

INCIDENCE OF POVERTY ACROSS AGRO-CLIMATIC REGIONS OF PAKISTAN

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ABSTRACT: *An accurate measurement of the incidence and severity of poverty across Pakistan can be invaluable to researchers and policy makers alike. The variations in levels of poverty across the zones can shed light on the various factors that may be at work while determining poverty and this information ultimately helps find viable strategies for poverty alleviation, especially in those areas that record high levels of poverty. This may be especially useful also because official estimates have been known to be misleading. The present study made use of data from HIES PSLM for the year 2007-08 while calculating poverty across the nine agro climatic zones of Pakistan namely Rice/Wheat Punjab, Mixed Punjab, Cotton/Wheat Punjab, Low Intensity Punjab, Barani Punjab, Cotton/Wheat Sindh, Rice Other Sindh, Khyber Pukhtunkhwa and Balochistan. The method employed made use of consumption as the welfare indicator. The consumption aggregate was then adjusted and three measures of poverty calculated; the headcount ratio, average poverty gap and the squared poverty gap. Our results indicated that the highest level of poverty was seen in Balochistan. This was followed by Low Intensity Punjab. The lowest levels of Poverty were seen in the Barani Zone of Punjab. Similar trends were observed for the severity of poverty in the zones.*

INTRODUCTION

Poverty is generally defined as lacking a certain amount of possessions or money and thus being deprived of basic human needs. Poverty may be measured as absolute, subjective or relative poverty. Absolute poverty may be described as a set minimum standard of resources which are needed to survive and are consistent over time and countries. Relative poverty is a matter of social equity and varies with the central tendency of the distribution of living standards. Absolute poverty lines usually remain fixed and are adjusted according to inflation while Relative poverty lines use a relative measure to define property. There are two main methods of estimating a poverty lines cost of basic needs and the caloric intake method.

The cost of Basic Needs approach considers the absolute minimum resources necessary to obtain a set of goods to fulfill basic needs like food (including water, clothing and shelter). Modern lists also include importance or healthcare, education and sanitation. The basic needs approach emphasizes on getting a society to rise just above poverty level and to meet its prime requirements. It does not set goals for helping create a sustainable society in the future.

The caloric intake method sets a poverty line according to the consumption expenditures or income levels just sufficient for a person to meet predetermined food requirement. Absolute poverty consists of excessive deprivation, hunger and premature death and its measurement might not be in complete consistence in reality as the dividing line between acceptable and unacceptable deprivation is dynamic in different societies. Relative poverty is measured as poverty of parts of population in relation to others. Subjective poverty focuses on assessment of one's level of income such that it is felt to be less than the minimum criteria defined by the society. Classification therefore is difficult and variable even with people of the same income as it relies upon question's wording and the different methods for derivation. A poverty line is set as a minimum level of income or expenditure below which if a household falls it classified as poor. There are many other factors to be taken in account when setting up the caloric – intake approach such as different consumption costs according to varying living standards, relative prices and other such factors. Thus, for

solving these issues, separate poverty lines are set for urban and rural areas.

This study describes the incidence of poverty in rural Pakistan and expresses the values of the three indices of poverty: headcount, poverty gap and severity of poverty across the nine agro climatic zones of Pakistan.

Researchers [1] used the 2000-01 HIES data to calculate headcount ratios for rural areas throughout Pakistan and by provinces. The results indicated that rural poverty in 2000-01 was 42.9 percent. Their results listed Sindh to be the poorest among the provinces following which were Khyber Pakhtunkhwa and finally Baluchistan. Punjab had considerably lesser rural poverty than the other provinces. The authors argued that rural poverty in Pakistan can be largely explained in terms of rural landlessness and that there is a strong correlation between poverty and the lack of assets. This was evident from the observation that 54.6 percent of the landless households were poor. Poverty had an inverse relationship with land holdings as poverty decreased rapidly with increase in land amount of land owned until disappearing altogether with possession of land greater than two hectares. It was also observed that there was an extreme degree of inequality in the distribution of land and the poverty gap and severity both recorded high values.

The Social Policy Development Centre (SPDC) estimated the spatial distribution of poverty by provinces in rural areas using the 2001-2002 HIES data and the results they obtained showed somewhat similar trends. They found that the headcount ratio was the greatest in Baluchistan at 51 percent of the population below the poverty line followed by Sindh at 38 percent, 27 percent of the population of rural Khyber Pukhtunkhwa fell below the poverty line while in Punjab the incidence of poverty was lowest at 24 percent. The Center for Research on Poverty Reduction and Income Distribution (CRPRID) also analyzed the same data and found that Khyber Pukhtunkhwa rated highest in terms of poverty in 2001-02 (41.5 percent) while poverty was the lowest in Punjab (32). Sindh and Balochistan had almost equal levels of poverty that were in between those noted for Khyber Pakhtunkhwa and Punjab. It was noted that poverty had been on the rise from 1992-93 to 2001-02 and this was especially

true for Sindh and Balochistan which had been affected by a devastating flood in between this time.

MATERIALS AND METHODS

The initial step for setting up measuring poverty is setting up a welfare indicator, based on survey data. Income and consumption are the main options, consumption being thought of in many arguments as a better option in developing countries as it is less variable and as suggested by theories individuals tends to smooth their consumption across times of high and low incomes through borrowing and saving. Consumption is also thought of as a more focused indicator of fulfillment of basic needs and achievement. Respondents might also show reluctance in giving exact income details and many are employed in agriculture of family businesses where individual incomes measurements prove to be inaccurate. Income is, nonetheless used as a measure of welfare in developed countries.

The next step is the adjustment of consumption aggregate. The household consumption aggregate has to be adjusted according to the household size and its composition as expenditures are calculated at household levels but welfare is estimated individually. An aggregate household composition might provide an inaccurate result of the individual welfare of a given household. Household income or consumption is generally divided into individual continents to account for household demographic differences. This method is not ideal as there might be two households with the same income, consumption and the number of individuals. Both the households would be classified according to equal welfare ranking even if one of the household is dominated by adults while the other with children. Nutrition based adult equivalent scales may be used to convert the number of persons to adult equivalents based on age and sex. The aggregator is now to be decided for poverty analysis. The three indices for measuring poverty proposed by Foster, Greer and Thorbeck [2] are used here. The poverty measures used are the headcount ratio, average poverty gap and the squared poverty gap.

The geographical diversity of Pakistan means that varying cropping patterns are observed in the country depending on the topology, climate and availability of water for irrigation. There are basically two cropping seasons in Pakistan – Kharif and Rabi. Kharif crops harvested in summer include rice, cotton, maize, sorghum, and sugarcane while in Rabi the winter season, wheat, barley, oilseeds and gram are grown. To allow for geographical variations, the country is divided into nine agro-climatic zones depending upon the relief and the nature of agricultural activity following Pickney [3]. This classification is based primarily on the Kharif cropping patterns as wheat is the primary Rabi crop in all zones. Pickney has not disaggregated the provinces of Balochistan and Khyber Pakhtunkhwa despite varied geographical terrain due to their low contribution to agriculture. A brief description of each of these zones is given below together with the districts included. This is in line with the third objective of the research.

Rice/Wheat Punjab

This zone includes the districts of Sialkot, Gujrat, Gujranwala, Sheikhupura, Lahore, Kasur, Narowal, Mandi Bahauddin, and Hafizabad. It is well irrigated, and the soil is of good quality permitting cultivation of the water intensive Basmati rice as kharif crop together with wheat in Rabi season.

Mixed Punjab

Sargodha, Khushab, Jhang, Faisalabad, Toba Tek Singh, and Okara form this zone where no one crop dominates completely. Cotton, sugarcane (particularly in Faisalabad), maize, and pulses are grown in this cropping zone. It is well irrigated by the tributaries of Indus.

Cotton/Wheat Punjab

Sahiwal, Bahawalnagar, Bahawalpur, Rahim Yar Khan, Multan, Vehari, Lodhran, Khanewal, and Pakpattan form the cotton belt of Punjab. The drier weather encourages the cultivation of cotton which requires dry sunny days.

Low Intensity Punjab

D. G. Khan, Rajanpur, Muzaffargarh, Leiah, Mianwali, and Bhakkar are non-irrigated with rugged terrain. Hardier crops such as pulses or maize are grown here together with wheat.

Barani Punjab

Attock, Jhelum, Rawalpindi, Islamabad, and Chakwal form part of the Salt Range and Potowar Plateau and are considered separately due to the reliance on rainfall for agriculture. The rugged uneven terrain makes this region inhospitable for cultivation or irrigation; barani (rain-fed) subsistence farming is generally practiced here. This zone has the lowest poverty rates in the country due to diverse developmental schemes and a tradition for immigration.

Cotton/Wheat Sindh

The agriculturally rich districts, irrigated by the mighty Indus, of Sukkur, Khairpur, Nawabshah, Hyderabad, Tharparker, Nusheroferoz, Ghotki, Umerkot, Mirpurkhas, and Sanghar are used for the cultivation of cotton with wheat combination.

Rice Other Sindh

Jacobabad, Larkana, Dadu, Thatta, Badin, Shikarpur, and Karachi form this region. Irri rice is almost exclusively grown in this region with sugarcane where irrigation allows.

Khyber Pukhtunkhwa

The mountainous areas of Khyber Pukhtunkhwa with harsh winters discourage agriculture. The alluvial plains of Charsada, Swabi, Peshawar and Mardan are better suited with wheat, maize and sugarcane being the principal commercial crops. The district of D.I. Khan is included in this zone contrary to the Pickney classification in the interests of uniformity and ease of reference.

Balochistan

Subsistence agriculture is supported by traditional methods of irrigation such as Karaz system (comprising of underground canals). The terrain is uneven comprising of plateaus and mountain ranges.

Table 1

	Head Count	Poverty Gap	Poverty Severity
Rice/Wheat Punjab	.10	.01	.00
Mixed Punjab	.17	.02	.01
Cotton/Wheat Punjab	.33	.05	.01
Low Intensity Punjab	.39	.07	.02
Barani Punjab	.03	.00	.00
Cotton/Wheat Sindh	.27	.03	.01
Rice Other Sindh	.29	.04	.01
Khyber Pukhtunkhwa	.16	.02	.00
Balochistan	.42	.06	.02
Total	.23	.03	.01

The results (Table 1) indicated that Baluchistan displayed the highest incidence of poverty as measured by all three indices with 42 percent of the population living under the poverty line a poverty gap of 0.06 and a severity of 0.02. Within Punjab, the highest incidence of poverty was seen in low intensity Punjab with 39 percent of the population below the poverty line and the lowest in Barani Punjab with only 3 percent. In between these two extremes lay the other three subdivisions with cotton/wheat Punjab with 33 percent and mixed Punjab at 17 percent displaying higher poverty as compared to rice/wheat regions at 10 percent of the population below the poverty line. In Sindh there was higher poverty at 29 percent in rice/other Sindh when compared to the 27 percent in cotton/wheat regions of Sindh. Khyber Pakhtunkhwa had the lowest incidence of poverty among the four provinces with only 16 percent of the population below the poverty line.

When values denoted by the other two indices indicating the depth and severity of poverty were studied, a similar trend to that of the head count is observed. In Punjab the poverty gap and the severity of poverty were greatest in the low intensity regions of Punjab with poverty gap of 0.07 and severity of 0.02 while the lowest values were recorded in Barani Punjab where the poverty gap and severity of poverty both gave a zero value. In Sindh it was seen that the poverty gap and severity were greatest in the rice/other regions at 0.04 and 0.01 respectively while in wheat/cotton regions the poverty gap was 0.03 and the severity was recorded 7at 0.01. In Khyber Pakhtunkhwa the poverty gap was only 0.02 while the severity had a zero value. Overall it was seen that 23 percent of the rural population was falling below the poverty line. The poverty gap was 0.03 and the severity was 0.01.

Comparison of the figures describing poverty for the time period under study (2007-08) is problematic since there has been, to date, no official government release of poverty estimates, However, the Center for Poverty Reduction (CPRSPD), substantiated by the United Nations Development Program (UNDP), reported that national poverty fell drastically from 22.3 percent in 2005-06 to 17.2 percent in

2007-08. The World Bank validates this estimate. Rural Poverty was seen to decline from 27 percent to 20.6 percent. If these values are to be believed the reasons explained for this decline have been the increase in real GDP and real per capita income that grew by 11 percent and 7.3 percent respectively. In addition, the unemployment rate declined from 6.2 percent in 2005-06 to 5.2 percent in 2007-08 also some other key indicators of human development improved during these periods.

Punjab has been divided into five agro climatic zones using the methodology following [3] that classified rural areas in the country into nine agro-climatic or crop zones. This division relies on the major crop cultivated in each zone. The Kharif crops (cotton and rice) are primarily considered for this division since wheat is the main Rabi crop grown in all areas of the country. These zones are the rice/wheat Punjab, mixed Punjab, cotton/wheat Punjab, barani Punjab, low-intensity Punjab, cotton/wheat Sindh, rice/other Sindh, Khyber Pakhtunkhwa excluding D.I. Khan, Baluchistan except Nasirabad. The results obtained for the agro climatic zones of Punjab are consistent with other similar studies carried out for the year under study as well as results obtained from previous studies.

Studies that have documented the incidence of poverty across the agro climatic zones have consistently observed that Barani Punjab has the lowest incidence of poverty among all other zones. Barani Punjab consists of the five northern districts of Punjab; Rawalpindi, Jhleum, Chakwal, Attock and Islamabad. Malik (1992) studied the trends in rural poverty over the years, stating that in the 1984-85 periods, the maximum poverty was in cotton/wheat Punjab, followed by Baluchistan but in 1987-88 the zone with the highest poverty was low intensity Punjab and the cotton/ wheat Punjab moved to second place which was followed by rice/other Sindh. A more recent estimate from Malik [4] stated that in 2001-02, the worst off areas were Sindh and Southern Punjab. Another study [5] reported that the highest incidence of poverty in 1993-94 and 1998-99 were in cotton/wheat Sindh and rice/wheat Punjab. More recently, Irfan [6], used data from the 2004-05 PSLM survey and the official poverty for the said years to conclude that the cotton/wheat zone of Punjab ranked highest in terms of poverty, following which were NWFP and the low intensity zone of Punjab.

Cheema [7] used the 2003/04 district-level representative Multiple Indicator Cluster Survey and surmised that poverty was centered in the districts of Southern Punjab. The districts of Jhelum, Sialkot, Jhelum, Rawalpindi, Chakwal, Gujrat, Lahore and Attock displayed especially low levels of poverty. It is to be noted that four of these districts fall in the Barani Zone. A significant recent survey that can be used to compare the variation within the agro climatic zones of Punjab is the survey carried out by PIDE in August 2007. The survey made use of data from 647 households of ten districts of Punjab collected for the Sustainable Livelihood in Barani Area Punjab (SLBAP) project. Some of the districts included were Chakwal, Narowal, Rawalpindi, Sialkot, Jhelum, Minawali, Layyah, Gujrat, Khoshab and Bhakkar. However, the division of districts into zones for their work was such that a total of three zones were used. Barani Punjab was stated to include Jhelum, Rawalpindi And Chakwal, the Low Intensity Zone

was made up of Bhakkar, Layya, Khusab and Mianwali and the rice/wheat zone included Gujrat, Sialkot and Narowal. An adjusted poverty line of Rs 1023 per month per adult equivalent for 2007 was employed.

The results indicated that the overall incidence of poverty among the ten districts was 19.2 percent (2007). This meant that an estimated twenty five percent of the sampled rural population were poor. Across the zones, it was found that the lowest poverty was in the Barani zone at 15.6 percent while at the other end, the greatest was seen in the rice/ wheat zone at 22.6 percent. An intermediate value of 18.9 percent was recorded in the low intensity zone. The survey noted that the lower incidence of poverty obtained in the low intensity areas may be due to the omission of especially poor areas such as Muzzafargarh and Rajanpur from the survey.

Some of the factors that may affect the incidence of poverty within the agro climatic zones are landholdings, possession of livestock, the educational level of the head of household and the family size. Households with greater landholdings indicate a lower incidence of poverty, in addition the importance of owning livestock can be judged from one of the conclusions of the PIDE/SLBAP survey; those households that possessed five or more animals had a poverty headcount that was 19.5 percent lower than those that did not possess any. Poverty levels were also found to be lower in The results obtained are better explained when correlated with the results obtained by Pakistan Human Development Report compiled by the United Nations Development Program in 2003 [9]. The Human Development Index was used to rank province according to their level of social development. This index uses indices like enrolment ratios, literacy, infant mortality and real GDP per capita to quantify social development so that comparisons can be easily made. It was seen that within the rural areas of each province, the highest level of human development was seen in Punjab, followed by Khyber Pakhtunkhwa, rural Baluchistan came next while rural Sindh had the lowest levels of human development.

The World Food Program (WFP) [10] in 2003 carried out extensive research on food security in rural areas of Pakistan. The study estimated caloric poverty in rural Pakistan and found that food security was the lowest in Baluchistan with Dera Bugti being the most food insecure amongst all districts of Pakistan. Seven out of the seventeen districts analyzed in Sindh had caloric poverty greater than forty percent. Punjab was noted to be relatively more food secure with only five of its thirty four districts being significantly caloric poor. Khyber Pakhtunkhwa was faring well in terms of caloric poverty with none of its districts having a value of caloric poverty over forty percent.

In terms of the incidence of poverty, perhaps why Khyber Pukhtunkhwa seems to be doing much better than other areas of the country is because of the composition of its economy which runs chiefly on remittances and thus is not as likely to be adversely affected by the ups and downs of agriculture on which the economies of the other provinces are heavily dependent. The high incidence of poverty recorded in Baluchistan could be attributed to the unavailability of water

households headed by literate members than those headed by illiterate heads. The household size was directly related to poverty, the greater the household size, the greater was the incidence of poverty as larger households have higher dependency ratio (the ratio of dependents to workers).

Another research [8] investigated the effect of Labor Market structure on the variations in poverty in rural Punjab and concluded that the poverty differences across the different zones of Punjab could be interpreted in relation to three factors: overseas migration, urbanization and the labor market structure in use within the zones. They found that two of the zones (Barani and rice/wheat) had rural areas that were well incorporated with the urban set up and this had permitted the inhabitants of the rural areas of these zones to obtain profitable employment in such areas as the services sector of northern Punjab and the industrial sector of central Punjab. In addition, the belt from Lahore to Attock has profited maximally from remittances and overseas migration in bringing down poverty. Cotton/wheat and low intensity zones were poorer since these are areas that were heavily reliant on the farm sector for employment contrary to what was the case for the barani zone. Further explaining the higher poverty levels in the cotton/wheat and low intensity zones is the observation that demographic and social factors such as education are relatively un-favorable in these areas. for irrigation and the low levels of rainfall that make households more prone to natural calamities like droughts that endanger the two main sources of Baloch income; crops and livestock. In addition, other factors like lack of infrastructure, lower literacy rates and social capital may also be contributing factors.

The significantly high poverty measured in Sindh was explained as having arisen from a highly unequal distribution of land that gave rise to tenancy arrangements like sharecropping. Two areas in particular; the cotton/wheat zone and most of southern Punjab have traditionally depicted a high incidence of poverty. These areas account for a share in poverty that is much larger than their share in total population while the opposite is true for the Barani zone of Punjab.

CONCLUSION

Measurement of the incidence and severity of poverty across the agro climatic zones reveals that Baluchistan has the highest levels of poverty with 42 percent of the population below the poverty line. The Low Intensity Zone had the second highest poverty level with 39 percent of the population below the poverty line. The Barani Zone of Punjab, along with its districts of Rawalpindi, Jhleum, Chakwal, Attock and Islamabad had the lowest level of poverty. The poverty gap and severity of poverty followed the trend of head count values. The overall poverty level across all the zones was recorded at 23 percent below the poverty line. Khyber Pakhtunkhwa showed relatively lower levels of poverty while the other zones of Punjab had intermediate levels. The results suggest that the areas showing high levels of poverty need to be focused upon with attempts at poverty alleviation being directed towards them.

1. Rice/Wheat Punjab
2. Mixed Punjab
3. Cotton/Wheat Punjab
4. Low-intensity Punjab
5. Barani Punjab
6. Cotton/Wheat Sindh
7. Rice/Other Sindh
8. Other NWFP
9. Other Balochistan

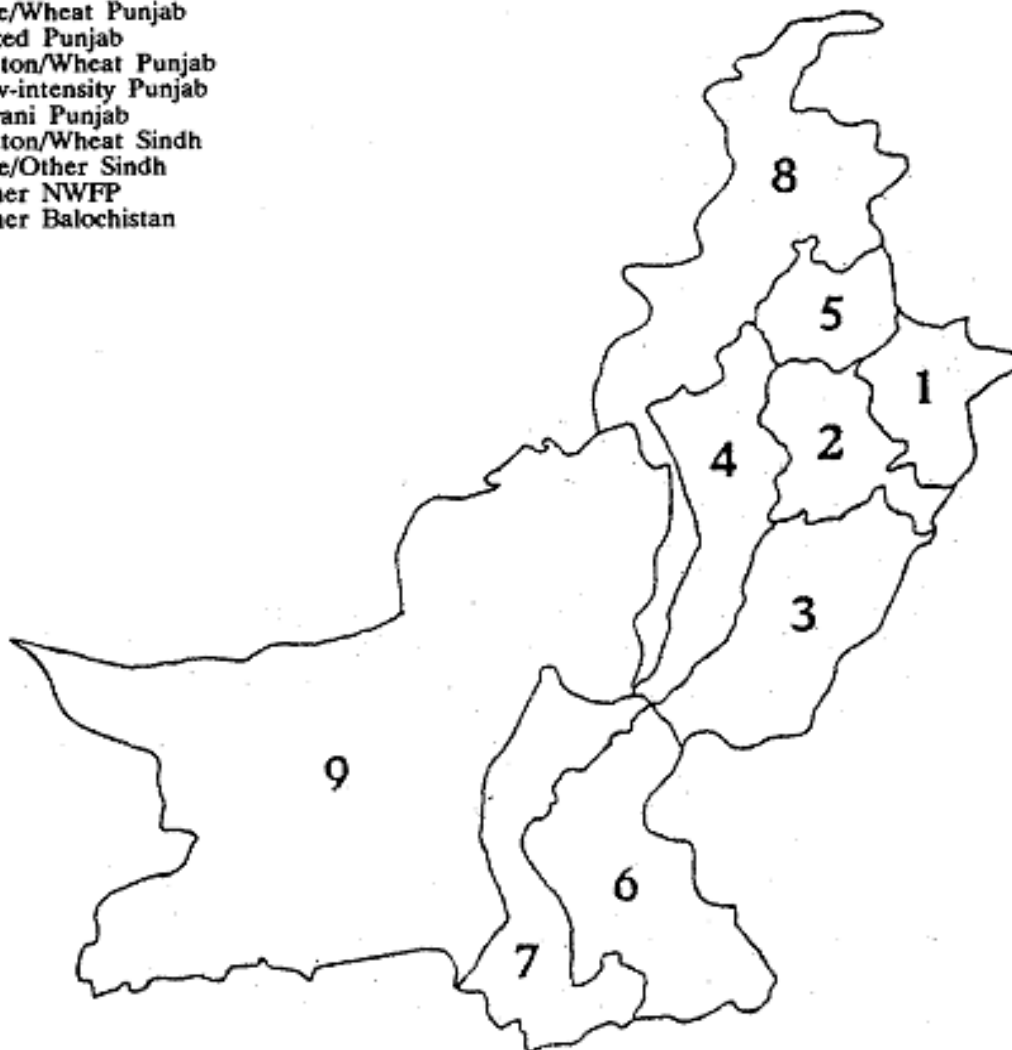


Fig. 1

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