

INCIDENCE OF POVERTY AND THE ROLE OF NON-FARM ACTIVITIES

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ABSTRACT:- The incidence of poverty, poverty gap and the severity of poverty for the nine agro-climatic zones of the country (rice/wheat Punjab, mixed Punjab, cotton/wheat Punjab, low intensity Punjab, Barani Punjab, cotton/wheat Sindh, rice other Sindh, Khyber Pakhtunkhwa and Balochistan) were calculated for farming and non-farming households. The indices of poverty were also measured for households that only did farming, undertook farming and non-farm activities and those that did no farming in the various agro-climatic zones. Finally, incidence and severity of poverty as well as the spread of income among the poor for non-farm wage earners, farm wage earners, non-farm self-employed and the crop cultivators in the nine agro-climatic zones of rural Pakistan was also carried out. The relationship between incidence of poverty and non-farm activities is ambivalent with non-farm households being better off in regions that are less fertile. The incidence of poverty was highest amongst farm wage workers, followed by non-farm wage workers, non-farm self-employed and lastly crop cultivators.

Key Words: Poverty; Poverty Gap; Agroclimatic Zones; Households; Farming; Community; Pakistan.

INTRODUCTION

Poverty is a challenge faced by Pakistan today and demands immediate attention and action. Since a majority of the poor reside in rural areas, therefore, any poverty alleviation programme must consider the rural economic landscape. Moreover, agriculture can no longer serve as the way out of poverty. The gap between jobs in agriculture and rural workforce is ever widening. Rural to urban migration has already placed undue pressure on urban civic amenities and has led to slums and squatter settlements (Islam, 1997). The non-farm sector therefore, assumes critical importance in alleviating rural poverty. In this study, an attempt was made to gauge the effect that non-

farm activities can have on the welfare of rural households. For this purpose, micro data from the Household Integrated Economic Survey was analyzed (GoP, 2007-08).

A review of the previous research is unequivocal about the importance of the non-farm sector for rural uplift. However, conflicting results have been obtained from various studies regarding the relationship between rural non-farm sectors on poverty alleviation. This may be due to differences in the distribution of land. In countries like Pakistan and most of Latin America that experience a scarcity of land and have a large labour force, the poor are motivated to enter the rural non-farm (RNF) sector by a distress push, hence a large number of households may be

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forced to leave agriculture and join the RNF sector. In land rich, labour scarce countries of most of Africa, only the rich are pulled into non-farm employment. Hence in the latter the sector is dominated by the relatively better off (Reardon et al., 1998).

Arif et al. (2000) found that although poverty levels have increased in rural areas, non-farm workers no longer belong to the poorest category as non-farm wage workers are better off than agricultural labourers. Services and trade sectors were important in reducing rural poverty and the poor were noted to concentrate in the construction, transport and manufacturing sector.

Farmers with less than 0.5 ha, earn 30-90% of their income from non-farm activities (Hazell and Haggblade, 1993). The objectives of present study are to analyze the incidence of poverty among farming and non-farming households; analyze the incidence of poverty across nine agro-climatic regions of Pakistan and make policy recommendations.

MATERIALS AND METHOD

Income accrued from agriculture following a sectoral approach, income from crop cultivation, livestock, forestry, and fisheries (through self-employment or wage employment) are defined as farm income. Income earned from self-employment or wage employment in manufacturing sector or in services sector in rural areas is defined as non-farm income. Households have been classified into farm or non-farm households by the sources of their income. The more common approach followed in literature is to classify households by the industry of the head of house-

holds. Whilst this approach may merit some use in an urban setup with nuclear families it is distinctly ill-adapted for rural Pakistan that is dominated by large joint families with the head of household often being an elderly patriarch. Also, the classification by industry rather than by occupation was preferred given the nature of the study.

The data used in this study is from Household Integrated Economic Survey (HIES) conducted by Federal Bureau of Statistics in 2007-08. It is a nationally representative survey used for the compilation of PSLM-HIES (Pakistan Social and Living Standards Measurement-Household Integrated Economic Survey).

The poverty measures used are the headcount ratio, average poverty gap and the squared poverty gap (Foster et al., 1984).

Head Count

Most common and preferred measure is the headcount ratio (incidence of poverty) which uses poverty line (caloric intake method) as the yardstick. While this measure is easy to compute and its use is widespread, it fails to give an idea of the depth of the poverty i.e., how far away a household is from the poverty line (z).

$$P_{oi} = P_o(c_i) = \begin{cases} 1 & \text{if } c_i < z \\ 0 & \text{if } c_i \geq z \end{cases}$$

where,

P_{oi} = The i^{th} household equal to 1 if household is poor and zero otherwise

c_i = Per adult equivalent consumption expenditure of the individual i .

$$\text{Headcount (HC)} = \frac{1}{N} \sum_{i=1}^N P_o(c_i)$$

where,

i and N = Total population

Poverty Gap

The average poverty gap gives an idea of the spread of income amongst the poor. It is the product of incidence of poverty and the difference between the incomes of the poor and the poverty line:

$$P_{1i} = P_1(w_i) = \begin{cases} \frac{z - w_i}{z} & \text{if } w_i < z \\ 0 & \text{if } w_i \geq z \end{cases}$$

where,

P_{1i} = The i^{th} household equal to poverty gap

z = Poverty line

w_i = Per adult equivalent consumption expenditure of the individual i .

$$\text{Poverty Gap (PG)} = \frac{1}{N} \sum_{i=1}^N P_1(w_i)$$

To summarize, the Poverty Gap Index is the average over the total population of the difference between the standard of living of the poor and the poverty line expressed as a ratio of the poverty line. The aggregate of poverty gap shows the cost of eliminating poverty by making perfectly targeted transfers to the poor.

Poverty Severity

The last measure that was used is the square of poverty gap; it gives the severity of poverty. It is the weight sum of poverty gaps where the weights are proportional to poverty gaps themselves and a proportion of the poverty line:

$$P_{2i} = P_2(w_i) = \begin{cases} \frac{(z - w_i)^2}{z} & \text{if } w_i < z \\ 0 & \text{if } w_i \geq z \end{cases}$$

where,

P_{2i} = The i^{th} household equal to poverty severity

z = Poverty line

w_i = Per adult equivalent consumption expenditure of the individual i .

$$\text{Poverty Severity (SP)} = \frac{1}{N} \sum_{i=1}^N P_2(w_i)$$

Moving from the headcount ratio to the poverty gap to poverty severity, more weight is given to the households that are furthest away from the poverty line and hence the poorest. A weight equal to the household size times the population weight for the Primary Sampling Unit (PSU) is given when the individual values are summed up.

RESULTS AND DISCUSSION

Results revealed that overall 26% households that acquired a major share of their income from farm sources were poor compared to 23% of those who relied more on non-farm sources (Table 1). Farm and non-farm households exhibited almost the same incidence of poverty in Punjab, Balochistan and Khyber Pakhtunkhwa but in Sindh, non-farm households displayed a lower incidence of poverty at 26% compared to 33% for farm households. Thus it was seen that at least in Sindh, households employed in the non-farm sector were better off.

In Punjab, the households mainly employed in farming were better off in the mixed, cotton/wheat and *barani* areas but there was no significant difference between main farm and main non-farm households in the low intensity and rice/wheat zones

Table 1. Incidence percent of poverty among main farm and main non-farm households by province during 2007-08

Province	Incidence	Main farm	Main non-farm
Punjab	Head count	23	22
	Poverty gap	4	4
	Poverty severity	1	1
Sindh	Head count	33	26
	Poverty gap	5	4
	Poverty severity	1	1
Khyber Pakhtunkhwa	Head count	17	17
	Poverty gap	3	2
	Poverty severity	1	1
Balochistan	Head count	38	39
	Poverty gap	7	7
	Poverty severity	2	2
Total	Head count	26	23
	Poverty gap	5	4
	Poverty severity	1	1

(Table 1). In Sindh, poverty was significantly lower among the main non-farm households of the cotton/wheat zone, 32% the main farm households were poor compared to only 22% of the main non-farm. In the rice/other regions of Sindh, poverty was lower among main non-farm households (30%) compared to main farm (34%).

Thus, employment in the agricultural sector is beneficial only in the highly fertile agro-climatic zones of mixed and cotton/wheat Punjab where households derive a greater part of their income from the farm sector. The farming households are better off but when the incidence of poverty in the entire zone is looked at, it is seen that the cotton wheat zone of Punjab has a incidence of poverty at 33%. Malik (2005) found that income from farming is 67% of the total income in cotton/wheat Sindh and 64% of the total income in cotton/wheat Punjab and these two zones show some of the highest

Table 2. Incidence percent of poverty among main farm and main non-farm and across households by agro climatic zones during 2007-08

Zone	Incidence	Main farm	Main Non-farm
Rice/Wheat Punjab	Head count	10	11
	Poverty gap	2	2
	Poverty severity	0	0
Mixed Punjab	Head count	11	21
	Poverty gap	2	3
	Poverty severity	1	1
Cotton/Wheat Punjab	Head count	33	37
	Poverty gap	6	7
	Poverty severity	2	2
Low Intensity Punjab	Head count	39	39
	Poverty gap	8	9
	Poverty severity	2	3
<i>Barani</i> Punjab	Head count	1	3
	Poverty gap	0	0
	Poverty severity	0	0
Cotton/Wheat Sindh	Head count	32	22
	Poverty gap	5	3
	Poverty severity	1	1
Rice Other Sindh	Head count	34	30
	Poverty gap	6	5
	Poverty severity	1	1
Khyber Pakhtunkhwa	Head count	17	17
	Poverty gap	3	2
	Poverty severity	1	1
Balochistan	Head count	38	39
	Poverty gap	7	7
	Poverty severity	2	2

incidences of poverty supporting the idea that the highest levels in poverty are seen across zones that are dependent on crop incomes.

Malik (1992) and Qureshi and Arif (1999) observed that rural poverty was lower in areas where households had the opportunity to supplement income from non-agricultural sources like in the *barani* zone. Rural areas of many of the districts that are a part of this zone (Chakwal, Rawalpindi, Islamabad, Attock) are intimately linked to their respective urban areas.

In Sindh, the incidence of poverty among farming households may be greater because of the significantly

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larger share on tenants in Sindh. The owned farms are generally larger in Sindh but those that employ tenants are smaller than those in other provinces.

The results obtained by Qureshi and Arif (1999) indicated that in 1993-94, the non-farm households showed a higher incidence of poverty compared to farm households. In seven of the nine zones, the farm households fared better. The differences were more significant in Khyber Pakhtunkhwa and Punjab.

The results describing the incidence of poverty within the pure farm,

no farm income and mixed farming households in the nine agro climatic zones revealed that poverty was lower across farm households in mixed Punjab, cotton wheat Punjab and *barani* Punjab (Table 3). In low intensity Punjab and cotton/wheat and rice/other Sindh, higher levels of poverty were seen in pure farming households. In Khyber Pakhtunkhwa, Balochistan and rice/wheat Punjab, it was noted that poverty levels were same for farm and non-farm households. In mixed farm households, the incidence of poverty compared to pure farm and non-farm

Table 3. Incidence percent of poverty across households by agro climatic zones during 2007-08

Zone	Incidence	No farm income	Pure farm households	Mixed farm households
Rice/Wheat Punjab	Head count	8	8	17
	Poverty gap	1	2	2
	Poverty severity	0	1	1
Mixed Punjab	Head count	18	12	2
	Poverty gap	3	2	3
	Poverty severity	1	1	1
Cotton/Wheat Punjab	Head count	34	31	39
	Poverty gap	6	6	7
	Poverty severity	2	2	2
Low Intensity Punjab	Head count	35	41	39
	Poverty gap	8	9	8
	Poverty severity	2	2	3
<i>Barani</i> Punjab	Head count	4	1	0
	Poverty gap	1	1	0
	Poverty severity	0	0	0
Cotton/Wheat Sindh	Head count	22	30	29
	Poverty gap	3	5	5
	Poverty severity	1	1	1
Rice other Sindh	Head count	27	33	37
	Poverty gap	4	6	6
	Poverty severity	1	1	1
Khyber Pakhtunkhwa	Head count	15	15	18
	Poverty gap	2	3	3
	Poverty severity	0	1	1
Balochistan	Head count	4	40	35
	Poverty gap	7	8	6
	Poverty severity	2	2	2

income households was higher in most zones (rice/wheat Punjab, mixed Punjab, cotton/wheat Punjab, rice/other Sindh and Khyber Pakhtunkhwa). In Balochistan and *barani* zone of Punjab, the poverty level was lower than that for both farm and non-farm households. In low intensity Punjab and cotton/wheat Sindh, the incidence of poverty in mixed farm households was same or slightly lower than in pure farm households but still higher than non-farm income households.

In rice/wheat Punjab, the incidence of poverty in non-farm income and pure farm income households was 8% whereas that for mixed farm households was much higher (17%). In mixed Punjab, 18% of non-farm households were below the poverty line compared to 12% of pure farm households whereas 20% of mixed farming households were below the poverty line. In cotton/wheat Punjab, the figures were 34% for non-farm income households, 31% for pure farm and 39% for mixed farm households. In low intensity Punjab, the no farm income households had an incidence of poverty of 35% below the poverty line the value was 41% for pure farmers and 39% for mixed households. In *barani* Punjab, 4% of non-farm households were below the poverty line compared to 1% of pure farmers and 0% of mixed farmers.

In cotton/wheat Sindh, 22% of the non-farm income households fell below the poverty line while the pure farmers and mixed farmers were at 30% and 29%, respectively. In rice/other zone of Sindh the indices were 27% for non-farm households, 33% for pure farming households and 37% for mixed farming households. In Khyber Pakhtunkhwa, poverty was at

15% for both farm and non-farm households while 18% for mixed farming households. In Balochistan, much higher levels were observed at 40% for both farm and non-farm households and 35% for mixed farmers.

The indices of poverty across four kinds of occupations were examined; in the non-farm category the non-farm wage earners and non-farm self-employed workers were examined and in the farm sector crop cultivators and agricultural wage workers were considered.

Among crop cultivators in the farm sector (Table 4), it was determined that 20% of the crop cultivators of rural Pakistan were poor. It was noted that the relatively high poverty was seen in Balochistan, cotton/wheat and rice/other Sindh and the low intensity zone of Punjab. The highest recorded headcount ratio among crop cultivators was in Balochistan at 40%, this was followed by rice/other

Table 4. Incidence percent of poverty among various occupations by agro-climatic zones during 2007-08

Zone	Head count	Poverty gap	Poverty severity
Rice/Wheat Punjab	8	1	0
Mixed Punjab	9	1	0
Cotton/Wheat Punjab	23	3	1
Low Intensity Punjab	35	6	2
Barani Punjab	0	0	0
Cotton/Wheat Sindh	32	3	1
Rice Other Sindh	38	5	1
Khyber Pakhtunkhwa	16	2	0
Balochistan	44	7	2
Total	20	3	1

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Sindh at 38%, low intensity Punjab was at 35% whereas in cotton/wheat Sindh 32% of crop cultivators fell below the poverty line. The lowest value was noted in *barani* Punjab which showed a headcount ratio of 0%, other areas depicting low levels of poverty were rice/wheat Punjab and mixed Punjab at 8% and 9%, respectively. Intermediate levels were seen in Khyber Pakhtunkhwa (16%) and cotton/wheat Punjab (23%).

Overall 38% of farm wage workers were under the poverty line (Table 5). The highest levels of poverty among farm wage workers was seen in low intensity Punjab at 52% following which were farm workers in cotton/wheat Punjab at 48%. In other zones of Punjab, the headcount ratio was at 30% for mixed Punjab and rice/wheat Punjab. *Barani* Punjab depicted the least poverty among farm wage workers in rural Pakistan at only 11% below the poverty line. In

Balochistan, the incidence of poverty among farm wage workers was 38%. In Sindh, higher poverty was seen in the cotton/wheat zone at 33% compared to 28% in rice/other Sindh. In Khyber Pakhtunkhwa, it was seen that poverty among farm wage workers was at 29% below the poverty line. Poverty rates generally follow the agro-climatic trend with the more fertile regions such as rice Punjab having lower rates than more arid regions such as Balochistan.

In the non-farm sector, the non-farm wage earners and the non-farm self-employed workers were considered. The overall headcount ratio among non-farm wage earners in rural-Pakistan was 24% (Table 6). The highest incidence of poverty was seen amongst non-farm wage workers in Balochistan with 44% of them below the poverty line. In Punjab it was noted that in the cotton/wheat and low intensity zones, the non-farm

Table 5. Incidence percent of poverty among farm wage earners by agro climatic zones during 2007-08

Zone	Head count	Poverty gap	Poverty severity
Rice/Wheat Punjab	30	5	1
Mixed Punjab	30	5	2
Cotton/Wheat Punjab	48	9	3
Low Intensity Punjab	52	10	3
<i>Barani</i> Punjab	11	0	0
Cotton/Wheat Sindh	33	4	1
Rice Other Sindh	28	3	1
Khyber Pakhtunkhwa	29	4	1
Balochistan	38	5	1
Total	38	6	2

Table 6. Incidence percent of poverty among non-farm wage earners by agro climatic zones during 2007-08

Zone	Head count	Poverty gap	Poverty severity
Rice/Wheat Punjab	12	2	0
Mixed Punjab	22	3	1
Cotton/Wheat Punjab	38	6	2
Low Intensity Punjab	37	6	2
<i>Barani</i> Punjab	4	0	0
Cotton/Wheat Sindh	27	3	1
Rice Other Sindh	30	4	1
Khyber Pakhtunkhwa	19	2	0
Balochistan	44	6	2
Total	24	3	1

wage earners were relatively poorer than in the rest of Punjab with headcount ratios of 38% and 37%, respectively. The lowest rates of poverty were amongst the non-farm wage earners in barani Punjab at only 4% below the poverty line. In the remaining two zones of Punjab, mixed Punjab and rice/wheat Punjab, higher poverty among the non-farm wage earners was observed in mixed Punjab at 22% compared to the 12% seen in rice/wheat Punjab zone. The non-farm wage earners in Sindh were also noted to have a high incidence of poverty at 27% in cotton/wheat Sindh and 30% in rice/other Sindh. In Khyber Pakhtunkhwa, 19% of the non-farm wage earners were poor. Amongst the non-farm self-employed workers the highest level of poverty obtained was in low intensity Punjab at 40 % below the poverty line.

Overall incidence of poverty among non-farm self-employed individuals

Table 7. Incidence percent of poverty among non-farm self employed by agro climatic zones during 2007-08

Zone	Head count	Poverty gap	Poverty severity
Rice/Wheat Punjab	10	1	0
Mixed Punjab	14	2	1
Cotton/Wheat Punjab	31	5	1
Low Intensity Punjab	40	7	2
Barani Punjab	2	0	0
Cotton/Wheat Sindh	21	3	1
Rice Other Sindh	32	4	1
Khyber Pakhtunkhwa	14	1	0
Balochistan	36	5	1
Total	21	3	1

was 21% (Table 7). The lowest poverty recorded (2%) was among the non-farm self-employed workers in the *barani* Punjab. The non-farm self-employed of cotton/wheat zone of Punjab were also poor with an incidence of poverty at 31%. In the rice/wheat and mixed Punjab zones however, the non-farm self-employed were better off with headcount ratios of 10% and 14%, respectively. The non-farm self-employed workers of rice/other Sindh were poorer at 32% than cotton/wheat zone that had 21% of its non-farm self-employed individuals below the poverty line. The non-farm self-employed workers from Khyber Pakhtunkhwa were better off at 14% and Balochistan once again had a higher incidence of poverty at 36%.

Thus among the four categories of employment the overall values of headcount ratios are 24% for non-farm wage earners, 21% for non-farm self-employed, 38% for farm wage earners and 20% for crop cultivators. The significant observation made from the above results is that the highest incidence of poverty amongst the four studied categories was found in the farm wage earners category at 38%.

A major portion of the rural poor are landless. Anwar et al. (2004) quoted that around 75% of rural households in the country owned no land and only 0.05% of them possessed > 2 ha of land in Punjab and Sindh following which were Khyber Pakhtunkhwa, Sindh and Balochistan, respectively.

Agricultural waged workers are men and women who work on farms, plantations, orchards, glasshouses, livestock units and in primary industries such as those involved in the processing and production of food and fiber. Their payment are in cash

and/or in-kind. The employment may be long term (permanent) or short term, may employ the local workforce or migrants and the mode of payment may be per unit of work done and may consist of small farmers who make use of such employment opportunities to supplement their farm income. They make up the poorest and the most food insecure group.

They are considered waged workers because they own no right to the farms they work on and the farming equipment they utilize and hence are a group distinctive from farmers. Waged agriculture work is very heterogeneous and the specifications of employment vary tremendously thus generating a variety of possible employment. The nature of employment is such that it is heavily dependent on seasonal fluctuations in agriculture. The wages are low and payment to temporary or seasonal workers is often in part on a piece of work basis. The working hours are long, exhausting and labor intensive. There are no job guarantees and the returns are low. It is mainly the unskilled and the landless segment of the rural population that is pushed into agricultural wage employment and such employment does little to alleviate poverty.

When rural poverty between the agricultural wage laborers and non-farm wage workers are compared, it is seen that poverty levels are significantly lower (24%) for non-farm wage workers. Non-farm wage workers are better safeguarded against poverty since their wages are typically higher and there is less seasonal variability. Non-farm wage work is low productivity work that mainly attracts the landless and functionally landless households that have been pushed

out of agriculture.

CONCLUSION AND RECOMMENDATIONS

The results from calculations involving poverty helped assess the distribution of the poor across the provinces and zones and thus allowed the identification of those areas that need more attention from policy makers. Mixed results were obtained indicating that agriculturally productive areas had lower poverty rates for farming households while in other regions non-farm households were better off.

The profitability of non-farm employment was also estimated by the comparison of poverty levels among the pure farm, mixed farm and no farm households and the main farm and main non-farm households. The poverty levels between the different types of employment (non-farm wage work, farm wage work, crop cultivation and non-farm self-employment) were also compared and hence helped deduce the kind of employment in which the households were better off. The incidence of poverty was found to be highest amongst farm wage workers, followed by non-farm wage workers, non-farm self-employed and lastly crop cultivators.

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