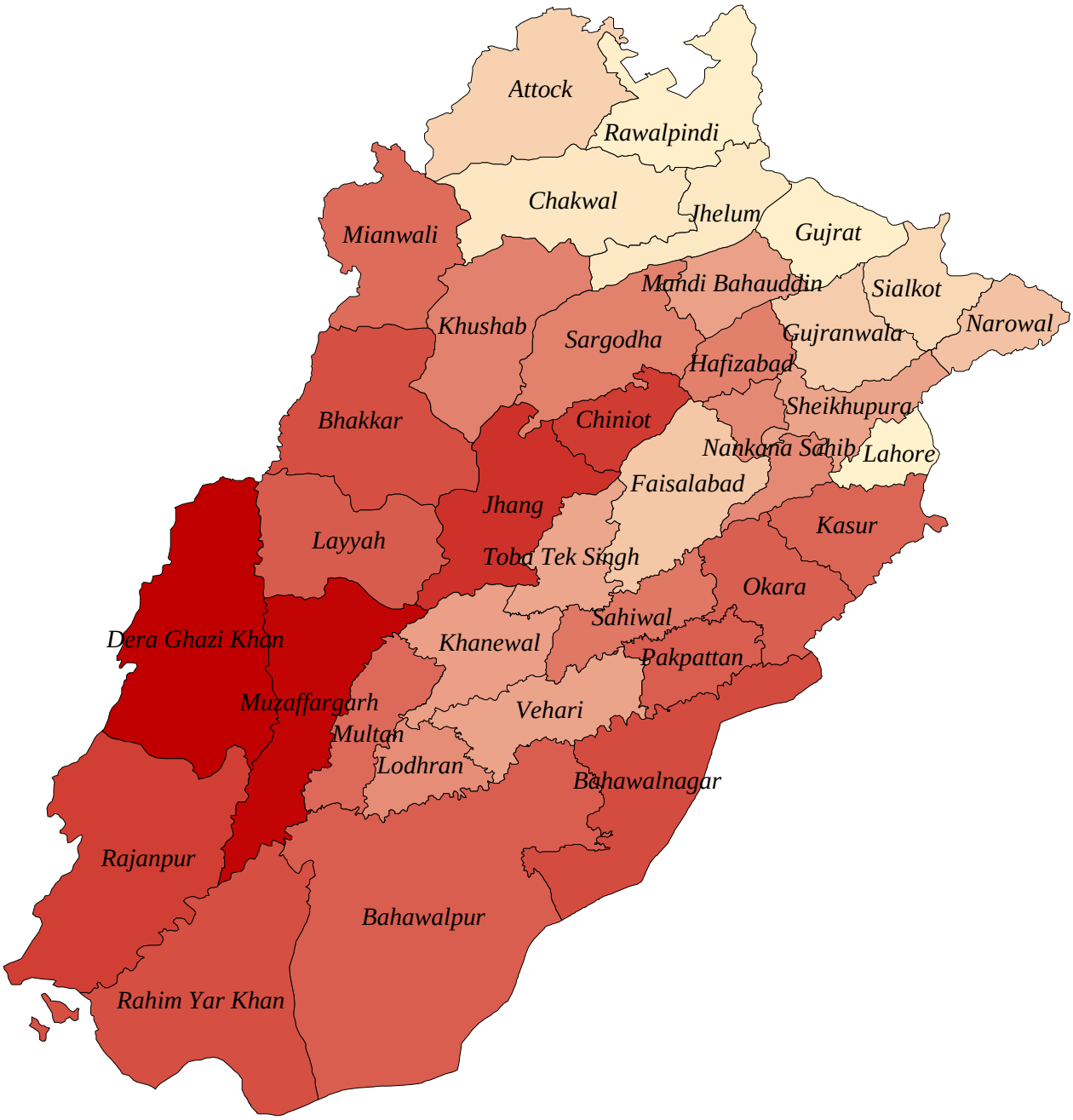

Figure A.1: Map of Districts of Punjab

Table A-1
DATA

Sr. No.	Districts	Access to Health Facilities (percent)	Remittance (percent)
1	Bahawalpur	64	9.9
2	Bahawal Nagar	51	9.3
3	Rahim Yar Khan	55	8.4
4	Dera Ghazi Khan	59	12.6
5	Layyah	58	11.2
6	Muzafarh Garh	57	8.6
7	Rajanpur	47	2.7
8	Faisalabad	90	13.9
9	Chiniot	67	9.6
10	Jhang	67	14.9
11	Toba Tek Singh	69	24.2
12	Gujranwala	96	10.4
13	Gujrat	94	32.9
14	Hafizabad	92	8.2
15	Mandi Bahaudin	77	18.4
16	Narowal	90	22
17	Sialkot	83	20.7
18	Lahore	92	3.7
19	Kasur	70	3.5
20	Nankana Sahib	76	8
21	Sheikhupura	78	6.9
22	Multan	72	7
23	Khanewal	70	6.2
24	Lodhran	51	4.2
25	Vehari	81	11
26	Sahiwal	89	10.2
27	Pakpattan	41	9.1
28	Okara	70	3.4
29	Rawalpindi	82	11.5
30	Attock	61	21.4
31	Chakwal	82	31.3
32	Jhelum	87	29.6
33	Sargodha	89	22.5
34	Bhakkar	63	12
35	Khushab	79	24.2
36	Mianwali	59	17.1

Table A-2
DATA

Sr. No.	Districts	Education Infrastructure Index	Population Density (1000 Persons/Sq. KM)
1	Bahawalpur	0.762521	0.131977
2	Bahawal Nagar	1.438972	0.293197
3	Rahim Yar Khan	2.184877	0.360185
4	Dera Ghazi Khan	-0.692518	0.189817
5	Layyah	-0.993757	0.240661
6	Muzafarh Garh	0.239952	0.44272
7	Rajanpur	-2.31599	0.12291
8	Faisalabad	5.716115	1.182377
9	Chiniot	-2.693684	0.442679
10	Jhang	0.241543	0.376906
11	Toba Tek Singh	0.427033	0.612854
12	Gujranwala	1.277502	1.23661
13	Gujrat	0.722715	0.796366
14	Hafizabad	-2.49689	0.43853
15	Mandi Bahaudin	-1.768991	0.520763
16	Narowal	-1.19766	0.655113
17	Sialkot	0.995305	1.146883
18	Lahore	2.460239	4.98307
19	Kasur	-0.236705	0.766959
20	Nankana Sahib	-1.752758	0.557353
21	Sheikhupura	-0.613883	0.820481
22	Multan	1.134963	1.091398
23	Khanewal	0.641208	0.603127
24	Lodhran	-1.835457	0.550396
25	Vehari	-0.479512	0.622136
26	Sahiwal	0.336829	0.709466
27	Pakpattan	-2.267849	0.602423
28	Okara	-0.394607	0.644962
29	Rawalpindi	3.997068	0.83141
30	Attock	0.354473	0.230859
31	Chakwal	0.317347	0.20141
32	Jhelum	-1.45903	0.320045
33	Sargodha	3.006853	0.551247
34	Bhakkar	-1.572716	0.167791
35	Khushab	-1.875056	0.169713
36	Mianwali	-1.608451	0.227397