POVERTY AMONG FARMING COMMUNITY IN MARGINAL AREAS OF PUNJAB

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Abstract

Land resources having low productive potential than those in normal areas are treated as marginal areas. These marginal areas are mainly due to lack of irrigation facilities, uneven topography and bad soil structure. Due to low agricultural productivity, farmers are poor in the marginal areas. There are 1.8 million hectares of Potohar Plateau, 4.48 million hectares of Desert areas (Thal and Cholishtan), 3.31 million hectares of Hilly areas (Muree, Salt range, Siwalik range, D.G. Khan) and 1.23 million hectares of Riverine areas classified as marginal areas in Punjab (ABAD 1988). Agriculture is totally dependent on rainfall in these areas. The present study was carried out in Potohar Plateau to assess poverty situation among farming community. Two villages were selected from each of the tehsils (Jand, Gujar Khan and Attock) based on their location, one near the road and other at least 10 kilometers away from the main road. Ten farmers and five non-farmers from each village were chosen for this study. A relatively lower poverty incidence was measured for Jand tehsil in Attock district as compared to Gujar Khan tehsil of Rawalpindi district. Family size, dependency ratio, education of the household head, landholding and noncrop income were found as the major determinants of the poverty in marginal areas of Punjab, Pakistan.

Introduction

Poverty is one of the main issues that could be considered an important impediment in the way of development of the country. Poverty affects the economic growth in two ways, when we have to spare resources to fight poverty and when low productivity of the poor slashes GDP of the country. In Pakistan, the extent of poverty is about 28 percent with recognition of higher incidence in rural areas (32 percent) than in urban areas (19 percent). In Pakistan, about 70 percent of the population reside in rural area and depends on agriculture sector, directly or indirectly, for their livelihoods. That is why the farming community is a major victim of poverty in Pakistan.

The lands having productive potential less than that of normal irrigated lands due to low and erratic precipitation, severe temperature, rough topography, poor soil structure and drainage can be termed as marginal lands. Such lands include rain fed, reverine, coastal, desert and hilly areas. According to a report of the National Commission on Agriculture, an increase in crop yields mainly from vertical expansion overriding the limitation on the area expansion imposed by the limited irrigation water supplies was recommended (Government of Pakistan 1988). However, targeted investment in marginal areas could offer greater scope of horizontal expansion in agriculture of the country. The detail of marginal areas of Pakistan is given in Table 1.

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Table 1: Distribution of marginal areas in the country (million hectares).

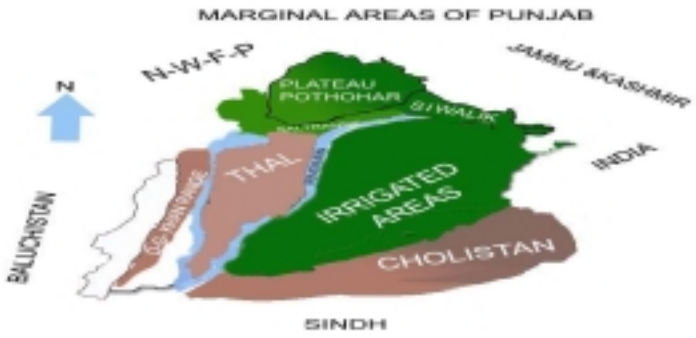
Areas	Punjab	Sindh	NWFP	Baluchistan	Pakistan
Rain Fed	1.8*	-	1.06	-	2.86
Hilly Areas	3.31*	-	1.40	17.71	22.42
Reverine	1.23*	1.54**	-	0.80	2.57
Desert	4.48*	2.80**	-	2.20***	9.48
Coastal	-	1.36	-	0.77	2.13
Total	10.82	5.7	2.46	21.48	40.46

Source: Government of Pakistan 1997, *ABAD 1988, ** Pakistan Desertification Monitoring Unit 1983 and ***Khan 2001

The important categories of marginal areas in Punjab are Potohar Plateau, Reverine Areas, Deserts (Thal & Cholistan) and Hilly areas (DG Khan, Muree, Salt Range and Siwalik Zone). *Potohar Plateau* is the north central area, comprising the major part of the marginal areas (1.8 million hectares) ranging from 1500 to 2000 feet in elevation. Half of this area is under cultivation with poor yield due to dry land farming. *Reverine Areas* (1.23 million hectares) located along main rivers are upper reaches of active flood plains of Ravi, Chenab, Jehlum and Indus from Kalabagh to Mithan Kot. This area has high potential of groundwater and the installation of shallow tubewells can serve the agricultural crops. *Thal Desert* (1 million hectares) is an integral part of the Indus plains with sandy and silty soils. The groundwater can be captured with deep well turbine pumps for growing crops in the region. *Cholistan Desert* (3.48 million hectares) is located in the districts of Bahawalpur and Bahawalnagar and the rainwater is stored in ponds for livestock and human being. This area can support the growth of forage trees like Acacia, Zizyphus and many shrubs for grazing of the animals. D.G. Khan and Rajanpur districts (1.67 million hectares) have the loamy soils with low rainfall, i.e. up to 250 millimeter annually. *Muree Hills* (0.09 million hectares) are located in the north east of the province, ranging from 2000 to 7000 feet in elevation. These are also called wet mountains, receiving rainfall in more than 1000 millimeters. The important land uses are for forestry and grazing along with the production of maize, wheat and fruit trees. *Salt Range* (0.90 million hectares) is ranging from 2000 to 3500 feet in elevation with inter mountain valleys covered by lose soils. Foothill plains are served with hill torrents. *Siwalik Zone* (0.65 million hectares) covers north eastern part of the Gujrat and Sialkot districts comprising plains deposited by hill torrents originating in the adjoining areas of Jammu and Kashmir hill ranges. Groundwater table is high in the region and the entire area can be used for cultivation of crops.

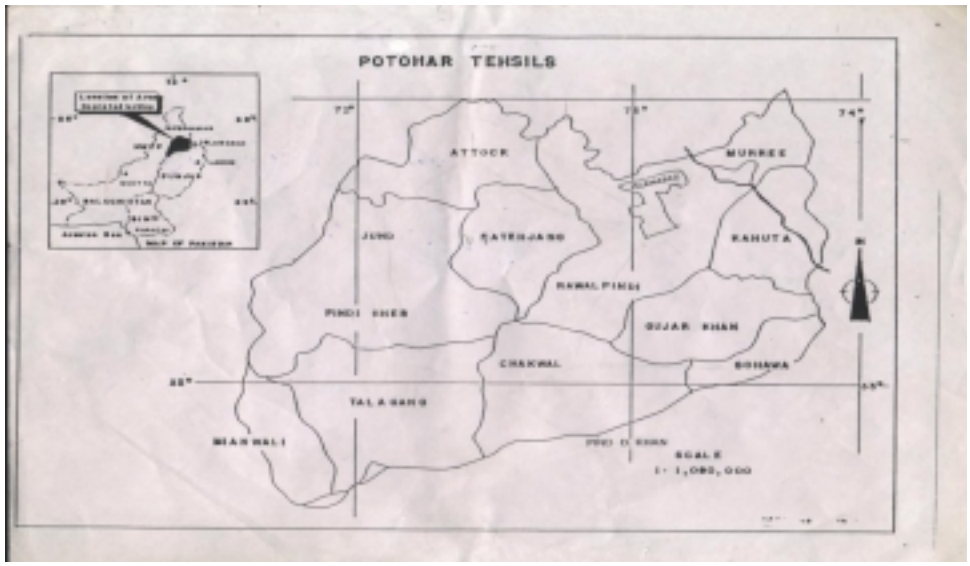
As the marginal areas are less productive than normal lands, poverty prevails among rural communities because they are mostly dependent on agriculture for their livelihood. The present study was planned to assess the poverty situation among farming community of the marginal areas along with some important determinants of poverty to extend some suggestions for the policy makers to cope the situation.

The current paper is divided into five parts. Methodology is described in part II. General results are discussed in part III of the paper while part IV, carries assessment of the determinants of poverty. Part V contains the conclusions made on the basis of current study.



Research Methodology

The Potohar Plateau (1.8 million hectares) was selected as study area, which forms the large contiguous block of rain fed agriculture in Pakistan. The study was carried out to assess poverty situation among farming community of Jand, Gujar Khan and Attock tehsils of the area. Two villages were selected from each tehsil based on their location, one near the road and the other 10 kilometers away from the main road to capture both the scenarios. Jand and Attock tehsil, are situated in the northeast while Gujar Khan tehsil is located at the south east of Potohar Plateau. Ten farmers and five non-farmers from each village were included in the survey for this purpose. Data was collected on a well-designed and pre-tested questionnaire.



Monetary Measures of Poverty

Foster-Greer-Thorbecke (FGT) class of measures is the most commonly used measure of poverty, which captures three aspects of poverty: incidence, depth/intensity, and severity of poverty. These measures are the Head Count Index, Poverty Gap Index and the Squared Poverty Gap Index.

Poverty Line Used for Current Study

For the analysis of poverty situation in the present study, official poverty line of Rs.673.54 per capita per month for 1999 on basic need basis was used. This was inflated to the prices of 2003, which resulted in inflated poverty line of Rs.742.38 per person. For sensitivity analysis, two other poverty lines, i.e. Rs. 642 and Rs. 542 per person per month, were used.

Results and Discussions

Poverty Line I (Rs. 742 / month)

Monetary measures of poverty were estimated for each of the three tehsils. Table 1 indicates poverty indices for each tehsil based on household income and expenditure at poverty line I (PL-I). The Head Count Index on annual expenditure basis shows that about 73.30, 80.00 and 47.80 percent of the sample households were living below the poverty line in the Attock, Gujar Khan and Jand tehsils, respectively. The highest proportion of poor households belonged to the Gujar Khan tehsil.

On an overall basis, the incidence of poverty in the areas was 67.60 percent whereas on the basis of income, the percentage of poor was 93.30 percent in Attock, 76.70 percent in Gujar Khan and 65.20 percent in Jand tehsil. The overall percentage was found to be 76.50 percent.

Table 1 also shows the figures for the poverty gap according to PL-I. The overall poverty gap was estimated to be around 39 percent, indicating that poor households needed an additional 39 percent of the present expenditure, to attain minimum basket of basic needs. Poverty gap squared annual expenditure was calculated as 20 percent, poverty gap annual income 50 percent and poverty gap squared annual income was 33 percent.

Table 1: Estimates of annual poverty based on Poverty Line I (Rs. 742 per capita / month).

		Tehsil			
Indicators	Category	Attock	D.G. Khan	Jand	Total
Poor-on expenditures basis	Non-Poor	26.70	20.00	52.20	32.40
	Poor	73.30	80.00	47.80	67.60
Poor-on income basis	Non-Poor	6.70	23.30	34.8	23.50
	Poor	93.30	76.70	65.20	76.50
Poverty Gap - Expenditures		0.29	0.41	0.45	0.39
Poverty Gap Squared – Expenditures		0.12	0.22	0.23	0.20
Poverty Gap – Income		0.53	0.54	0.40	0.50
Poverty Gap Squared – Income		0.38	0.38	0.21	0.33

Poverty Line II (Rs. 642 / month)

Table 2 depicts poverty situation on the basis of poverty line II i.e. Rs 642 per person per month. On the basis of annual expenditure, the poverty incidences were about 60.00, 73.30 and 43.50 percent of the sample households, indicating the percent of people who were living below the poverty line in the Attock, Gujar Khan and Jand tehsils,

respectively. The highest proportion of poor households belonged to the Gujar Khan tehsil. On overall basis, the incidence of poverty in the areas was 60.30 percent. Continuously on the basis of annual income, the percentage of poor were 80.00 percent in Attock, 73.30 percent in Gujar Khan and 56.50 percent in Jand tehsil whereas the overall percentage was found to be 69.10 percent.

Table 2 also represents the figures for the poverty gap according to PL-II. The overall poverty gap, based on annual expenditure, was estimated to be around 34 percent, indicating that poor households needed an additional 34 percent of the present expenditure to attain minimum basket of basic needs. Poverty gap squared annual expenditure was calculated as 16 percent, poverty gap based on annual income was calculated as 47 percent and poverty gap squared based on annual income as 31 percent.

Table 2: Estimates of Annual Poverty based on Poverty Line II (Rs. 642 per capita/month).

		Gujar Khan Tehsil			
Indicators	Category	Attock	G. Khan	Jand	Total
Poor - on Expenditure basis	Non-Poor	40.00	26.70	56.50	39.70
	Poor	60.00	73.30	43.50	60.30
Poor - on income basis	Non-Poor	20.00	26.70	43.50	30.90
	Poor	80.00	73.30	56.50	69.10
Poverty Gap – Expenditure		0.24	0.36	0.41	0.35
Poverty Gap Squared – Expenditure		0.1	0.18	0.19	0.16
Poverty Gap - Income		0.56	0.49	0.35	0.47
Poverty Gap Squared – Income		0.39	0.35	0.18	0.31

Poverty Line III (Rs. 542 / month) and Poverty Gap

Poverty situation on the basis of poverty line III is given in Table 3. On the basis of annual expenditure, the poverty indices were about 33.30, 53.30 and 39.10 percent of the sample households, indicating the percentage of people who were living below the poverty line in the Attock, Gujar Khan and Jand tehsils, respectively. The highest proportion of poor household belonged to the Gujar Khan tehsil. On an overall basis, the incidence of poverty in the areas was 44.10 percent whereas on the basis of annual income, the percentage of poor was 80.00 percent in Attock, 56.70 percent in Gujar Khan and 43.50 percent in Jand tehsil. The overall percentage was found to be 57.40 percent.

Table 3 also presents figures for the poverty gap according to PL-III. The overall poverty gap based on annual expenditure was estimated to be around 34 percent, indicating that poor households needed an additional 34 percent of the present expenditure to attain minimum basket of basic needs. Poverty gap squared based on annual expenditure was calculated as 7 percent, poverty gap based on annual income 47 percent and poverty gap squared based on annual income 32 percent.

From the sensitivity analysis by comparing the results of PL-I and PL-III, it is evident that 44 percent are chronic poor and 23 percent are at the verge of poverty line waiting for any positive change in the business cycle to be converted in to the category of non poor. In Attock, 40 percent of the persons are at the verge of poverty line while this percentage is 27 for Gujar Khan. Also the comparison of poverty gap of PL-I and PL-III indicates overall decline of five percent while it is highest, 12 percent, for Jand and

lowest, 2 percent, for Attock. Highest decline in severity (18%) was observed in Jand while lowest (9%) was observed in Attock.

Table 3: Estimates of Annual Poverty based on Poverty Line III (Rs. 542 per capita / month).

Indicators	Category	Tehsil			Total
		Attock	G. Khan	Jand	
Poor - on expenditure basis	Non-Poor	66.70	46.70	60.90	55.90
	Poor	33.30	53.30	39.10	44.10
Poor - on income basis	Non-Poor	20.00	43.30	56.50	42.60
	Poor	80.00	56.70	43.50	57.40
Poverty Gap – Expenditure		0.27	0.36	0.33	0.34
Poverty Gap Squared – Expenditure		0.03	0.09	0.05	0.07
Poverty Gap – Income		0.48	0.54	0.35	0.47
Poverty Gap Squared – Income		0.34	0.4	0.17	0.32

These results were consistent with other studies. Ahmad (1998) reported 47 percent poverty in 1992-93 and 50 percent in 1995-96 in Punjab, by using basic needs poverty approach. Similarly, (Bhatti et al. 1999) also reported that 50 percent of rural population was living below poverty line.

Sources of Household Income

Highest annual income was observed in Gujar Khan tehsil for non-poor with the average annual income of Rs. 65933 while lowest annual income was seen in case of poor where average annual income was Rs.39622. Crop income shares very minor portion in total annual income. Remittances contribute major portion in non-crop income followed by pension.

Determinants of Poverty

In order to determine the effects of different factors on poverty, Logit regression was employed. Logit regression technique is employed when dependent variable has value of 1 or 0. The coefficients of independent variables tell about the probability of being or not being of one of the two possibilities of dependent variable. The model specifications are as follows:

$$\text{Poverty} = \beta_0 + \beta_1 * FS + \beta_2 * DR + \beta_3 * HHE + \beta_4 * NLH + \beta_5 * NCI + e$$

Dependent variable is equal to Poverty (if poor then 1, otherwise 0) and the independent variables are FS (Family size in number), DR (Dependency ratio), HHE (Education of the household head), NLH (Net landholding in hectares), NCI (Non crop income in thousand rupees). Here, □0 is the constant term and □1…□5 are the coefficients while e stands for error term.

From the estimated coefficients of the model, marginal effect of each independent variable was calculated. The marginal probability is defined by the partial derivative of the probability, which dependent variable assumes a value of 1 with respect to that independent variable. The marginal probability is defined by:

$\partial P/ \partial B = f(BX)\, B$

Where B is the slope of the coefficient. X is the independent variable while f is the density function of the cumulative probability distribution function f (BX), which ranges from 0 to 1. The marginal effect could be interpreted as the change in the probability of household being poor with a one-unit increase in the explanatory variable. The marginal probability values were estimated as the mean values of the explanatory variables.

Family Size

Higher the family size, higher the probability of the household was found to be poor. With increase of one member in the family size, the marginal probability of being poor for that family was estimated as 0.046.

Dependency Ratio

Dependency ratio was the ratio of number of household members below 16 years and above 60 years divided by family size. With increase in number of dependents in the household, probability of being poor became higher and was estimated to be 0.048.

Education of the Household Head

The education of the head of the family also plays important role in being poor or not. Families with educated head were less poor than households with no education. With the attainment of education, marginal probability of being poor decreased and was estimated as -0.097.

Net Landholding

It was indicated that increase in net landholding would decrease the probability of the household to become poor and the marginal probability was estimated as -0.011. Negative sign for the coefficient of net landholding was indicating inverse relationship with poverty.

Non Crop Income

Income from resources other than agriculture is very supportive for rural community. It has negative correlation with poverty. People having such income resources were found less poor than those without non-crop income and the marginal probability was -0.004.

The regression results are shown in Table 4. Here, the number of observations is 68 and Log likelihood function is -35.57420. Similarly, restricted Log likelihood and Chi-squared is 42.80609 and 14.46376, respectively. Degree of freedom is 5 and significance level is 99 percent.

Table 4: Regression Results.

Variables	Coefficients	S- Error	T-ratio	P-value	Marginal Probabilities
FS	0.228	0.115	1.972	0.049	0.046
DR	0.239	0.755	0.317	0.752	0.048
HHE	-0.482	0.235	-2.051	0.040	-0.097
NLH	-0.056	0.092	-0.607	0.544	-0.011
NCI	-0.021	0.009	-2.315	0.021	-0.004
	0.824	0.880	0.937	0.349	0.166

Conclusions

Incidence of poverty was highest in Gujar Khan tehsil while it was lowest in Jand tehsil. Higher proportion of the households in Attock tehsil was lying on the verge of poverty line showing high sensitivity to variation in poverty line. Depth of poverty (poverty gap) was found highest in Jand and Gujar Khan tehsils. Severity of poverty was highest for the households in Jand. Higher proportion of annual income was captured by non-crop income for the households in all the three tehsils. Annual income per household was highest in Gujar Khan tehsil while it was lowest for households in Attock tehsil. An increase in family size was found to increase the probability of household to be poor. More investment in population planning would be effective. Increasing size of landholding would reduce the probability of being poor for any particular house. This requires land reforms as well as legislation to stop further de fragmentation of land into uneconomical unit size. More education of the household head would reduce the probability of household to become poor. More investment on education, especially on improving and strengthening the already prevailing setup, would impart its benefits quickly and efficiently.

Literature Cited

Agency for Barani Area Development (ABAD). 1988. *Master plan for barani area development*. Rawalpindi, Pakistan: Planning and Development Department, Government of Punjab.

Ahmad, M. 1993. Choice of a norm of poverty threshold and extent of poverty in Pakistan. *The Journal of Development Studies*, XII-XII.

Government of Pakistan. 1988. *Report of national commission on agriculture*. Islamabad, Pakistan: Ministry of Food, Agriculture and Livestock, Government of Pakistan.

Government of Pakistan. 1993. *Report of committee on agriculture and water: 8th Five Year Plan 1993-98*. Islamabad, Pakistan: Planning Commission, Government of Pakistan.

Government of Pakistan. 1997. *Report of sub working group on development of marginal areas: Ninth five-year plan*. Islamabad, Pakistan: Planning Commission, Government of Pakistan.

Government of Pakistan. 2002. *Economic survey 2001-2002*. Islamabad, Pakistan: Ministry of Finance and Economic Affairs, Finance Division, Government of Pakistan.

Government of Pakistan. 2002. *Agricultural statistics of Pakistan 2000-01*. Islamabad, Pakistan: Ministry of Food, Agriculture and Livestock, Government of Pakistan.

Government of Pakistan. 2002. *Official poverty line.* Notification No. 1(41) Poverty/PC/2002, Issued by Planning and Development Division, Government of Pakistan. Islamabad, Pakistan.

Khan, S.R.A. 2001. *Crop management in Pakistan*. Lahore, Pakistan: Agriculture Department, Government of Punjab.

Pakistan Desertification Monitoring Unit. 1983. *Pakistan desertification problem, extent and remedial measures*. Country Report. Lahore, Pakistan: Irrigation Drainage and Flood Control Research Council.