Poverty in Riverine Areas : Vulnerabilities, Social Gaps and Flood Damages

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Abstract

No doubt Indus Basin contributes substantially towards economic development of the country in the form of hydel power generation, irrigation purpose, drinking water for human beings as well as animals, conserving and sustaining nature/ ecosystem, however flooding in these rivers is the major threat to the habitats. The total area of the province is 51 million acres and the area in the active flood zone is about 7.7 million acres. Pakistan has a long history of repeated localized and widespread flooding that has caused loss of life, substantial damage to property and infrastructure and loss of agricultural crops and lands. During the last 54 years in Pakistan, the total losses ascribable to floods are of the order of US $ 10 billion, while more than 6,000 people lost their lives. People living in marooned areas become extremely distressed due to floods. Unfortunately, these people often do not find adequate and appropriate shelters; quality food and drinking water; adequate and hygienic sanitation; privacy for women, particularly for the lactating mothers and adolescent women etc. These disasters not only affect micro and household – level activities but also have macro-economic / poverty and vulnerability implications. A detailed survey was conducted in Chashma-Taunsa reach which is located on the river Indus, starting from Chashma Barrage upto Taunsa Barrage. This reach covers 146 river miles distance and contains 12 villages. The purpose of the survey was to compile socio-economic profile of such riverine area and poverty assessment on the basis of Income distribution. The major findings of the study revealed skewed pattern of landownership; high family size; poor access to education and health facilities; low land use intensity and increasing land erosion and high extent of poverty. About 64.7 percent of the households were lying below poverty line.

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This analysis highlights the critical areas of intervention that should be focus of poverty reduction strategies for revirenine areas. The cross-cutting theme of socio-economic protection is vital in order to mitigate the vulnerability/ poverty in these areas.

Introduction

Indus Basin System is one of the best irrigation systems in the world which contains five main rivers, namely, the Indus, Jhelum, Chenab, Ravi and Sutlej flow through the country's plains supplemented by a number of smaller tributary rivers and streams, these rivers supply water to the entire Indus Basin Irrigation System. The contribution of the Indus Basin towards economic development of the country in the form of hydel power generation, irrigation purpose, drinking water for human beings as well as for animals, conserving and sustaining nature/ ecosystem is really remarkable, however flooding in these rivers is the major threat to the habitats. The total area of the province is 51 million acres. Area in the active flood zone is about 7.7 million acres (Govt. of Pakistan, 2006).

People living in marooned areas become extremely distressed due to floods. Unfortunately, these people often do not find adequate and appropriate shelters; quality food and drinking water; adequate and hygienic sanitation; privacy for women, particularly for the lactating mothers and adolescent women. Floods often force the students out of academic activities since their learning centers are often used as makeshift flood shelters in affected area. These disasters not only affect micro and household – level activities but also have macro-economic / poverty and vulnerability implications. According to IFPRI (International Food Policy Research Institute) panel data analysis focuses specifically on the risk imposed by weather related shocks, which are the most significant causes of income volatility in Pakistan and particularly its rural areas. It finds both a high incidence of vulnerability in Pakistan, as well as close overlap with poverty (World Bank, 2002).

Pakistan has a long history of repeated localized and widespread flooding that has caused loss of life, substantial damage to property and infrastructure and loss of agricultural crops and lands. During the last 54 years in Pakistan, the total losses ascribable to floods are of the order of US $ 10 billion, while more than 6,000 people lost their lives. Heaviest direct flood damages in Pakistan occur to infrastructure, agricultural crops, urban and rural property and public utilities. Historical flood damages in Pakistan are depicted in Table 1.

Table 1 Historical Flood Damages in Pakistan

Year	Value of Property Damaged (Rs. In Million)		Lives Lost	Villages Affected
	Unadjusted	Adjusted		
1950	199.80	11282.00	2190	10000
1956	155.50	7356.00	160	11609
1957	152.50	6958.00	83	4498
1973	5137.00	118684.00	474	9719
1976	5880.00	80504.00	425	18390
1978	4478.00	51489.00	393	9199
1988	6879.00	25630.00	508	1000
1992	34751.00	69580.00	1008	13208
1995	6125.00	6898.00	591	6852
2001	450.00	450.00	219	50
2002	* -	-	-	-
Total	**64207.8**	**380631.00**	**6051**	**84525**

Source: Government of the Punjab (2003). , Ali (2003)., Ali (1989).
*:No loss of life and property have been reported

In the history of Punjab, floods have created heavy damages to property and infrastructure. The major losses of the floods of 1992 are shown in the Table 2.

Table 2 Major Damages of 1992 Flood in Punjab

Particulars	Unit	Damages Due to Rains	Damages Due to Floods	Total
Villages	No.	2,391	4,186	6,577
Persons Affected	No.	3,76,601	37,62,341	41,38,942
Area Affected	Acres	10,53,226	46,88,677	57,41,903
Crops Affected	Acres	3,77,527	24,30,261	28,07,788
Houses Damages	No.	36,721	189,064	225,785
Houses Demolished/ Washed away	No.	15,571	141,113	156,683
Persons Died	No.	43	347	390
Cattle Heads Lost	No.	98	39,028	39,126

Source: Haq (1992).

Objectives of the Study

The major objective for conducting survey in research area i.e Chashma-Taunsa reach was to explore the socio-economic profiles of the flood hit riverine areas and to measure labor force participation in the selected area along with the assessment of poverty on the basis of income distribution.

Materials and Methods

A cross-sectional survey was conducted in Chashma-Taunsa reach which is located on the river Indus, starting from Chashma barrage upto Taunsa barrage which covers 146 river miles distance and contains 12 villages for investigating the research objectives. A comprehensive pre-tested structured questionnaire was designed in the light of research objectives to collect the required information / data. The following statistical formula as suggested by Casley & Kumar for this type of study to determine sample size is used.

$$n = \frac{N Z^2 S^2}{N d^2 + Z^2 S^2}$$

Where:

n	=	Number of sample respondents
N	=	Total number of Households i.e., 8000
Z	=	Normal variate at 90 percent precision level i.e., (1.64)
d	=	Accepted error i.e., 6.5 percent
S	=	Guessed variability among sampling units (50 percent) for the maximum sample size

According the above mentioned values, the sample size is:

$$n = \frac{8000 \text{ x } (50)^2 \text{ x } (1.64)^2}{8000 \text{ x } (6.5)^2 + (50)^2 \text{ x } (1.64)^2}$$

$$= 156$$

Thus, 156 sample respondents were proportionately distributed between the sample villages.

Results and Discussion

Socio-economic and demographic characteristics

Total population of the project area i.e., was 82,000, consisting of 50.5 percent females and 49.5 percent males. The dominant castes of the respondents of the project area were Jat, Suggu, Rajput, Kat, Uthra, Noon, Malana, Syed and Bha. The average family size of sample of the respondents was 8.28. 54 percent of the households belonged to non-farm families while the remaining were farm families. According to survey results the number of business enterprises, i.e. poultry farms, general stores, ata chaki (flour machines), oil extractor, and carpet weaving etc., operating in sample villages / localities were the common the selected area shown in Table 3. Majority (63 percent) of the family members were engaged in farm activities i.e. agriculture and livestock care. About 37 percent of family members were engaged various non-farm jobs, like Government service, technical jobs, labour / self employees etc. (Table 4).

Table 3 Business Activities / Units

Poultry Farm		Dairy Farm		General Stores		Flour Machines		Oil Processing		Carpet Weaving	
Total No.	Per village / Locality No.	Total No.	Per village / Locality No.	Total No.	Per village / Locality No.	Total No.	Per village / Locality No.	Total No.	Per village / Locality No.	Total No.	Per village / Locality No.
20	1.7	2	0.2	366	30.5	75	6.25	2	0.2	5	0.4

Table 4 : Major Professions

Agriculture				Non-Farm					
Farming		Livestock Care		Technical Job		Labour/ Self Employed		Govt. Service	
No.	%	No.	%	No.	%	No.	%	No.	%
157	30.0	172	33.0	24	5.0	135	26.0	35	6.0

Basic Amenities Available

Basic amenities available to the communities like, housing, educational institutions, health facilities, roads and street payment, water supply, sanitation / drainage and village electrifications were examined. Survey results show that 41 percent households had pacca houses, 32 percent hade katcha houses and 27

percent had mix type i.e. katcha and pacca house. Access to education is vital factor which influences the lifestyle and poverty. The average number of schools per village / locality i.e., primary, middle and high on gender basis is given in Table 5.

Table 5: Educational Institutions

Boys Schools						Girls Schools					
Primary		Middle		High		Primary		Middle		High	
Total No.	Per village/ locality No.	Total No.	Per village/ locality No.	Total No.	Per village/ locality No.	Total No.	Per village/ locality No.	Total No.	Per village/ locality No.	Total No.	Per village/ locality No.
18	1.5	7	0.6	6	0.5	15	1.25	7	0.6	8	0.7

Survey findings show that at least one facility like, basic health unit, dispensary or private clinic was available in each sample village/locality and all sample villages under this reach were served with metalled road. The average length of metalled road per village was 6 km. The average length per village of street pavement with bricks was 1.97 Kms. No village / locality had proper water supply scheme. The only source of drinking water was hand pumps or motor pumps. Only 19 percent of the locality / reach area had lined drain or sewerage facility. The survey results reveal that about 75 percent of the total sample villages in the reach were electrified.

Characteristics of Farm Households

Total agricultural land vulnerable to flood in this reach was about 63,645 acres, with an average of 5,304 acres per village. Tenancy status of the sample farmers i.e., tenant, owner-cum-tenant and owner reveals that majority (59 percent) of the farmers were

owner under this reach. It was followed by owner cum tenant (34 percent) and tenant (7 percent). The average farm size of the sample farmers was 29.3 acres. Only 55 percent of the farm area was cultivated area, due to culturable waste or land had been eroded by the river. It was also estimated that about 12.7 acres per household i.e., 43 percent of farm area had been eroded due to flooding or erosion. Land use intensity on sample farms was 55.2 percent, on an average. In Kharif season major proportion (24.92 percent) of the cultivated area was under pulses (Table 6). It was followed by fodder (4.37 percent), cotton (4.2 percent), rice (0.92 percent) and vegetables (0.82 percent). During Rabi season wheat was grown on 32.34 percent of the area. Other major crops were Gram (19.74 percent) pulses (9.08 percent) vegetables (7.06 percent) and fodder (2.96 percent). Copping intensity of sample farms was 158 percent, on an average.

Table 6: Cropping Pattern

Crop Season	Crop Name	Cropping Pattern (%)
Kharif	Cotton	4.21
	Rice	0.92
	Maize Grain	0.41
	Pulses	24.92
	Vegetable	0.82
	Fodder	4.37
	Others	0.60
Rabi	Wheat	32.34
	Gram	19.74
	Pulses	1.08
	Vegetable	7.06
	Fodder	2.96
	Others	0.67

Livestock Strength

The strength of livestock kept plays a vital role in addressing the poverty in rural areas of Pakistan and livestock sector has great potential to boost the national economy and alleviate rural poverty. The table 7 indicates that the strength of livestock kept can be enhanced. Average strength of buffaloes, cows, goats, camels was about 4.4 per household. This is an important area need to be addressed.

Table 7 Livestock Strength

(No. of Animals per household)

Buffalo	Cow	Goat	Other
1.2	1.7	1.3	0.2

Farm and Household Assets

During survey, information regarding ownership of selected household assets of both farm and non-farm households included tractor, tubewell, refrigerator, TV / Radio, motorcycle, car, etc. Table 8 shows the proportion of households had these items. Majority of respondents had tube-well (48.0%) followed by respondents who had TV/Radio and their percentage was 20.0. It can be said that economic aspect as assessed from their assets seems unsatisfied as it reflects from their income given in table 9.

Table 8 Farm and Household Assets Owned by Sample Respondents

Households Assets	Percentage of Households
Tractor	8.9
Tube well	48.0
Refrigerator	14.3
TV/Radio	20.0
Motorcycle	8.3
Car	3.6

Household Income/ Poverty Assessment

Survey findings exhibit that about 53 percent of the family members were engaged in various economic activities and participating in labour force. The persons above 15 years were counted in the labour force available. Household cash income was calculated on the basis of crops, livestock, jobs/services, enterprises and remittances. The average household cash income was Rs. 106,610. This distribution of households by household cash income is reflected in Table 9. The average per capita income was Rs. 13001 per annum indicating the majority people in the selected area are deprived from basic necessities of life and live in poor conditions.

Table 9 Household Cash Income Distribution

Income Groups (Rs. / Annum)	Households (%)
Upto 45000	**53.9**
45001-90000	**10.8**
90001-135000	**19.2**
Above 135000	**16.2**

Extent of Households in Poverty

According to Economic Survey 2005-6, the poverty line in 2004-05 approximates Rs. 878 per capita per month. On household basis the poverty line thus comes to approximately Rs.90,000 per annum. The survey finding shows that 64.7 percent of the households were lying below poverty line i.e. they had cash income upto Rs. 90,000 or less. The severity of poverty can be gauged from the fact that 53.9 percent of sample respondents had income upto Rs. 45000 (Govt. of Pakistan, 2006).

Table 10 Poverty Indicators 2001 - 2004-5

Particulars	Headcount		Poverty Gap		Severity of Poverty	
	2001	2005	2001	2005	2001	2005
Pakistan	34.46	23.90	7.03	4.76	2.13	1.48
Urban	22.69	14.90	4.55	2.87	1.35	0.84
Rural	39.26	28.10	8.04	5.64	2.44	1.77
Poverty line	723.40	878.64				

Source: Govt. of Pakistan, (2006).
The above analysis highlights the critical areas of intervention that should be focussed of poverty reduction strategies for revirenine areas. The cross-cutting theme of socio-economic protection is vital in order to mitigate the vulnerability/ poverty in these areas.

Conclusion/Recommendations
Skewed Pattern of Landownership
In rural areas no land ownership and non-farm households are major contributing factors of rural poverty. Study findings show that about 54 percent of total households belonged to non farm families and 59 percent of the farmers were owner cultivator. According to the Government of Pakistan (2005) 79 percent of the farms are being operated by owner cultivators. To address this gap Government should take special initiatives.

High Family Size
The average family size in study area was 8.28. At Punjab level it is 6.9 (Govt. of Pakistan, 2005). Large family size is remarkable hindrance in poverty alleviation. There is need of attitudinal change towards family size and sex preference. The government should use all possible interpersonal and media channels to popularize the norms of small family. Availability and accessibility of health care and family planning services should be ensured.

Poor Access to Education and Health Facilities
According to study findings, about 1.5 - 2 villages (having 10,000 – 13,000 population) had one middle and high school, both in case of boys and girls, on an average. With regard to health facilities one facility like, basic health unit, dispensary or private clinic was available in each village / locality (about 7000 population). Thus, special attention should be given on this important area which is a key towards poverty alleviation. Without healthy nation, the dream of economic development can never be fulfilled.

Poor Access to Critical Infrastructure
Study revealed that about 25 % of the villages were not electrified. No village was equipped with safe and improved drinking water facility. This shows very critical situation with reference to achievements in MDGs/ poverty reduction (Govt. of Pakistan, Pakistan Social Living, 2005). The development and establishment of infrastructure in any society guarantee for economic prosperity and social development.

Low Land Use Intensity and Increasing Land Erosion
As per results, only 55 percent of the farm area was cultivated area, due to culturable waste or land had been eroded by the river. Whereas, according to Govt. of Pakistan (2005), the land use intensity is 71%, on an average. As for as extent of land erosion is concerned, about 43 percent of farm area had been eroded due to erosion, which was continuous threat of vulnerability and resulted in poverty.

Less Livestock Strength
Livestock play a pivotal role in rural economy and directly contribute towards poverty alleviation particularly in riverine areas as easily can be moved during floods. The survey results show 4.4 livestock per household, which is too low as compared to national and provincial statistics. According to Govt. of Pakistan, Pakistan Livestock Statistics (2006) the livestock strength per household is about 41.35 while it is 26.72 in case of Punjab Province. So, there are huge gaps which can be bridged by giving special attention towards livestock rearing programmes in these areas.

High Extent of Poverty
The poverty statistics show that rural poverty in Pakistan was 28.10 percent in 2004-05, as reported by the Govt. of Pakistan, Economic Survey of Pakistan, (2005-06) (Table 10). While, the survey findings show that 64.7 percent of the households were lying below poverty line. Thus, it is evident from the poverty analysis that the economic situation in riverine areas was far worse even than the poverty in rural areas as their lives and property is always at high risk of flooding / erosion. Special efforts are needed to improve the socio-economic conditions for the peoples of these and to address serious issue of poverty.

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