Journal of Economics and Sustainable Development
ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online)
Vol.3, No.8, 2012

Impact of Housing Environment on Poverty

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Abstract

Poverty has several dimensions and multi formation.Usually it is defined by focusing narrowly on income poverty or broadly by including lack of access to opportunities for raising standards of living. Strategies aimed at poverty reduction need to identify factors that are strongly associated with poverty and agreeable to modification by policy. This study uses integrated Household Survey (2009-10) data collected by Federal Bureau of Statistics to examine plausible determinants of poverty status, employing Bivariate models. In general, this study strives to hunt for the household environmental and public utilities factors for poverty status that account for poverty differentials in Pakistan. This study indicates that ownership of assets is a key determinant of poverty. Population occupying a house with more rooms, having better sewerage system, Piped water and toilet type are mostly belonging to the class which is non-poor. Moreover, transitory poor class having defined variables have more probability to come out of poverty line defined. Policy makers might target transitory poor class first to break the vicious circle by providing them better household environments.

Keywords; Poverty Status, Transitory poor, Extreme poor, Public utilities.

1. Introduction

Poverty is being deficient in any absolute definition, at any given time it can be measured as a shortfall in a minimum level of income needed to provide a respectable living standard including food, clothing, and affordable housing. It refers to either lack of command over commodities in general or inability to obtain a specific type of consumption (food, clothing, housing etc.) deemed essential to constitute a reasonable standard of living in a society. Living standard is not determined by income and consumption alone, but non-economic aspects such as life expectancy, mortality, access to clean drinking water, education, health, sanitation, electricity and security are also important measures of well being. Critical variables that contribute to improve living standards are health facilities, drinking water, sanitation facilities, and availability of public utilities etc.

In developing countries nutrition and health is common problem which get severity in case of poverty. This situation provokes a vicious circle of low productivity, low wages, malnutrition, ill-health and low working capacity. The interaction between poor health and working conditions and poverty determines a distinctive morbidity-mortality pattern among poor community, which is due to the combination of malnutrition.

The eradication of poverty has been a subject of debate in world for decades, yet it was in recent years that seriousness of the situation was realized globally and specific efforts were taken in this direction. In the same way reducing poverty has the remained main objective of the policy makers in Pakistan. The living conditions of Pakistan's poor and poverty alleviation have gained more importance since the adoption of Millennium Development goals (MDGs).

The existing work on poverty in Pakistan reveals that a large number of efforts have been made to estimate the extent of poverty in Pakistan during the last two decades. However, this study is not concerned with the measurement of poverty rather this focuses on the dynamics and determinants of poverty which categorize the entire population into different classes/bands like non-poor, transitory poor and extremely poor. It employs Bivariate logit models using Pakistan Household Integrated Survey (2009-10) conducted by Federal Bureau of Statistics Pakistan to identify the factors seems to be responsible to segregate people into certain class of poverty. We opted housing environment variable to classify the population into, non-poor, transitory poor and extreme poor bands which strongly affect the household or individual's likelihood of entering or exiting poverty status.Overall, this study aims to examine the impact of key factors related to population and household environment that account for poverty differentials in

Pakistan.

2. Review of Literature

The review of different studies in which poverty nexus is explored with different perspectives is presented in this section. In general, these studies have used different methodologies, including ordinary least squares regression where the dependent variable is continuous, logistic regression where the dependent variable is binary and quantile regression where the dependent variable is income.

The phenomenon of poverty using logit model based on a village survey was discussed by Azid and Malik (2000). The study finds that the credit and medical facility have negative effect on poverty. The usage of electricity and ratio of female workers to male workers in a household has negative impact on poverty. It confirms the hypothesis that the higher the female participation, the higher the total income and lower the risk of poverty. Education has also negative effect on the poverty; it implies that the more educated persons have more potential to exploit the resources and technology. The demographic variable age of head of household produces a few surprises. The coefficient of age is not significant and suggests that in a rural society instead of age the economic opportunities have the significant role in the growth of the income of household, there is negative relationship between the size of household and poverty.

Nazli and Malik (2003) analyze the housing condition using Housing Poverty Index and applying this indicator to Pakistan show that 61% households were poor according to PIHS data for 1998-99.This proportion was 19%in urban areas and 84% in rural areas. Among the 19% urban household, 26% don't have electricity and piped water and more than 92% don't have the gas and telephone connection. No toilet facility is available to 36% urban households. Proper sewerage system was available to only 37% households. This means that these 19% of urban household are chronically housing poor. They are living in extremely unhygienic conditions and for the rural areas this proportion of most insecure and vulnerable household is 84%.

There is considerable evidence of a strong negative correlation between household size and consumption (or income) per person in developing countries. The poor devote a high share of their income to goods such as food, tap water, cooking utensils, firewood and housing etc. Ravallion and Lanjouw (1995) test the robustness of the relationship between poverty and household size using Pakistan Integrated Household Survey (PIHS) and results confirm the negative relationship between household size and poverty, as the size of household increases the probability of being poor will increase.

Fissuh and Harris (2005) use micro level data from Eritrea Household Income and Expenditure Survey 1996-97 to examine the determinants of poverty in Eritrea. The DOGEV is an attractive model from the class of discrete choice models for modeling determinants of poverty across poverty categories (absolute poor, moderate poor). Household size defined by adult equivalent units has a significant negative effect on the welfare status of a household. The size of the effect of household size on poverty is not the same across the categories. Age of household head was not found to be significant in linear terms in all poverty outcomes. However, the coefficient of age squared was found to be negative and significant in the moderate poor category only. Even though education is negatively correlated with poverty, basic education does not suffice. This indicates that education is not sufficient condition to escape from poverty but there are other factors, which affect poverty of a household in conjunction with education. The coefficient of schooling is higher (absolute terms) in the absolute poor category than in the other categories.The probability of a household being non-poor is a concave function of the number of employed persons per household. Besides, regional unemployment rate was found to be positively associated with poverty. These results suggest labor market policies as potential instruments for tackling poverty in Eritrea. The coefficient of sewage variable, which is employed as a proxy for health condition of a household, is found to be negative and significant. Access to sewage facilities is very vital for well being of a household. Results shows that lack of sanitation facilities have negative well being effect via bad health, reduced school attendance, gender and social exclusion and income effect (reducing productivity).

Impact of household size and its positive relation for entering or escaping poverty in Peru was analyzed by Herrera (2000). The number of income earners also plays a role but only in chronic poverty, while household composition

has an independent impact. It is interesting to note that the proportion of children aged over six has a reverse strong positive effect in escaping poverty relative to staying in poverty. This may be related to increased participation in the labor market of female household members. Though male-headed households have better odds of escaping poverty or never being touched by poverty as well as lower chance of falling in poverty, but this effect was not statistically significant. Concerning education variables, if the household head has no formal education level the household chances of being always poor relative to never being poor is high. Households, which did not possess assets, appeared to have a greater probability of living in poverty than those that did.

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The DOGEV is an attractive model from the class of discrete choice models for modeling determinants of poverty across poverty categories (absolute poor, moderate poor) which was applied by Fissuh and Harris (2005) for micro level data from Eritrea Household Income and Expenditure Survey 1996-97 to examine the determinants of poverty in Eritrea. Household size defined by adult equivalent units has a significant negative effect on the welfare status of a household. The size of the effect of household size on poverty is not the same across the categories. Age of household head was not found to be significant in linear terms in all poverty outcomes. However, the coefficient of age squared was found to be negative and significant in the moderate poor category only.The probability of a household being non-poor is a concave function of the number of employed persons per household. Besides, regional unemployment rate was found to be positively associated with poverty.

The determinants of poverty in Uganda by using logistic regression model was examined by Adebua, et al (2002).This study shows that household with better educated heads are less likely to be poor and large households are more likely to be poor. This confirms that the larger the household size, the poorer the household is.

The studies reviewed above has analyzed the different determinants of poverty applying different methodologies A review of the existing work on poverty shows that a large number of attempts have been made to estimate the incidence of poverty all over the world during the last two decades. However, in this study we focused on the dynamics and determinants of poverty which categorize the entire population into different classes/bands like non-poor, transitory poor and extremely poor, we are interested to estimate the impact of housing environments on the different bands of poor; this is novelty of the study.

3. Plan of Study

Modeling poverty is an art which changes shape but having same connotation. There are basically two approaches in modeling determinants of poverty.[2] The first approach[3] is based on the regression of consumption expenditure per adult equivalent against potential explanatory variables.

The second approach is to model poverty by employing a discrete choice model. The practice of discrete choice models in the analysis of determinants of poverty has been popular approach. The discrete choice model has a number of attractive features in comparison to the regression approach. The regression approach unlike the discrete choice models does not give probabilistic estimates for the classification of the sample into different poverty categories. so in that case we cannot make probability statements about the effect of the variables on the poverty status of our economic agents.

[2] See Harris and Fissuh (2005)
[3] This approach works by regressing consumption expenditure (in log terms) on the household, community and common characteristics which are supposed to determine household welfare, for example Glewwe (1990), Muller (1999) and Canagarajah and Portner (2003). This approach rests on a heroic assumption that higher expenditure implies higher utility and vice versa.

The discrete choice analysis proceeds by employing Binary logit or probit model to estimate the probability of a household being poor conditional upon some characteristics. In some cases the households are divided into more than two categories and then employ multinomial logit model or ordered logit model is used to identify the factors which affect the probability a household being poor conditional upon a set of characteristics. The approach we will follow intends to investigate the determinants affecting the probability of being non-poor, transitory poor or extreme poor. In this study we will use the Bivariate logit model.

3.1.1 Bivariate Logit Model

We assumed that the probability of being in a particular poverty category is determined by an underlying response variable that captures the true economic status of an individual. In the case of a binary poverty status (i.e., being poor or non-poor), let the underlying response variable Y^* be defined by the regression relationship.

$$y_i^* = \sum X_i' \beta' + u_i \qquad \text{..... (1)}$$

Where $\beta' = [\beta_1, \beta_2, ..., \beta_k]$ and $X_i' = [1, X_{i2}, X_{i3}, ..., X_{ik}]$

In equation (1) Y^* is a latent variable and defined as

Y =1 if y* >0 and

Y= 0 otherwise ..... (2)

From equation (1) and equation (2) we can derive the following expressions.

$$\Pr ob(y_i = 1) = \Pr ob\left(u_i > -\sum x_i \beta\right)$$

$$= 1 - F\left(-\sum x_i \beta\right) \qquad \text{..... (3)}$$

Where F is the cumulative distribution function for u_i and

$$\Pr ob\left(y_i = 0\right) = F\left(-\sum x_i \beta\right)$$

The likelihood function can be given by,

$$L = \prod_{y_i=0} \left[F\left(-\sum X_i' \beta\right)\right] \prod_{y_i=1} \left[1 - F\left(-\sum X_i' \beta\right)\right] \qquad \text{..... (4a)}$$

This can be written as

$$L = \prod_{y_i=1} \left[F\left(-\sum X_i' \beta\right)\right]^{1-y_i} \left[1 - F\left(-\sum X_i' \beta\right)\right]^{y_i} \qquad \text{..... (4b)}$$

The functional form imposed on F in equation (4) depends on the assumption made about u_i in equation (1). The cumulative normal and logistic distributions are very close to each other. Thus using one or other will basically lead to some results (Maddala1983).

We have specified the logit model for this study by assuming a logistic cumulative distribution of u_i in F (in equation (4a) and (4b)). The relevant logistic expressions are,

$$1 - F\left(-\sum X_i'\beta\right) = \frac{e^{\sum X_i'\beta}}{1+e^{\sum X_i'\beta}} \quad \text{..... (5a)}$$

$$F\left(-\sum X_i'\beta\right) = \frac{1}{1+e^{\sum X_i'\beta}} \quad \text{.....(5b)}$$

X_i are the characteristics of the households/individuals and β_i the coefficients for the respective variable in the logit regression.Having estimated equation (4) with Maximum Likelihood (ML) technique equation (5a) basically gives us the probability of being poor (prob (Yi=1)) and equation (5b) the probability of being non-poor (prob (X_i =0))

3.1.2 Ordered logit Model

Assuming three poverty categories (1, 2 and 3 and associated probabilities P1, P2 and P3), an individual would fall in category 3 if $u < \beta' x$, in category 2 if $\beta' x < u < \beta' x + \alpha$ and in category 1 if $u > \beta' x + \alpha$ where $\alpha > 0$ and *u* is the error term in the underlining response model (see Equation 1). These relationships may be given by.

$$P_3 = F(\hat{a}x_i')$$

$$P_2 = F(\hat{a}x_i' + \alpha) - F(\hat{a}x_i') \quad \text{.....(6)}$$

$$P_1 = 1 - F(\hat{a}x_i' + \alpha)$$

Where the distribution F is logistic in the ordered logit model. This can easily be generalized for *m* categories (see Maddala 1983). Assuming the underlying response model is given by

$$y_i = \hat{a}x_i' + u_i \quad \text{..... (7)}$$

We can define a set of ordinal variables as:

$Z_{ij} = 1$ If y_i falls in the jth category

$Z_{ij} = 0$ Otherwise (i=1, 2,…., n; j=1,2,…,m)

$$prob(Z_{ij} = 1) = \Phi(\alpha_j - \beta' x_i) - \Phi(\alpha_{j-1} - \beta' x_i) \quad \text{.... (8)}$$

Where Φ is the cumulative logistic distribution and the $\alpha_j's$ are the equivalents of the αs in equation (6). The likelihood and log-likelihood functions for the model can be given by equations (9) and (10) respectively, as:

$$L = \prod_{i=1}^{n}\prod_{j=1}^{m}[\Phi(\alpha_j - \beta' x_i) - \Phi(\alpha_{j-1} - \beta' x_i)]^{Z_{ij}} \quad \text{..... (9)}$$

$$L^* = \log L = \sum_{i=1}^{n}\sum_{j=1}^{k} Z_{ij} \log \Phi[(\alpha_j - \beta' x_i) - \Phi(\alpha_{j-1} - \beta' x_i)] \quad \text{..... (10)}$$

Equation (10) can be maximized in the usual way, and can be solved iteratively by numerical methods, to yield maximum likelihood estimates of the model (see Maddala 1983).

3.1.3 Data Sources

The analysis in this study is based on micro data taken from the Pakistan Integrated Household Survey (PIHS 2009-10) Household Integrated Survey (HIES 2009-10). These household surveys is conducted by the Federal Bureau of Statistics provide comprehensive information about household consumption expenditure, income and different socio-economic indicators that are essential for poverty analysis. The sample size of these household surveys is substantial enough to allow representative estimates. The total sample considered here comprises of 15000 households.

3.1.2 Construction of Variables

This study uses consumption as a welfare and poverty status indicator instead of Income because consumption measures welfare achievement and exhibit less seasonal variability moreover people willingly mention their consumption pattern rather than income. This study defines poor as population living on less than $1.25 a day at 2005 international purchasing power parity prices. That is 1.25US dollar per day= Rs 3375 per capita per month is required to get out of poverty line. The headcount ratio, i.e. proportion of poor households among total households is used as a measure of poverty. We categorized dependent variable into three mutually exclusive categories. We assume that a typical household belongs to one of three mutually exclusive categories.

Table 1
Definition of Dependent Variable

Variable	Definition
Dependent variable *1-Extremely poor* *2-Transitory poor* *3-Non-poor*	1. Extremely poor households are that whose per capita per month expenditure are less than 0.5 of poverty line. 2-Transitory poor households are those who's per capita per month expenditure lies between the "0.75 of line. 3-Non-poor households are that whose per capita per month expenditure is above the poverty line.

Table 2
Definition of Explanatory Variables

Variable	Definition
Explanatory Variable	
Public utilities variables	To see what is the link of public utilities with different categories of poor, we take electricity, gas and telephone.
Electricity	HH_E = 1, if household has electricity connection. =0, otherwise.
Telephone	HH_T = 1, if household has Telephone connection= 0, otherwise
Gas connection	HH_G = 1, if household has gas connection =0, otherwise.
Housing characteristics	To see what the impact of housing condition is, we take number of rooms and occupancy status of households.
Number of rooms	RM_2 =1, if a household has two rooms. =0, otherwise RM_3 =1, if a household has three rooms =0, otherwise. RM_4 =1, if a household has four rooms =0, otherwise RM_5 =1, if a household has five or more than five room =0, otherwise. The base category for these variables will be one room in the household.
Occupancy status	HH_OCC1 = 1, if household head is owner of the house.=0, otherwise.
Source of drinking water	HH_WS1 = 1, if house hold has "piped, "water source.= 0, otherwise. HH_WS2 = 1, if household has "hand pump" water source. = 0, otherwise. HH_WS3 = 1, if household has "motorized pumping" = 0, otherwise The base category for these variables will be "traditional" water source like canal, well or spring water sources.
Toilet type	HH_TT1 = 1, if household has flush connected to public sewerage =0, otherwise HH_TT2= 1, if household has flush connected to open drain =0, otherwise. The base category for these variables will be no toilet in the household.
Drainage and sewerage	HH_DS1= 1, if household has underground drainage and sewerage system = 0, otherwise HH_DS2= 1, if household has open drainage and sewerage system =0, otherwise. The base category for these variables will be no drainage and sewerage system in the household.

4. Empirical Findings

4.1 Bivariate Logit Model-

In this model the dependent variable is categorized as poor and non-poor and the model is estimated by using Maximum Likelihood technique. Result in Table 3 is for Bivariate logit model where poverty is dependent variable.

Table 3
Dependent Variable is Poverty

Variable	Marginal Effects	
Public Utilities Variables		
Electricity connection	-0.1578*	(0.00)
Gas connection	-0.1309*	(0.00)
Telephone connection	-0.2517*	(0.00)
Housing Characteristics Variables		
Occupancy status of house	-0.2496*	(0.00)
Having two rooms in house	-0.0748*	(0.00)
Having three rooms in house	-0.1116*	(0.00)
Having four rooms in house	-0.1330*	(0.00)
Having five or more rooms in house	-0.1878*	(0.00)
Piped water source	-0.0315*	(0.00)
Hand pump source	0.0954*	(0.00)
Motorized pumping source	-0.0683*	(0.01)
Flush connected to public sewerage	-0.1182*	(0.00)
Flush connected to open drainage	-0.0463*	(0.00)
Underground drainage & sewerage system	-0.0410*	(0.00)
Open drainage sewerage & system	0.0809	(0.22)
Log likelihood	--1150.7113	

The Table-3-statistics reveal the household environmental variables, which consist of housing characteristics and public utilities. This indicates that these variables are the important determinants of poverty.

The **public services variables** in the model seems credible since the coefficients of the dummy variables representing electricity connection (HHE), gas connection (HHG) and telephone connection (HHT) are statistically significant at 1% level of significance. The estimated coefficients of these variables state that it is 15%, 13% and 25% less likely that the household lies in the poor category as compared to those households that have no electricity, gas and telephone connection. The estimated coefficients of dummies that show **number of rooms in a household** are also statistically significant at 1% level of significance. Furthermore the estimated coefficients of these variables indicate the increase in the probability of lying in the non-poor category due to having a larger number of rooms. Thus for example a household in which there are two rooms, the probability of being non-poor category is 7% higher than in the household in which there is one room. The increase in the probability goes to 11%, 13% and 18% in the households that have three, four and five or greater than five rooms respectively. This indicate as the number of rooms increase the household environmental status also improve which reduce the health hazards and a healthy person is more productive asset as compared to unhealthy person. In this way he can pay more attention and time to work or income and fight against the poverty status and improve his living condition.

The coefficient for **house ownership** dummy is significant at 1% level of significance. This states that it is 25% more probable that household fall in non-poor category as compared to those household that are not the owners of their houses. This is in line with economic theory. Ownership of asset is really an important indicator of poverty in most developing countries. This indicator is of a paramount importance because it is also household wealth, which generates income flows.

The **toilet types**, **drainage and sewerage** variables are also statistically significant except the variable "Household has open drainage and sewerage system" which is statistically insignificant. The estimated coefficient of the variables "Household has flush connected to public sewerage (HH_TT1)" and "Household has flush connected to open drain (HH_TT2)" state that there is 12% and 4% respectively more chance that household moves from poor to non poor category as compared to those households with no toilet facility. On the other hand the variable, "household has underground drainage and sewerage system" states that it is 4% more likely that households fall in non- poor category, as compared to those households, which have no drainage and sewerage system. However the variable that "household has open drainage and sewerage system" has no statistically significant impact on poverty status of households. This also vindicates the findings that public sewerage system is more a sound determinants of poverty. This means that access to sewerage system is very vital for the well being of a household. Lacks of sanitation facilities have negative effect via bad health, reduced school attendance, gender and social exclusion and income effect (reduction in productivity).

All the variables for "**sources of water**" in household are statistically significant at 1% level of significance. The estimated coefficients of "piped water" and "motorized pumping" show that it is 7% more likely that a household belongs to non-poor category as compared to those households which have "traditional" water sources like spring, canal and well. While the estimated coefficient of "hand pump" water source indicates that it is 9% more probable that household lies in poor category. This means that "piped water" is an important determinant of poverty status.

4.2 Ordered Poverty Status

We have ordered the sample into three mutually exclusive categories: non-poor (category0), transitory poor (category1) and extremely poor (category2), with household in category 2 being most affected by poverty. The estimated coefficients and marginal effects are given in Table-4.

In general, it is interesting to note that those factors that are important in the bivariate model are still important in the ordered logit model. More importantly, results show clearly the dynamics of poverty on different categories.

Our result statistics depicts that having **electricity connection** in the household increases the probability of being non-poor as compared to those households which have no electricity connection by 7 % and 5% in transitory poor and extremely poor categories respectively. This is also true in the case of gas and telephone connection. As the estimated coefficient shows that that having **gas and telephone connection** in the household raises the probability of being non poor by 13%, 22% and 11%, 13% in transitory poor and extremely poor group respectively.

Table-4

Results of Ordered logit model where poverty as dependent Variable.

Public Utilities Variables	Transitory Poor (Marginal Effects)	Extremely poor (Marginal Effects)
Electricity connection	0.0699*	0.0564*
Gas connection	-0.1259 *	-0.1079*
Telephone connection	-0.2172*	-0.1330*
Housing Characteristics Variables		
Occupancy status of house	-0.0681*	-0.0425*
Having two rooms in house	-0.0826*	-0.0531*
Having three rooms in house	-0.1101*	-0.0535*
Having four rooms in house	-0.1250*	-0.0566*
Having five or more rooms in house	-0.1625*	-0.0659*
Piped water source	-0.0604*	-0.0663*
Hand pump source	0.0414*	0.0133*
Motorized pumping source	-0.0398 **	-0.0261**
Flush connected to public sewerage	-0.1772*	-0.1337*
Flush connected to open drainage	-0.1206*	-0.1163*
Underground drainage & sewerage system	-0.0517*	-0.0302*
Open drainage sewerage & system	0.0082	0.0026
Log Likelihood	-9750.7113	
Probabilities of Critical Values are 1%, 5%, 10% are indicated significance by *, **, *** respectively		

The estimated coefficient of dummies for **number of rooms** in the house indicate that as the number of rooms increases the probability of household being non-poor also increase in different poverty categories. If there are two rooms in the house raises the probability of being non poor by 8% and 5% in transitory and extremely poor groups respectively. The probability of being non-poor increases by 11%, 12%16% and 5%, 6%, 7% if the household has three, four, five and more than five rooms in transitory poor and extremely poor category respectively.

The estimated coefficient of the **house ownership** variable also increases the probability of being non-poor by 7% and 4% in transitory poor and extremely poor categories respectively. This can be explained by the fact that ownership is a source of income. Secondly house ownership saves household owners from paying huge amount of rent which takes about two third of average income and hence enables them to spend it in non-house rent expenditures.

Results indicate that "household has underground **drainage & sewerage system**" is more important determinant of poverty as compared to "household has open drainage & sewerage system" which is statistically insignificant and has no significant impact on poverty status of households lying in different poverty categories. The estimated coefficient of "household has underground drainage and sewerage system" shows that there is 5% and 3% more likelihood to be non-poor in transitory poor and extremely poor categories respectively.

The **toilet types** used in the household also have significant impact on poverty status of households. As the results demonstrate that the variable "**Flush connected to public sewerage**" increases the probability of household being non- poor by 18% and 13% in transitory poor and extremely poor categories respectively. While the variable "Flush connected to open drainage" also raise the probability of non poor (which is quiet less than the other toilet type variable) by12% and11% in transitory poor and extremely poor categories respectively. Access to "sewerage and

drainage facilities" and "toilet type in a household" are very vital for the well being of a household. For example Lee Gravers (2001) identify that the lack of sanitation facilities have negative well being effect via bad health, reduced school attendance and income effect (reducing productivity).

The variables **water source** also shows significant impact on the poverty status of the household in different poverty categories. The variables "piped water source" and "motorized pumping" raise the probability of household to be non-poor as compared to those households which have "traditional" water source" by 6%, 6% and 3%, 3% in transitory poor and extremely poor groups respectively. While the variable "hand pump" water source indicates that it is 4% and 1% less likely to be non-poor households in transitory poor and extremely poor categories.

Conclusion

The main objective of this study is scrutinizing the housing environment status impact on the assorted classes of poverty defined.

In this study we found transitory poor categories have greater probability of coming out of poverty circle as compared to extreme poor category. The public utilities variables which are used in this study like electricity, gas and telephone connection indicates their significant role in bifurcation of poor classes.

This study indicates that ownership of house is a key determinant in defining poverty. This determinant has the largest marginal effect, implying that the probability of being poor decreases as the household asset ownership structure increases and this effect is more prominent in transitory poor category.

It is seen that as the number of rooms in a household increases the probability of moving from poor to non-poor category. In the same way" piped water" and "motorized pumping" water source have significant impact in effecting the household poverty status and this step is more effective in transitory poor category as compared to extreme poor." underground drainage and sewerage system" also plays a positive role in defining poverty status of the household.

Based on our results, the following policy implications are derived from this study which is expected to contribute to the poverty reduction strategy being pursued by Pakistan:

- Housing is a fundamental human need as it provides physical, economic and social security to the poor. Thus Government can make people more secure by providing facility of housing schemes.
- Improving the quality and delivery of public utilities has a positive effect on the well-being of people and helps them in driving out of the poverty trap.
- Government and civil society together can make an effective difference in the lives of the people by providing safe drinking water and basic drainage & sanitation. This will provide better opportunities for people due to time saved in fetching water and will facilitate in reducing water born diseases.

References

Adebua, A, F. N. Okurut and J. A. Odowee (2002), "*Determinants of regional poverty in Uganda*", Research Paper 122, African Economic Research Consortium, Nairobi.

Ahmed, A. U. and L. Haddad (2002), "*Avoiding chronic and transitory poverty: evidence from Egypt, 1997-99*", Discussion Paper No 133, International Food Policy Research Institute, Washington, D.C.

Akhtar, S. and M. Ahmed (2004), "Macro determinants of poverty: preliminary evidence from Pakistan", *Pakistan Business Review*, 3-20.

Amuedo-Dorantes, C. (2004), "Determinants of Poverty Implications of Informal Sector Work in Chile", *Economic Development and Cultural Change*, 347-368.

Azid, T. and S. Malik (2000), "Impact of village-specific, household-specific, and technological variables on poverty in Punjab", *The Pakistan Development Review*, 39(4): 793-806.

Benson, T. and S. Mukherjee (2003), "The determinants of poverty in Malawi, 1999", *World Development*, 31(2), 339-358.

Burkhauser, R, V. (2001), "What Policymakers Need to Know about Poverty Dynamics", *Journal of Policy Analysis and Management*, 20(4):757-759.

Ellwood, T, D. and M, J, Bane (1986), "Slipping into and out of Poverty: The Dynamics of Spells", *The Journal of Human Resources,* 21(1), 1-23.

Fofack, H. (2002), "*The dynamics of Poverty Determinants in Burkina Faso in the 1990s*", Policy Research Working Paper 2847, The World Bank Africa Technical Families.

Geda, A, N.D.Jong, G.Mwabu and M.S. Kimenyi (2001), "*Determinants of Poverty in Kenya: A household Level analysis*", Discussion Paper, Institute of Social Studies Hang and Kenya Institute for Public Policy research and Analysis.

Goaed, S. and M. Ghazouani (2001), "*The determinants of urban and rural poverty in Tunisia*", Discussion paper, Laboratoire d'Econométrie Appliquée (LEA), Faculté des Sciences Economiques et de Gestion de Tunis, Tunisia.

Greene, W.H. (2003), *Econometric Analysis*, 5th edition, Prince Hall, USA.

Harris, M. and E. Fissuh (2005), "*Modeling determinants of poverty in Eritrea: a new approach*", working Paper, Department of Econometrics and Business Statistics, Monash University, Australia.

Havinga, I. C., Haanappel, F.W. (1989), "Poverty in Pakistan 1984-85", *The Pakistan Development Review*, 28(4), 851-869.

Herrera, J. (2000), "*Poverty dynamics in Peru, 1997-1999*", Discussion Paper, World Bank at Rio De Janeiro, Brazil.

Kedir, A. and A. Mackay (2003), "*Chronic poverty in urban Ethiopia: panel data evidence*", Mimeo, School of Economics, university of Nottingham.

Kyerme, S. and E.Thorbecke (1991), "Factors Affecting poverty in Ghana", *Journal of Development Studies*, 28(1), 39-52.

Lancaster, G, R. Ray and M. R. Valenzuela (1999), "A cross-country study of household poverty and inequality on unit record household budget data", *Economic Development*, 48(1), 177-208.

Lanjouw, P and M.Ravallion (1995), "Poverty and household size", *The Economic Journal*, 105(433), 1415-1434.

Lipton, M. (1983), "*Demography and poverty*", Staff working Paper 616, World Bank, Washington D. C.

Maddala, G. S. (1983), *Limited-Dependent and Qualitative Variables in Econometrics*, Cambridge University Press, Cambridge.

McCulloch, N. and B. Baulch (1999), "*Distinguishing the chronically from the transitorily poor: Evidence from rural Pakistan*", Working Paper No. 97, Institute of Development Studies, University of Sussex, Brighton.

Mckay, A. and H. Coulombe (1996), "Modeling Determinants of Poverty in Mauritania", *World Development*, 24(6), 1015-1031.

Meng, X., R. Gregory and Y. Wang (2005), "Poverty, inequality and growth in urban China, 1986-2000", *Journal of Comparative economics*, 33, 710-729.

Nazli, H. and S. Malik (2003), "Housing: Opportunity, Security, and Empowerment for the poor", *The Pakistan Development Review*, 41(4), 893-908.

Rodriguez, A. and S. Smith (1994), "A Comparison of determinants of Urban, Rural and Farm poverty in Costa Rica", *World Development*, 22(3), 381-97.

Rodriguez, J.G. (2000), "*The determinants of poverty in Mexico: 1996*", Ph.D. dissertation, University of Missouri, Columbia.

Schultz, T. P. (1988), "*Education investments and Returns*", Handbook of Development Economics, Vol. 1, North Holland.