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UNDERSTANDING RURAL POVERTY DYNAMICS: THE CASE OF THE POOREST DISTRICT OF SINDH PAKISTAN

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SUMMARY

This research focuses on changes in the poverty status of rural households to explore the main determinants of upward and downward income and poverty mobility. The study uses panel survey data for District Badin, which is among the poorest districts of the Sindh province. Households interviewed earlier by the International Food Policy Research Institute (IFPRI) during 1986-91, were surveyed again in 2005 with almost identical survey instruments. Household characteristics in terms of demography, human capital, physical capital and income composition are analyzed with reference to households falling into poverty and those overcoming poverty during the period of analysis. On the basis of field observations and statistical analysis of panel data, the paper recommends public policies to escape from poverty in future. The analysis suggests that in deprived rural regions, education, especially female education as well as non-farm income opportunities and crop diversification are the major drivers for escaping poverty.

1. PREFACE

Identifying the pattern of change in welfare and poverty over time is of increasing importance in the policy debate about reforms in developing countries. Knowledge of the dynamics of poverty is significant because poverty persistence and transitions seem to have different causes and require different policy interventions. The increasing availability of databases of longitudinal information has boosted the study of inter-temporal poverty status. Thus, issues such as the persistence of poverty, falling into, and climbing out of as well as falling back into poverty, the characteristics of households that stimulate exit from this situation and other such issues are rigorously analyzed by researchers. An excellent summary of conceptual framework for analyzing economic mobility and poverty used in the literature of poverty dynamics by various authors and for different counties is provided by Baulch and Hoddinott (2000), in the special issue of *The Journal of Development Studies*. They also present a summary of emerging conclusions and their implication for public policies.

In the context of Pakistan, McCulloch and Baulch (1998, 1999), investigated issues related with poverty transition and persistence using household panel data study for rural Pakistan between 1986-87 and 1990-91. They showed that "some 70 percent of aggregate poverty is known to be transitory" and suggested that "while the current emphasis on sectoral (and in some countries geographical) interventions to improve the human and physical capital of the poor are likely to be successful in the long-run in reducing chronic poverty, in the short-term potentially much larger reductions in aggregate income poverty might be achieved. This can be done by enhancing households' ability to smooth incomes across time. Interventions to achieve such improvements might include the provision of micro-credit, seasonal public works, crop insurance and food price stabilization schemes. However, the most appropriate ways of smoothing incomes will clearly depend upon the nature of market failures in a specific context".

McCulloch and Baulch analyzed chronic and transitory poverty with the short time span. This study adds to the existing literature on poverty dynamics for developing countries by analyzing poverty persistence and transition using a long interval between two survey periods (17 years). The study uses panel survey data for District Badin, which is among the poorest districts of Sindh, Pakistan. Households, interviewed earlier by International Food Policy Research Institute (IFPRI) were re-surveyed in 2005 with almost identical survey instruments. The findings might be useful for designing appropriate rural poverty reduction strategies for deprived regions and areas in terms of socio-economic and infrastructure development.

The paper has seven sections including the Preface. Section 2 furnishes a brief description about the sample district Badin. The information regarding data sets are provided in section 3. Household welfare indicators in various dimensions are analyzed to see the changes during baseline and re-survey periods. Section 4 presents these results. The estimates of poverty dynamics in term of inter-temporal poverty transition matrix are

provided in section 5, while drivers or determinants for escape from and descent into poverty are statistically analyzed in section 6. Finally, the last section offers some concluding remarks.

2.   THE SAMPLE DISTRICT

Badin district[1] is a part of Lower Indus plain formed by the alluvial deposits of the Indus River through the ancient streams of Hakra, Nullah and Gungra. Being a vast alluvial plain, its land is very uniform in character and is not diversified by hills or rivers. The southern part of the district is close to the delta of the river Indus and the land surface is, therefore, relatively low as compared to the northern half. The general elevation of the district is about 50 meters above sea level. The Eastern part of the district is connected with the sand dunes of Tharparkar district. The slope of the area in Badin is negligible with water table within a depth of 240 cm in winter and 150 cm in summer. The drainage system is grossly inadequate and poorly maintained. The system, therefore, does not have the capacity to carry even a nominal increase in the precipitation. Flood conditions are created when the canal and saline water from the irrigation and drainage systems flows into the area.

About 84 percent of the population of Badin district lives in rural areas and farming is their main occupation. Badin district is the major grower of rice and sugarcane in Sindh province. Other crops grown include cotton, wheat, barley, sunflower, vegetables and melons. The district is irrigated from Sukkur and Kotri Barrages and is located at the extreme tail end. The drainage capability of irrigated soils of Badin is very low. Therefore, salinity and water logging is a major problem. In recent years, this problem has been further compounded by inadequate irrigation water availability.

The total geographical area of Badin district is 1.7 million acres while the reported area is 1.4 million acres. The cultivated area is reported to be 0.8 million acres. However, the net cropped area is only about 0.3 million acres, mainly because of lack of irrigation water. The area under forest is 29,554 acres (1.73 percent only). The area not available for cultivation is estimated to be 0.4 million acres while the area under cultivable waste is determined to be 0.2 million acres.

The farmers still use traditional methods. They have little awareness about modern farming techniques and no access to extension programs and support services such as credit and marketing. Health facilities are at a minimum scale in the coastal areas of Badin. A lack of maternity homes and unavailability of' trained midwives results in great suffering to women, especially during pre and post-natal care. Malnutrition of women directly affects the health of the children. In the case of natural disasters, especially floods and cyclones, the people suffer due to a lack of communication with the nearby

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[1] This part is mainly extracted from the report "Sustainable Development Vision and Conservation Strategy for Badin District", prepared by Dr. Rajab Ali Memon for IUCN (April, 2005).

towns. In rural areas, the literacy rate is low, especially of girls. Besides household work, the women are also responsible for looking after the livestock and fetching water from distant areas.

The data on farm size reveal that the number of farms and farm area increased from 1990 to 2000 in Badin. Maximum area now falls under farm size 25 to 50 acres of land (22.7 percent), followed by farm size 12.5 to 25 acres (18.57 percent), farm size 25 acres to 50 acres (14.99 percent), farm size 50 to 100 acres (14.06 percent) and farm size 100 to 150 acres (6.08 percent). Among subsistence farms, the farms of size 7.5 to 12.5 acres are 12.9 percent, 5 to 7.5 acres are 5.07 percent and 2.5 to 5 acres are 4.76 percent of the total number of farms. The farm size data reveals that Badin is essentially a district of medium and large farmers where farm sizes above 25 acres constitute 57 percent of land holdings.

3.   THE DATA SETS

The data sets used for this study is a longitudinal survey of rural households in Badin district of Sindh, Pakistan. This section provides a brief survey methodology to the baseline panel survey which was conducted by the International Food Policy Research Institute (IFPRI) during July 1986 and October 1991 in the four provinces of Pakistan with the collaboration of local (provincial) institutions in the country.[2] It also furnishes details of the re-survey of the same households carried out in 2005.

3.1   Baseline Survey

The study districts were chosen purposively by IFPRI.[3] These were selected through preparing a list of the poorest districts[4] in each province of the country. Selection of the poorest district was based on a variety of production and infrastructure indices, following the results of district ranking by Pasha and Hassan (1982). This led to the selection of Attock in Punjab province, Badin in Sindh province, Dir in the North West Frontier Province (NWFP), Kalat in Balochistan[5] and Faisalabad, one of the prosperous districts in Punjab, as a 'control' district. The incorporation of Faisalabad was in recognition of the existence of poor households in prosperous districts.

While the choice of districts was purposive for this panel survey, the villages and households within each district comprised a stratified random sample. Within each of the

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[2] The four institutions were: Applied Economic Research Center (AERC), University of Karachi (Sindh), the Punjab Economic Research Institute (Lahore, Punjab)), the University of Balochistan, and the Center for Applied Economic Studies, University of Peshawar (NWFP).

[3] For a detail discussion on survey methodology, see Alderman and Garcia (1993).

[4] The data is, therefore, not representative for Pakistan or rural Pakistan, but except for Faisalabad, which was selected as a more prosperous control district, it can be regarded as representative for the poor rural areas in Pakistan.

[5] District Kalat (Baluchistan) was dropped later due to logistical problems in continuing the survey.

selected districts, two markets or *Mandis* were first chosen at random. For each market (*Mandi)* selected, three lists of villages were then constructed on the basis of distance from the market: villages within 5 kilometers of the market*,* villages between 5 and 10 kilometers; and those between 10 and 20 kilometers. Villages were then chosen randomly from these lists. Similarly, households were also chosen randomly from the lists of all households in a particular village. Some minor variations in this process were made to take special account of local conditions in each of the selected districts in the study.

The realized sample for the IFPRI study was 727 households. It is distributed among the four districts as follows: 148 from Attock District (Punjab Province), 239 for Badin (Sindh Province), 193 from Dir (North West Frontier Province), and 147 from Faisalabad District (Punjab Province).

Each household in the survey was visited up to 14 times. The initial 12 rounds of the survey were conducted during the period starting from 1986 to 1989. These rounds are distributed into six in first agricultural year during 1986-87, and three each in the following two years - 1987-88 and 1988-89. The remaining two rounds were conducted during the last two years of the survey from 1989-1991. The interviews were conducted by a team comprising three males and three females in each district. A specific male and female questionnaire was administered to each household.

The information collected in these interviews were organized into the following ten major modules: Household information regarding demography and education; Land ownership and tenurial status Crop production and distribution; Household farm and non-farm expenditures including weekly recall of food intake for 37 items; Labour use of farm household by gender and age; Value and type of assets owned including farm tools and durable assets; Household credit by sources of credit and purpose of credit; Livestock and poultry ownership and income; Fertility, children's health and nutrition; and Sources of transfer income .

In addition, a village questionnaire was also administered. Information on prices and yields of major crops, existence of basic social and physical infrastructure, basic health facilities, prices of livestock and prevailing wage rates in the study villages were gathered through the village questionnaire.

3.2   Re-Survey, 2005
The 2005 re-survey[6] of households in district Badin was conducted from May 1 to end of June 2005. It satisfactorily implemented fieldwork in all 28 villages surveyed seventeen years ago by IFPRI in Badin district, Sindh province. Almost identical survey instruments (male, female and village questionnaire) were administered during the re-survey.

A detailed information was required for reconfirmation of panel household's identity and status before starting any interview. It included reconfirmation of head of household's name, his cast and an idea of present family size. If there was a marked difference in the two periods, then additional questions were asked about increased or missing numbers in a family. After confirming the status of the original household, questions were asked to update information on the household head i.e. whether the original head of household is alive or not. It followed, then, to ask whether the members of the household were still living together as before or whether some members were living separately and had started their own independent life. In cases where 'new households' were formed from the 'original' panel household, then details of their present location, and the head of household was also collected.

Table 3.1 and 3.2, provide summary information for the interviews completed during the re-survey of 2005. These tables show that 95 percent households were traced and interviewed during the re-survey (96 percent from 'Taluka'[7] Badin and 93 percent from 'Taluka' Golarchi). About 5 percent of households either migrated, or refused to be interviewed. Moreover, the head was alive in 147 out of 226 panel households (about 65 percent). In 'successor' category, although family members are living together as before, the head has expired and now the new head is the eldest member of the family. About 20 percent (44 households) were in this category (Table 3.2). The 'split' category consists of two types of households. One, the panel head of household is alive; however, there is a 'split' in the family. In these cases 'new households' from this panel are also selected for the interview in addition to the original households. The original panel member is retained as 'same' household, whereas, split members from this, one or more than one, are treated as 'new households.' The second type of households in 'split' category are those where 'original head of panel household' had died, and his family has also 'split' into two or more than two 'new households.' There were 35 households (15 percent) in the 'split' category.

TABLE – 3.1 SUMMARY OF INTERVIEWS IN RE-SURVEY 2005					
	IFPRI Sample 1986-91	Re – Survey 2005			
		Panel Households		New Households	Total Interviews
		Interviewed	Not Interviewed		
Badin District	239	226	13	45	271
'Taulka' Badin	134	128	6	28	156
'Taulka' Golarchi	105	98	7	17	115

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[7] 'Taluka' is sub-district administrative unit.

TABLE – 3.2 CATEGORIES OF PANEL HOUSEHOLDS INTERVIEWED IN 2005				
	Total	**SAME**	**SUCCESSOR**	**SPLIT**
Badin District	226	147	44	35
'Taulka' Badin	128	82	27	19
'Taulka' Golarchi	98	65	17	16

To ensure consistency between the two surveys, additional training for data collection methods was obtained from personnel[8] who conducted the baseline survey by the Applied Economics Research Centre (AERC), University of Karachi. The main purpose of this training was to get orientation for the baseline survey and methods used for data collection.

4. THE PROFILE OF CHANGES

A long interval between the two surveys provides a rare opportunity to analyze changes for cropping pattern, yields, occupational structure and social changes for the sample. Following subsections, based on household surveys by IFPRI[9] (1988), and re-survey (2005), evaluate these changes.

4.1 Changes in Crop Cultivation
Table 4.1 furnishes information about cropping pattern[10] in the area. Main crops for *Kharif* are rice, sugarcane and cotton, whereas, for *Rabi* are wheat, barley and sunflower.

Three main changes are visible in Rabi crop cultivation. First, area under wheat has increased significantly from 16 percent to 27 percent with on average 4 percent annual growth. Second, there is an emergence of a new cash crop (sunflower) in the area. Third, area under barley cultivation has declined drastically from 17 percent in 1988 to only 8 percent in 2005. Fourth, there is a significant decline in fallow land, from 43 percent in 1988 to 8 percent in 2005.

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[8] The services of one supervisor of IFPRI survey – 1988 were also hired for field enumeration. Valuable input provided by Mr. Shafi Ahmad of AERC is highly acknowledged. He remained in the field during the re-survey and helped out in identification of household and in interpretation of question of different modules.

[9] Although IFPRI data is available from 1986/87 to 1990/91, the period from 1987 to 1988 is chosen to compare with re-survey of 2005, for the analysis in this paper. Both survey years: 2005 as well as 1988 were good harvest years, according to household perceptions.

[10] Agricultural year (starting from May) in Pakistan is divided into two main seasons' Kharif' (monsoon) and 'Rabi' (winter). Agricultural information were collected from May 1987 to April 1988 for the baseline survey. Similarly, survey year 2005 refers to the period from May 2004 to May 2005.

In the Kharif season, rice remains a dominant crop with its cultivation increasing from 47 percent to 59 percent over the period of study. Second, the cultivation for minor cash crops like, *hurbo*, chilli and oil seeds has increased. A main reason for the increased preference for oil seeds is the low water requirement of the crop and high market demand in the area. Area under cultivation of sugarcane, an annual crop, has declined from 24 percent in 1988 to 15 percent in 2005. There has been a negative annual growth rate at -2 percent for sugarcane in the area.

TABLE – 4.1 CROPPING PATTERNS [Area under crop as a percentage of total cultivated area]		
	1988	2005
RABI SEASON		
Wheat	16	27
Barley	17	8
Pulses	4	0
Sunflower	0	27
Vegetables and Spices (e.g. Onions)	9	2
Fodder	11	10
Sugarcane (annual crop)	0	19
Fallow Land	43	8
Total	100	100
KHARIF SEASON		
Rice (Irri)	47	59
Sugarcane (annual crop)	24	12
Minor Cash Crops (or example, janter, chilli and hurbo)	0	14
Oil Seeds (canola and torio)	0	7
Vegetable and Other Minor Food Crops	7	4
Fodder	8	1
Fallow Land	14	4
Total	100	100
Source: IFPRI household survey: 1987/8 and Re-survey IFPRI household: 2005.		

Some explanations for the major changes in the area are in order. First, it seems that farmers in the area have a preference for traditional food crops like wheat and rice, which has continued and increased over the period. Second is the explanation for the rise in sunflower at the cost of sugarcane (most profitable crop) cultivation. Farmers reported two reasons: sugarcane cultivation requires intensive and constant water availability all round the year. Second, prices are affected by the uncertainty in government policy over the past few years. The district is facing severe water shortage. It was also informed that there is no clear and consistent policy for price and payment and purchase of sugarcane. For instance, price for the crop is not announced in advance and there is high uncertainty regarding the price until the last moment. Similarly, payments for the crop sold are

delayed for months at the sugar mills. All these factors make sugarcane uneconomical for cultivation in the area. In comparison to sugarcane, farmers find sunflower to be a more economical crop since it requires comparatively less water, its crop duration is shorter and is easier to sell with no hindrances in receiving crop payment. Due to this popular view, sunflower is fast replacing sugarcane in the area.

Third point which merits mention is the mysterious decline in fallow land for the Rabi season. Apparently, the water shortage and decline in fallow land may seem to be in contradiction. One possible explanation for this might be that since the overall increase for sunflower is higher than the decline in sugarcane, so increased area under sunflower is also being utilized from the fallow land. Also, the increased area under wheat was also previously fallow land. In case of sunflower, this explanation makes sense as sunflower does not require much water. However, in the case of wheat, which requires water at least three to four times in a season, further qualification is needed.

4.2   Changes in Land Ownership and Household Tenurial Status

Table 4.2 reports information about household tenurial status for both survey periods. Marked changes are observed in the status of household during the period. Following are some noticeable observations.

TABLE – 4.2 HOUSEHOLD TENURIAL STATUS		
Type of Household	**1988**	**2005**
Landless	6	15
Owner-cum Tenant	25	15
Tenant	35	21
Self Cultivated	26	27
Absentee Landlord	8	21
Total	100	100
Source: IFPRI household survey: 1987/8 and Re-survey IFPRI household: 2005.		

The percent share of landless households[11] has increased from 6 to 15 percent during 1988 to 2005, showing a sharp increase in the last seventeen years. The number of households who were tenants or owner cum tenants has declined visibly during the same period. An increase is observed in those households who own land, cultivate their own

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[11] Landless households are those households who do not own land or rent any land for sharecropping or on a fixed rent. 'Owner-cum-Tenant' (OCT) are those farmers who own their land and also sharecrop on other's land as well. Tenants are those households who do not own any land and cultivate land on tenancy arrangements. These includes the arrangement of one forth and half basis. In typical tenurial arrangements, if it is for one forth, the tenant will provide labor input for different farm activities, whereas, the landowner bears full costs of machinery, fertilizers and seeds. In some cases, it was reported that the tenant bears costs for seeds in case of newly emerging cash crop of sunflower in the area. Self-cultivators are those households who own and cultivate their own farms/land. Absentee households are those landowners who own land, however, lease out total land on sharecropping on different arrangements to others. Except few cases, all were living in the same villages.

land or lease out land in different arrangements. Some explanations are offered for these marked variations from field interviews.

There was a consensus in the field regarding the increase in the costs of agricultural inputs and lower returns from output. Moreover, there was a drought during the last five years in many villages in the study area and farmers indicated severe water shortage. This situation has adversely affected the farming community. Changes were also seen in the mechanism for sharing costs of inputs under tenancy arrangements. Some tenants argued that ten to fifteen years ago, the cost of seed for cash crops like sugarcane was borne by landowner for the one-forth tenancy arrangement. However, now the landowners are no longer ready to bear the cost of seed for sugarcane and sunflower. These are the only cash crops, according to tenants, which provide some opportunity for net income at the end of the season. In addition, cost of harvesting of these crops is also demanded of the one-fourth from tenant. It was, therefore, reported that tenancy is no more a profitable practice. Finally, the uncertainty of water and risk of damage to crop due to non-availability of water on time is also an important factor of increase in landlessness and decrease in tenancy.

4.3   Changes in Operational Land Holdings
Table 4.3 reports the average magnitude of operational land holdings by different categories of farmers. Based on the above (section 4.2) arguments and facts, it is plausible to expect a marked decline in the land holding. The table indicates that average land holding has declined for all three categories. The rate of decline is almost the same for self-cultivators and owner-cum tenant, 14.6 acres to 8 acres and 14.1 acres to 7.7 acres over the period, respectively. For the tenant, average land holding has declined from 10 to 7.4 acres during the same period.

TABLE – 4.3 AVERAGE OPERATIONAL LAND HOLDINGS [Acres]			
	1988	**2005**	**Percent Change**
Self Cultivators	14.6	8	-45.2
Owner–cum-Tenant	14.1	7.7	-45.4
Tenant	10	7.4	-26.0
Source: IFPRI household survey: 1987/8 and Re-survey IFPRI household: 2005.			

4.4   Changes in Primary Occupation of the Head of the Household
Changes in the structure of head of household occupation[12] are displayed in Table 4.4. The table indicates that the share of farming as a primary occupation has declined by 20 percent among heads of households between 1988 and 2005. Moreover, primary occupation for labor service, farm and non-farm, has increased considerably. It has

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[12] 'Farmer' includes different types of tenurial status of farmers. 'Farm labour' includes labour involved in different type of farm activities, like weeding and cutting. 'Non-farm casual service' includes activities other than farm activities.

increased from 2 to 12 percent for farm labor, and from 2 to 13 percent for non-farm casual labor during the periods of study.

TABLE – 4.4 PRIMARY OCCUPATION OF HEAD OF HOUSEHOLDS [Percentage of Household]		
	1988	**2005**
Farmer	79.17	61.66
Farm Labor	2.01	11.61
Non-farm Casual Service	2.49	12.90
Private Jobs	3.91	6.92
Business	3.43	0.47
Government Service	7.46	5.16
Artisan	1.54	1.29
Source: IFPRI Household Survey: 1987/8 and Re-survey IFPRI household, 2005.		

4.5   Changes in Human Development

Changes in education at different levels are considered important for changes in household socio-economic status and might have a possible impact on future income earnings. Table 4.5 shows changes in the rate of adult literacy and magnitude of out-of-school children. An improvement in the rate of literacy, both for male and female is evident. The adult (10 years and above) literacy rate has increased from 27 to 39 percent over the period. Initial difference for literacy between male and female, however, has remained the same. In 1988, only 13 percent females were literate which improved to 16 percent in 2005. For males, the rate has improved from 39 to 60 percent during the same period. This gap has widened slightly over the period.

TABLE 4.5 HOUSEHOLD EDUCATION	Overall		Male		Female	
	1988	**2005**	**1988**	**2005**	**1988**	**2005**
Literacy Rate	26.6	39.1	38.9	59.9	12.7	16.0
Out-of-School Children	78.0	48.9	70.4	39.2	84.6	60.5
Source: IFPRI household survey: 1987/8; and Re-survey IFPRI household: 2005.						

The magnitude of out-of-school children between the ages of 5 to 9 years has declined by 29 percentage points. Main decline, however, is among the male children. For male children, the decline is by 44 percent, whereas, for female children, it is by 28 percent. In 2005, more than 60 percent female and 39 percent male children from ages 5 to 9, remained out-of-school.

4.6 Changes in Household Sources of Income

To make the comparison consistent with the baseline survey, same methodology is adopted to compute sources of income for both periods. Total income is divided into following six major sources.

- Crop profit: It includes profit from all crop production including home production, crop by-products and returns to agricultural labor.

- Agricultural wages: It comprises income from agricultural labor including wages received in the form of crop, wheat and rice, which were converted into market valuation.

- Rent: It includes income received from renting out three types of sources- machinery and capital equipment, land at fixed rent and urban property during the last 12 months.

- Livestock: It includes income from sale of milk and dairy production plus sale of bullock traction power.

- Non-farm: Income from non-farm sources includes very diverse activities, such as income earning from primary and secondary sources including income from self-employment, artisan activities and manufacturing and sale of handicrafts. In addition, it also includes net profit from running a business (including fish farming, cattle trading) and wages from private and government employment.

- Transfers: It includes income from remittances and other transfers, like *Zakat* and pension received during the last 12 months.

Following are some observations from Table 4.6 which display information regarding household sources[13] of income for baseline as well as re-survey, 2005.

TABLE – 4.6 HOUSEHOLD SOURCES OF INCOME			
	As a Percent of Total Income		Percentage Change
	1988	**2005**	
Crop Profit	34.26	34.07	-1
Nonfarm	29.76	51.59	73
Livestock	18.84	6.15	-67
Rent	8.16	2.6	-68
Transfers	5.04	1.71	-66
Agricultural wages	3.94	3.88	-2
Source: IFPRI household survey: 1987/8 and Re-survey IFPRI household: 2005.			

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[13] Shares are computed after adjusting the losses.

The 'non-farm' source has replaced 'crop profit' as the major source of income in the sample. In 1988, the highest share in income was coming from crop profit. After 17 years in 2005, more than fifty percent of total income was from non-farm sources. The phenomenon however, was also reported by other studies as well that even farm households in Pakistan rely heavily on non-farm earnings and share for non-farm is increasing for rural households.[14] One important implication that might be argued is that a shift to non-farm income suggests a reconsideration of rural development strategies as a broader array of policies rather than focusing only at the agricultural sector. Income shares for livestock, rents and transfers have declined over the period. For livestock, it has declined from 19 to 6 percent, whereas for rent it has declined from 8 to 3 percent.

4.7   Changes in Rural Wages

Wages for agricultural labor and for rural areas of Pakistan were reported to be high during the late 1980's. Alderman and Garcia (1993), argue that wages in rural Pakistan, in terms of purchasing power of the amount of wheat that agricultural laborers could purchase, were higher than neighboring countries during the late eighties in the country. Information from the field based on community questionnaire, 2005, reveals that purchasing power of labor from daily wages has declined over the period. In 1988, an agricultural laborer was able to purchase above 9 kilograms of wheat flour from his daily wage income, whereas in 2005, a laborer in these areas was able to buy only 7 kilograms of wheat. This indicates a decline in the purchasing power of rural labor, between 1988 and 2005.[15] An explanation for this decline may be a meager increase in productivity and a lack of minimum wage rate policy.

4.8   Changes in Household Income

Table 4.7 displays information regarding household income[16] for both survey periods. The table clearly indicates a decline in real[17] income during the period of analysis. According to the table, average real per capita monthly income for sample households has declined by 23 percent, while a decline of 24 percent is computed in terms of Adult Equivalent Unit (AEU).[18]

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[14] For a discussion on this, see Alderman and Garcia (1993).

[15] Other studies also indicated declining trend in rural wages in the country. See for example, SPDC (2000) and Malik (2005).

[16]Almost identical survey instruments and same methodology (IFPRI baseline survey) is applied to ensure consistency in computing income for 2005.

[17] Nominal income is converted into real by applying GDP deflator for agriculture sector (a factor of 3.5 for the period of analysis).

[18] The equivalent scale is based on World Health Organization (WHO) recommended equivalent scale as quoted in McCulloch and Baulch (2000).

It is difficult to comment that how much of this decline can be explained either by changes in real prices of crops, decline in real wages or shocks across villages in study area. Similar concerns may also arise by considering how much decline/changes in real income and expenditures are due to measurement error or response error. Nevertheless, this decline

TABLE 4.7 MONTHLY HOUSEHOLD INCOME			
	1988	**2005**	**Percent Change**
Per Capita Income (Nominal)	267	720	70
Per Capita Income (Real)	----	206	-23
Per Adult Equivalent Unit (Nominal)	329	873	65
Per Adult Equivalent Unit (Real)	----	249	-24
Source: IFPRI household survey: 1987/8 and Re-survey IFPRI household: 2005.			

raises important questions for sustained growth in the economy in general and composition of agricultural growth in particular.

5. THE DYNAMICS OF POVERTY STATUS

It is perhaps not straightforward to get a reasonable poverty line for inter-temporal poverty comparison.[19] One possibility in case of Pakistan is to use the official poverty line: Rs878.64 per capita per month for 2004-05. However, it is only available at national level, not separately for rural and urban areas. Moreover, in the absence of any appropriate price index[20] for rural areas, it is also not recommended to use it for 1987-88 after deflating. It is, therefore, decided to use the poverty lines for 1988 and 2005, as estimated by Jamal (2002, 2007). He applied consistent methodology for defining and computing national and regional poverty lines and poverty incidences. These poverty lines are estimated using household surveys for respective periods. The absolute poverty line adopted for the present analysis is: Rs225 per capita per month for baseline period, 1987-8; and Rs778 per capita per month for 2004-5.

Table 5.1 reports the estimates of poverty incidence in panel[21] sample households for both survey periods. According to the table, 55 percent households were below the poverty

TABLE – 5.1 HOUSEHOLD POVERTY STATUS – 2005 V/S 1988 [Percentage of Households below the Absolute Poverty Lines]			
	Poverty Status – 2005		**Total**
	Poor	**Non-Poor**	**%**
Poverty Status - 1988			
Poor	41.4	14.0	55.4
Non-Poor	29.3	15.3	44.6
Overall	**70.7**	**29.3**	**100.0**

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[19] For discussion on various issues, see Deaton, A. (2004). Various issues related to the selection of poverty line and inter-temporal comparison of poverty in Pakistan are discussed in ODI (2002), and Gazder (1999).

[20] Consumer Price Index (CPI) in Pakistan has no or inadequate coverage of price changes in rural areas and many researcher and institutions has raised serious concerns for its appropriateness to gauge rural inflation.

[21] Four households were dropped due to some missing information. Therefore, analysis below is based on 222 panel households

line during 1988. The percentage of poor households in the re-survey year shows a marked increase. According to the estimates, nearly 70 percent of household were poor in 2005.

Table 5.2 summarizes the changes in poverty status during 1988-2005, on the basis of absolute poverty lines. Households are classified into four categories according to the poverty cut-off points for both periods as show in Table 5.1. 'Never Poor' and 'Chronic Poor' categories indicate the percentage of immobile households which remained stagnant in their position. The other two categories

TABLE – 5.2 HOUSEHOLD MOBILITY OF POVERTY STATUS [1988 – 2005] [According to Absolute Poverty Lines]	
Mobility Status	**%**
Never Poor (Household not Poor in both periods)	15.3
Ascending Households (Households Moving out of Poverty)	14.0
Descending Households (Households Moving into Poverty)	29.3
Chronic Poor (Poor Households in both periods)	41.4

consist of ascending households (upward mobility – poor in 1988 and not-poor in 2005) and descending households (downward mobility – not-poor in 1988 and poor in 2005). The table indicates that percentage of poverty persistence is about 41 percent, while according to the absolute poverty lines, the percentage of 'never poor' households in both periods is only 14 percent.

Alternatively, a relative income distribution or relative poverty is also used for sketching poverty dynamics. Table 5.3 furnishes household distribution according to per capita income quartiles for both periods. Inter-temporal income quartile matrix indicates a lot of mobility. It is estimated that about 31 percent households remained in the same quartile during 1988-2005, while 35 percent moved up in upper quartiles.

TABLE – 5.3 HOUSEHOLD RELATIVE INCOME STATUS [2005 V/S 1988] [Percentage of Households in Per Capita Income Quartiles]				
	Quartiles – 2005			
	First [Poorest]	**Second**	**Third**	**Forth [Richest]**
Quartiles – 1988				
First	8.1	6.8	6.3	3.2
Second	5.9	4.5	7.7	7.2
Third	5.9	8.6	7.2	3.6
Forth	5.0	5.0	4.1	10.9
Total	**24.9**	**24.9**	**25.3**	**24.9**

Assuming households in the two lowest quartiles (lowest 50 percent in terms of per capita) were poor in the baseline survey of 1988, per capita income cutoff point is computed for 1988. This cutoff point is inflated using Agriculture GDP deflator to ascertain minimum per capita income requirement for 2005, to escape from poverty. On

Table – 5.4 Relative Mobility of Poverty Status [1988 – 2005] [According to Two Lowest Per Capita Income Quartiles]	
Mobility Status	%
Never Poor (Household not Poor in both periods)	18.0
Ascending Households (Households Moving out of Poverty)	14.9
Descending Households (Households Moving into Poverty)	32.4
Chronic Poor (Poor Households in both periods)	34.7

the basis of these cutoffs, relative inter-temporal transition matrix is prepared. The estimates are reported in Table 5.4.

The table narrates that about 35 percent households as chronic poor (remained poor), while 18 percent households remained above the poverty line in both periods. Moreover, 32 percent households have fallen into poverty, while the estimated percentage of households which escaped from poverty is about 15. The classification of households in terms of relative poverty mobility, described in Table 5.4, will be further used in the following section to statistically evaluate the determinants of poverty dynamics.

6. THE DETERMINANTS

6.1 Estimation Techniques
A number of different approaches have been used to understand the factors associated with poverty dynamics in a multi-variate econometric setting. Two widely referred approaches are replicated for this study to ascertain the determinants of poverty status.

Following Woolard and Klasen (2004), factors influencing the change in household living standard are modeled with change in household income. Consequently, the dependent variable is change in the real adult equivalent household income during the period from 1988 and 2005. The first-difference variables (regressors) include changes in demography, human and physical capital, income compositions, variables related to major agricultural activities and characteristics of head of household.

The advantage of this approach is that it is not sensitive to the level at which the poverty line is set. Moreover, it avoids loss of a substantial amount of information about the household living standards by using a continuous (household income) dependent variable as against discrete (poor and not-poor) dependent variable.

The discrete dependent variable approach to measure dynamics of poverty is also widely used by researchers working on economic and poverty mobility. Besides, its disadvantage of losing information, it helps to understand the relative influence of different household characteristics on its poverty status (poor, not-poor, chronic poor, ascending and descending). For this study, sequential logit and multinomial logit models are estimated with household characteristics. In sequential probil or logit[22] models, first household poverty status (poor or non-poor) in the earlier period is ascertained and the

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[22]In principle, one should use logit if one assumes the categorical dependent reflects an underlying qualitative variable (hence logit uses the binomial distribution), and use probit if one assumes the dependent reflects an underlying quantitative variable (hence probit uses the cumulative normal distribution). In practice, these alternative assumptions rarely make a difference in the conclusions, which will be the same for both logit and probit under most circumstances. Prime among these circumstances is the fact that logit regression is better if there is a heavy concentration of cases in the tails of the distributions.

second step models for each group separately the factors associated with the same household being poor or not in the second period (Lawson et al, 2006)[23].

The specific variables considered for potentials drivers of escape from and descent into poverty include: demography (family size and dependency ratio), head[24] of household characteristics (age, education, primary occupation), human development level of household (primary and secondary enrollment), land ownership, household assets score[25] composition of income from various sources, and crop related information (operation land, number of crops in each season, seasonal crop area and major crops).

6.2   Estimated Results

The average values of household characteristics are displayed in the Appendix (Table A1.1 and Table A1.2) for 'Ascending,' 'Descending,' 'Chronic' and 'Never Poor' household categories. Marked differences are evident in family size, dependency ratio, land and asset ownership and income sources among never poor versus chronic poor and ascending versus descending categories. The two groups (ascending and descending) were also statistically tested in terms of change (first difference) in important variables. In the Appendix, Table A2 reports the t-values, which if significant, reject the hypothesis of no difference in change between these two categories during 1988-2005. It is evident from the table that t-statistics are significant for dependence ratio, primary enrollment, household assets, operating land and cultivated area.

Various specifications are used to determine factors affecting change in household wellbeing. There were essentially two considerations. First, to test the relevance of human development (primary and secondary enrollments) variables in affecting change in household income. Second, whether income in earlier period is sufficient to capture the initial condition of households or other variables (demography and household assets) should be incorporated to capture the economic environment of household in the initial period. On the basis of F-statistics, it is concluded that change in primary and secondary enrollments are statistically not relevant in predicting change in household income. Further, inclusion of demography and land ownership for the base year yielded a better fit.

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[23] Lawson et al., (2006), used sequential porbit instead of logit. However, a logit specification is preferred for this study.

[24] Spouse education is also considered but not found significant across various categories of households.

[25] A constant 1 is assigned to each of the assets owned by the household, and the assets score is obtained by summing up across all assets at the household level. Of course uniform allocation of score irrespective of the asset characteristics tends to smooth out the distribution of assets across households. To the extent that these assets have different values and all exhibit different rates of depreciation, uniform allocation might even increase the distortion in the distribution of household assets. But, what actually matters in this construction is the ownership of assets by a household and not so much the values of the asset which are difficult to estimate accurately from surveys. The maximum asset score is 18 and the minimum is 0, for poorest households which possess none of the assets listed.

The results of the selected specification are furnished in Table 6.1. The adjusted R-Square, which is a measure of goodness of fit, is 0.61, indicating a good fit of the model. F-value is showing significance at 1 percent level. Multicolinearity among independent variables, which makes the coefficients statistically less efficient and insignificant, is tested through the condition index. The index value greater than 30 indicates severity of multicolinearity and points to the less reliability about the magnitude of the coefficients. The estimated results however, indicate that the value of the condition index is less than 30. Having illustrated the summary statistics of estimated function, some observations regarding factors influencing changes in household welfare are in order.

TABLE – 6.1 FACTORS INFLUENCING HOUSEHOLD WELFARE – OLS REGRESSION ESTIMATES [Dependent Variable: Δ in Log(Income Per Adult Equivalent Unit) – 1988-2005]		
Explanatory Variables	**Coefficients**	**t – Value**
Log (Income Per AEU – 1988)	-1.030	-16.268***
Family Size – 1988	-.040	-2.927***
Dependency Ratio – 1988	.325	3.231***
Head Occupation (Agriculture)	.427	2.571***
Land Ownership – 1988	.008	2.320**
'Taluka' BADIN (dummy=1)	.155	1.380
Change Variables: 1988-2005		
Family Size	-.008	-.774
Dependency Ratio	.033	.466
Owned Land	.000	-.119
Household Asset Score	-.015	-.494
Share of Non-farm Income	-.007	-6.249***
New Crop Growers (Sunflower)	-.242	-1.754**
Operating Land	.009	1.713**
Number of Crops (Rabi Season)	-.035	-.867
Number of Crops (Kharif Season)	-.065	-1.018
Cropped Area (Rabi Season)	-.005	-.410
Cropped Area (Kharif Season)	-.007	-.758
Intercept	1.660	3.948***
Adjusted R^2	0.607	
F-Value (Significance)	21.09***	
Condition Index	27.71	
Number of Observations	222	
* Significant at 10 % level, ** Significant at 5% level, *** Significant at 1% Level		

As the average real income has declined over the period of study (1988-2005), the sign of coefficients should be interpreted carefully. A negative sign of the base year income is indicating a significant downward mobility. It shows that the decline in household income is higher for households that were poorer to start with. Similar is the case of larger family size in the base year. A decline in real income is associated with the higher dependency ratio and land ownership in the base period. A change in operation land is

also positively associated with the change in real income. The findings are not surprising due to problems of severe water shortage and drought in the area, as discussed above. On the other hand, change in nonfarm income share and crop diversification (new crop growers) has significant negative coefficients indicating the prospects of positive income change. Other crop related variables (change in number and area of crops) although have negative sing but are not significant.

Table 6.2 displays logit estimates of poverty status[26] for both periods. The significant positive determinant of poverty for the base (1988) period include: family size, ratio of dependents to non-dependents and household with larger share of agriculture wages in household income, while negative correlates are female primary enrollment, land ownership and household assets. The impact of child education on household poverty status is more pronounced in the logit estimates for 2005. Female primary and secondary and male secondary enrollments are negatively associated with poverty. The coefficients for share of non-farm income, although not statistically significant, are negatively correlated with the poverty for both periods.

TABLE – 6.2 DETERMINANTS OF POVERTY STATUS – LOGIT ESTIMATES				
	1988		**2005**	
Explanatory Variables	**Coefficients**	**Significance**	**Coefficients**	**Significance**
Family Size	0.10	0.05*	.068	.100*
Dependency Ratio	2.76	0.01*	.034	.974
Age of Head of Household	0.01	0.67	.014	.213
Head Education (Primary)	0.26	0.59	.812	.091*
Head Education (Above primary)	-1.32	0.12	.124	.824
Head Occupation (Agriculture)	0.60	0.30	.371	.341
Primary Enrollment – Male	0.01	0.12	.010	.021*
Primary Enrollment – Female	-0.02	0.09*	-.009	.076*
Secondary Enrollment – Male	0.00	0.68	-.007	.099*
Secondary Enrollment – Female	-0.02	0.50	-.002	.689
Land Ownership	-0.05	0.00*	-.021	.015*
Household Asset Score	-0.29	0.09*	-.506	.000*
Non-farm Income Share	-0.01	0.21	-.003	.477
Share from Agriculture Wages	0.09	0.02*	.040	.201
Share from Dairy Sale	0.02	0.14	-.001	.956
Sugarcane Growers (dummy=1)	-1.81	0.00*	-.833	.047*
'Taulka' BADIN (dummy=1)	0.96	0.01*	-.639	.089*
Intercept	-2.20	0.05*	1.449	.077*
Pseudo-R^2	0.485		0.349	
Predicted Correct Percentage	78.8		75.2	
Number of Observations	222 (Poor=110)		222 (Poor=149)	
* Significant at least at 10% level.				

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[26] poor=1 and non-poor=0

The results of sequential logit models are presented in Table 6.3. The probabilities of being poor in both periods are reflected in the first column of the table. Although, barring education of head of household, signs of the coefficients are according to a priori expectation, very few variables turned out statistically significant. This may be perhaps due to small number of observations. Similar is the case for probabilities for falling into poverty (not poor in the base period). A change in the share of non-farm income is negative and highly significant indicating the importance of the variable for the descending households.[27]

TABLE – 6.3 DETERMINANTS OF POVERTY STATUS IN 2005 [Conditional upon Poverty Status in 1988]				
Explanatory Variables	**Being Poor in 1988**		**Being Not Poor in 1988**	
	Coefficients	**Significance**	**Coefficients**	**Significance**
Family Size	.133	.309	.093	.210
Dependency Ratio	-1.030	.156	.244	.686
Age of Head of Household	.009	.652	.043	.050*
Head Education (Primary)	.265	.712	1.794	.062*
Head Education (Above primary)	-.283	.811	.503	.551
Head Occupation (Agriculture)	.726	.375	.876	.224
Primary Enrollment – Male	.011	.217	.012	.069*
Primary Enrollment – Female	-.013	.141	-.007	.407
Secondary Enrollment – Male	-.011	.149	-.003	.657
Secondary Enrollment – Female	-.006	.505	.000	.988
Land Ownership	-.051	.262	-.022	.133
Household Asset Score	-.844	.015*	-.774	.009*
Non-farm Income Share	-.007	.551	.000	.993
Share from Agriculture Wages	.035	.367	.058	.303
Share from Dairy Sale	.063	.259	-.031	.069*
Sugarcane Grower (dummy=1)	-1.595	.084*	-.131	.850
'Taluka' BADIN (dummy=1)	-.075	.917	-1.529	.032*
Change Variables: 1988-2005				
Family Size	.135	.163	-.134	.161
Dependency Ratio	.648	.078*	-.145	.720
Owned Land	-.114	.182	.015	.386
Household Asset Score	.461	.135	.168	.499
Share of Non-farm Income	.006	.481	-.022	.061*
New Crop Growers (Sunflower)	-1.523	.067*	-.678	.472
Intercept	3.656	.012*	.610	.715
Pseudo-R^2	0.512		0.502	
Predicted Correct Percentage	79.1		80.4	
Number of Observations	110		112	
* Significant at least at 10% level.				

[27] See also the results related to share of non-farm income in Table 6.4 and also in the appendix, Table A2.

More or less similar patterns are observed in Table 6.4, which reports the estimates of multinomial logit model. According to the table, the major determinants of chronic poverty include; a lack of crop diversification, larger family size, low level of land ownership and household assets, while household may avoid descent by lowering dependency ratio, increasing the primary and secondary enrollments, raising the level of land ownership and by increasing the non-farm income opportunities.

Explanatory Variables	Descending [72 Households]		Chronic [77 Observation]	
	Coefficients	Significance	Coefficients	Significance

TABLE – 6.4
FACTORS INFLUENCING DESCENT AND CHRONIC POVERTY – ESTIMATES OF MULTINOMIAL LOGIT
[Reference Category: Not Poor in 2005]
(Never Poor Plus Ascending – 73 Households)

Explanatory Variables	Descending [72 Households] Coefficients	Descending [72 Households] Significance	Chronic [77 Observation] Coefficients	Chronic [77 Observation] Significance
Family Size	.038	.525	.118	.063*
Dependency Ratio	-.342	.391	-.096	.829
Age of Head of Household	.023	.099*	.012	.392
Head Education (Primary)	.908	.112	.873	.121
Head Education (Above primary)	.525	.428	.189	.797
Head Occupation (Agriculture)	.512	.294	.699	.177
Primary Enrollment – Male	.013	.009*	.009	.099*
Primary Enrollment – Female	-.010	.102*	-.009	.183
Secondary Enrollment – Male	-.005	.290	-.004	.422
Secondary Enrollment – Female	-.001	.852	-.002	.812
Land Ownership	-.001	.906	-.077	.003*
Household Asset Score	-.614	.002*	-.710	.002*
Non-farm Income Share	.006	.432	-.009	.253
Share from Agriculture Wages	.049	.162	.041	.260
Share from Dairy Sale	-.006	.637	.006	.658
Sugarcane Grower (dummy=1)	.193	.711	-2.198	.001*
'Taulka' BADIN (dummy=1)	-1.331	.004*	-.463	.346
Change Variables: 1988-2005				
Family Size	.044	.484	-.063	.343
Dependency Ratio	.199	.433	-.050	.852
Owned Land	-.012	.352	.002	.930
Household Asset Score	.176	.301	.275	.168
Share of Nonfarm Income	-.018	.012*	.010	.147
New Crop Growers (Sunflower)	-.658	.237	-1.081	.067*
Intercept	786	.454	1.477	.177
Pseudo-R^2	0.509			
Likelihood Ratio Test (Chi-Square)	133.60*			
Number of Observations	222			
* Significant at least at 10% level.				

7.   CONCLUDING REMARKS

The study region (Badin, district of the Sindh province) which is analyzed above is the poorest in the province with a very high rate of poverty incidence in the base period. More than 50 percent households were below the poverty line. The analysis shows that poverty in the area is not only persistent but also increasing over the years. On the basis of filed observations and focus group discussion during the re-survey, the following observations are made regarding the high incidence and persistence of poverty in the sample district.

A Lack of Physical Infrastructure: Overall, there was not a significant improvement in physical infrastructure, like paved roads, provision of electricity or the public drainage system during the two periods in the study villages. According to views expressed by the sample households, household income was adversely affected due to poor quality and no improvement in some of these services. In the majority of the villages, the link between village and a main road remained unpaved. Even for distance less than five kilometers, it takes more than an hour to travel. This poor condition also affected adversely on the availability of private transport in these villages. Electricity is not yet provided in most of the sample villages. The development and working of small scale industry, was therefore, badly affected. The most common small business in the study area are flourmills and rice mills due to dominant crops in the study sample.

A Lack of Agriculture Extension: In the sample of 28 villages, there was only one village, where few households reported receiving of agricultural extension services for some crops. According to respondents, it is difficult to know new varieties, quality of seed required, and proper dose of fertilizer applied and average yield from different crops in the absence of any guidance by the department of agriculture extension.

Shocks: During the period of two surveys, the study area witnessed some major shocks to the local economy. These were reported as; a) hailstorm in 1997, cyclone in 1999, heavy rains in 2003-4, and drought from 1999 to 2004. Majority of the villages were affected by these shocks.

Low Paid and Seasonal Non-farm Income: The survey results show that there was a considerable shift in the sources of income. The share of non-farm income increased nearly 40 percent from 30 percent. However, quite surprisingly, it was not enough to take households out of the poverty trap. One explanation for this could be the nature of non-farm activities in the study area. Except few observations, the majority of the households were involved either in casual labor or that business which did not appear high economic return. There was no improvement in real wages, measured in kilograms of wheat purchased from a days work. Possible causes are: low level of literacy among the adult members of households, seasonal nature of work in the study area and excess of labor supply.

The statistical and econometric analysis conducted above suggests that education, especially female education, non-farm income opportunities and crop diversification are

the major drivers for escaping poverty. In deprived rural areas, where agriculture activities are affected due to shortage of water and drought, non-farm income opportunities should be promoted by providing necessary infrastructure, skill development and formal educational institutions and by extending agriculture extension services. These are important steps towards poverty reduction.

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APPENDIX

TABLE – A1.1 AVERAGE VALUES OF VARIABLES – [1988 AND 2005] (According to Poverty Status – Table 5.4)				
Variables	**Ascending Households**		**Descending Households**	
	1988	**2005**	**1988**	**2005**
Monthly Income Per AEU (Nominal)	158.61	1580.03	441.55	376.33
Family Size	9.88	8.94	8.81	10.39
Dependency Ratio	1.51	0.88	1.04	1.06
Age of Head of Household	46.06	51.67	42.93	54.39
Head Education (Primary)	0.24	0.18	0.14	0.17
Head Education (Above primary)	0.03	0.12	0.10	0.11
Head Occupation (Agriculture)	0.88	0.64	0.83	0.69
Head Occupation (Non-Agriculture)	0.21	0.18	0.21	0.15
Primary Enrollment – Male	37.37	21.21	16.67	37.27
Primary Enrollment – Female	5.05	22.73	5.56	11.81
Secondary Enrollment – Male	18.18	34.85	13.89	28.33
Secondary Enrollment – Female	0.00	19.70	2.78	12.27
Owned Land	7.35	8.35	15.66	13.79
Household Asset Score	3.15	3.67	3.22	2.82
Non-farm Income Share	30.85	35.81	36.34	29.16
Share from Agriculture Wages	5.84	0.29	2.35	2.59
Share from Dairy Sale	7.22	1.49	4.64	4.81
Income from Crops – Share	45.00	43.49	42.88	613.40
Operating Land	7.74	5.43	11.61	5.82
Number of Crops (Rabi Season)	0.67	1.48	1.13	1.29
Number of Crops (Kharif Season)	1.55	1.03	1.50	0.85
Cropped Area (Rabi Season)	1.92	3.95	3.83	3.35
Cropped Area (Kharif Season)	7.33	4.86	10.69	2.94
Wheat Growers	0.12	0.06	0.17	0.14
Rice Growers	0.64	0.52	0.61	0.50
Sugarcane Growers	0.21	0.21	0.22	0.22
Sunflower Growers	----	0.27	----	0.21

Table – A1.2 Average Values of Variables – [1988 and 2005] (According to Poverty Status – Table 5.4)				
Variables	**Never Poor**		**Chronic Poor**	
	1988	**2005**	**1988**	**2005**
Monthly Income Per AEU (Nominal)	650.07	2201.89	130.59	342.72
Family Size	9.20	11.10	9.12	9.52
Dependency Ratio	1.06	1.02	1.32	0.85
Age of Head of Household	43.60	49.50	40.40	52.45
Head Education (Primary)	0.23	0.08	0.19	0.22
Head Education (Above primary)	0.13	0.30	0.03	0.08
Head Occupation (Agriculture)	0.80	0.55	0.92	0.70
Head Occupation (Non-Agriculture)	0.20	0.23	0.10	0.21
Primary Enrollment – Male	30.00	24.58	17.32	26.19
Primary Enrollment – Female	12.50	19.50	1.30	13.64
Secondary Enrollment – Male	19.17	47.08	9.74	20.13
Secondary Enrollment – Female	7.50	11.67	0.43	10.39
Owned Land	30.06	25.77	4.18	3.41
Household Asset Score	4.05	4.13	2.68	2.31
Non-farm Income Share	22.53	34.45	25.27	46.88
Share from Agriculture Wages	1.09	0.85	9.84	2.74
Share from Dairy Sale	2.63	6.59	9.23	7.97
Income from Crops – Share	38.67	17.40	46.24	36.72
Operating Land	10.18	4.86	10.84	4.93
Number of Crops (Rabi Season)	0.95	1.85	0.84	1.29
Number of Crops (Kharif Season)	1.48	1.25	1.47	0.90
Cropped Area (Rabi Season)	3.08	3.48	2.49	2.92
Cropped Area (Kharif Season)	8.13	3.07	8.48	2.87
Wheat Growers	0.08	0.08	0.18	0.16
Rice Growers	0.48	0.30	0.83	0.49
Sugarcane Growers	0.28	0.28	0.06	0.06
Sunflower Growers	----	0.18	----	0.16

TABLE – A2 MEAN VALUE OF CHANGE IN IMPORTANT VARIABLES – [1988-2005] (Ascending versus Descending Households)				
Variables	**Mean** **Δ (Value 2005-Value 1988)**		**t - Value**	**Significance**
	Ascending **Households**	**Descending** **Households**		
Family Size	.4516	1.6769	-.868	.390
Dependency Ratio	-.5642	.1410	-2.377	.021*
Primary Enrollment – Male	20.4301	37.6923	-1.857	.068*
Primary Enrollment – Female	17.7419	13.0769	.592	.556
Secondary Enrollment – Male	37.6344	31.3846	.607	.547
Secondary Enrollment – Female	19.3548	11.0256	1.077	.287
Owned Land	1.5968	-2.3223	1.264	.209
Household Asset Score	.6452	-.3846	2.418	.020*
Share of Non-farm Income	2.0688	-2.1046	.553	.582
Operating Land	-1.8468	-6.3600	2.050	.043*
Number of Crops (Rabi Season)	.7419	.2462	2.019	.047*
Number of Crops (Kharif Season)	-.3548	-.5538	1.340	.184
Cropped Area (Rabi Season)	.3952	-.8231	1.296	.200
Cropped Area (Kharif Season)	-1.1048	-5.1192	2.522	.013*
* Significant at least at 10% level.				