Developing Country Studies
ISSN 2224-607X (Paper) ISSN 2225-0565 (Online)
Vol 2, No.6, 2012

Rural-Urban Poverty Nexus: Impact of Housing Environment

Dr Saidatulakmal[1] and Madiha Riaz[2*]

1. Senior Lecturer, School of Social Science, University Sains Malaysia
2. PhD Student, School of Social Science, University Sains Malaysia

* E-mail of the corresponding author: madihatarar@hotmail.com

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 possible determinants of poverty status, employing Bivariate models. In general, this study tries to seek in depth knowledge of the household environmental and public utilities for poverty status that account for poverty differentials in Pakistan specifically in urban and rural areas. The intensity of poverty is more in rural areas compared to urban for the same characteristics of variable viz-a-viz more poor are concentrated and residing in rural areas We find ownership of assets is a key determinant in defining poverty status in both areas but in rural region its impact more. Population occupying a house with more rooms, having better sewage system, Piped water and toilet type are mostly belonging to the class which is non-poor in both regions. 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, Housing Environment.

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. 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 select housing environment condition 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 of poverty in rural and urban areas of Pakistan related to population and household environment, which 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.

The determinants of poverty in Kenya by employing both binomial and polychotomous logit models using the 1994 Welfare Monitoring Survey data was explored by Geda, et al (2001. The study found that poverty is concentrated in rural areas in general and in the agriculture sector in particular. Being employed in the agriculture sector accounts for a good part of the probability of being poor. The educational attainment (particular high school and university education) of the head of the household is found to be the most important factor that is associated inversely with poverty. The study found that female-headed households are more likely to be poor than male-headed households and that female education plays a key role in reducing poverty and greater household size is positively correlated with poverty.

The determinants of poverty in Tunisia on the basis of the household budget survey carried out in 1990 by the Institute of National Statistics was analyzed by Ghazouani (2001). Logistic regression model is estimated in this study and the consequences drawn are that main factors in urban and rural areas which influence poverty include household head's education, child dependency ratio, ratio of male and female employees in household, socio professional category of the head, family residence, type of lodging and the share of food budget. The socio-professional category of the head of household, the head being unemployed or an agricultural worker increase the likelihood of poverty. The results indicate that female heads household is significantly associated with a higher likelihood of 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%.

The incidence and determinants of food poverty in Pakistan was investigated by Bibi, et al (2005). Study is based on micro data taken from the 1998-99 round of merged HIES and PIHS. To explore the determinants of food poverty three multinomial logit regression models are estimated on the basis of three mutually exclusive categories of poor, non-poor and very poor household. The result indicates that age of head of household reduces the probability of the household being poor or very poor and increases the probability of the household being non-poor. The sex of head of household has a significant positive effect on the probability of non-poor category and has a negative effect on the remaining two alternatives. The effect of household size indicates that with an increase in household size, the probability of being poor also increases. Family type has no significant effect at regional level while at the national level nuclear families are more likely to be non-poor. Schooling of head of the household has a significant effect on poverty both at the national level as well as regional level. Possession of land or financial assets increase the likelihood of being non-poor and reduce the likelihood of being poor and very poor.

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.

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. Outcome proposes 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. 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 in rural and urban areas specifically; this is newness 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. The first approach 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. 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.

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

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

Where F is the cumulative distribution function for u_i and

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

The likelihood function can be given by,

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

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

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	1. Extremely poor households are that whose per capita per month expenditure are less than 0.5 of poverty line.
2-Transitory poor	2-Transitory poor households are those who's per capita per month expenditure lies between the "0.75 of line.
3-Non-poor	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. We have categorized poor and non-poor into rural and urban sample and find their marginal effects

Rural and Urban Samples

In general the factors strongly associated with poverty status are the same in both rural and urban areas. However the marginal effects associated with these regresses are larger in rural areas .Result in Table-3.

Table-3

Logit Model-Urban-Rural Sample-Poverty Dependent Variable

Variable	**Urban Region** Marginal Effects		**Rural Region** Marginal effect	
Public Utilities Variables				
Electricity connection	-0.0959*	(0.00)	-0.0859*	(0.00)
Gas connection	-0.0412 *	(0.00)	-0.018 *	(0.00)
Telephone connection	-0.0824*	(0.00)	-0.0724*	(0.00)
Housing Characteristics Variables				
Occupancy status of house	-0.112*	(0.01)	-0.211*	(0.00)
Having two rooms in house	-0.0176*	(0.00)	-0.0421*	(0.00)
Having three rooms in house	-0.1108*	(0.00)	-0.176*	(0.01)
Having four rooms in house	-0.1456*	(0.00)	-0.168*	(0.00)
Having five or more rooms in house	-0.1634*	(0.00)	-0.206*	(0.00)
Piped water source	-.0283*	(0.01)	-0.022	(0.47)
Hand pump source	.0062	(0.58)	-0.08	(0.00)
Motorized pumping source	-.0211 **	(0.04)	-0.019	(0.00)
Flush connected to public sewerage	-.0343*	(0.00)	-0.059	(0.00)
Flush connected to open drainage	-.0056	(0.58)	-0.031	(0.00)
Underground drainage -sewerage system	-.0269*	(0.01)	-0.023	(0.51)
Open drainage sewerage - system	-.0046	(0.54)	-0.033	(0.00)
*,** shows the significance at 1%,5%.	-			

The results in Table-3 shows household environmental variables, which consist of housing characteristics and public utilities, are mostly significant and have different impact on poverty status of household lying in urban rural region. The **public utilities** like electricity connection, telephone connection and gas connection used in this model show significant impact on poverty status of household in **urban region** and the result shows that it is 9%,4% and 8% more likely that household lie in non-poor category as compared to those households that have no electricity ,gas and telephone connection respectively. While the results shows that electricity and telephone connection have significant impact on poverty status of households in **rural region**. The estimated results shows that a household is 8%, 2% and 7% more likely to be non-poor as compared to those household, which have no electricity, gas and telephone connection. The estimated coefficients of dummies that show number of **rooms in a household** are also statistically significant in both rural and urban regions. Furthermore the estimated coefficient of these variables indicates that as the number of rooms in a household increase, the probability of lying in non-poor category also increases. The

results show the household in which there are two rooms; the probability of being in non-poor category is 2% and 4% higher than in the household in which there is only one room in urban and rural region respectively. The increase in the probability goes to 11% and 14%, 16% and 17%,1 6% and 20% in the households that have three, four and five or greater than five rooms in urban and rural regions respectively.The coefficient **for house ownership** dummy is significant in both rural and urban region. The results indicates that it is 21% and11%more likely that the household fall in non-poor category as compared to those households that are not the owner of their houses in rural and urban region respectively.

Both the **variables toilet type** significantly impact on poverty status in rural region but the variable "Flush connected to open drainage" is statistically insignificant in urban region. The results show that if the "households has Flush connected to public sewerage" than it is 3% and 6% more likely that household lies in non-poor category in urban and rural region respectively, as compared to those households which have no toilet facility in house and if the "household has Flush connected to open drainage" than it is 3% more likely to be non-poor in rural region as compared to those households which have no toilet facility in house.

The variable **"drainage and sewerage system**" has different impact on poverty status of household in rural and urban region. The results show that in urban region the variable "Open drainage and sewerage system" has statistically insignificant impact on poverty status but the variable "Underground drainage and sewerage system" has statistically significant impact on poverty status of households and there is 3% more likelihood to be non-poor as compared to those households which have no drainage and sewerage system. In rural region the results are entirely opposite to urban region.

The variable "Underground drainage & sewerage system" has statistically insignificant impact on poverty status of households while the variable "Open drainage sewerage & system" has statistically significant impact on poverty status of households and it is 3% less likely to be lying in non-poor category if the household has Open drainage sewerage and system.

The **water source** in household has also different effects on the poverty status of the households in both rural and urban region. In Urban region the variable "Hand pump source" has statistically insignificant impacts on the household poverty status while the other sources have significantly impact on household poverty status. If the household has "piped water" and motorized pumping" source than it has 3% and 2% more probability to fall in non-poor category as compared to those which have 'traditional" water source like well, canal, spring.

In the rural region both the variable "hand pumping' and motorized pumping" water source have statistically significant impact on poverty status of household while the variable "piped" water source show insignificant impact on poverty status of household. The result shows that it is 2% more likely to be non-poor if the household has motorized pumping water source as compared to "traditional" water source like well, canal, spring. While it is 8% less likely to be non-poor if the household has hand pumping water source.

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.

The results in table 4 show that household environmental variables, which consist of housing characteristics and public services, are significant and estimated results of ordered logit model validate the findings of the logit model. The results shows that having **electricity connection** raises the probability of being non poor as compared to those household which have no electricity by 17% and 11% in urban region while it is 15% and12% in rural region in transitory poor and extreme poor group respectively., the estimated coefficient of

gas is not statistically significant in rural region but in urban region it is1 2% and 14% more likely to be non poor as compared to those household which have no gas connection in transitory poor and extreme poor category respectively.The estimated coefficient of **telephone connection** in urban region indicate that it is 16% and1 1% more likely to be non-poor as compared to those households which have no telephone connection in transitory poor and extreme poor categories respectively, while in rural region result show that there is 15% and 10% more probable to be non poor if the household has telephone connection in transitory poor and extreme poor respectively**.**

Table-4

Results of Ordered logit model where poverty as dependent Variable. /Urban-Rural Sample

Public Utilities Variables	**Urban Region**		**Rural region**	
	Transitory	Extremely	Transitory	Extremely
	Marginal Effects		Marginal Effects	
Electricity connection	-.1673*	-.1154*	-.1531*	-.1242*
Gas connection	-.1187*	-.1439*	.0163	.0073
Telephone connection	-.1593*	-.1123*	-.1538*	-.1028*
Housing Characteristics Variables				
Occupancy status of house	.0087	-.0018	-.0903*	-.0558*
Having two rooms in house	-.0341*	-.0529*	-.0761*	-.0539*
Having three rooms in house	-.0334*	-.0069*	-.1053*	-.0407*
Having four rooms in house	-.0474*	-.0096*	-.1192*	-.0433*
Having five or more rooms in house	-.0524*	-.0105*	-.1939*	-.0644*
Piped water source	-.0203**	-.0043**	-.0094	-.0040
Hand pump source	-0.03*	-0.051*	.0566*	.0251*
Motorized pumping source	.0077	.0016	-.0292**	-.012**
Flush connected to public sewerage	-0.041*	- 0.011*	-.1170*	-.0449*
Flush connected to open drainage	-.0372	.0079	-.0341*	-.0144*
Underground drainage & sewerage system	-.0114	-.0024	-.0293	-.0120
Open drainage sewerage & system	-.0218*	-.0036*	.0189**	.008**
Probabilities of Critical Values are at 1%, 5%, 10%,indicating significance by *, **, *** respectively				

The estimated coefficient of dummies that show the **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 in both rural and urban region. If there are two rooms in the house as compared to that house which has one room, it raises the probability of being non-poor by 3% and 5% in transitory and extremely poor groups respectively in urban region. The probability of being non-poor also increases if the household has three, four, five and more than five rooms in transitory poor and extremely poor category respectively in urban region.While in rural region if there are two rooms in the house as compared to that house which has one room, it raises the probability of being non-poor by 7% and 5% in transitory and extremely poor groups respectively. The probability of being non-poor also increases if the household has three, four, five and more than five rooms in transitory poor and extremely poor category respectively in rural region and the ratio of increasing the probability is higher in rural area as compared to urban region. The estimated coefficient of the house ownership variable also increase the probability of non-poor by 9% and 5% as compared to those households which are not the owner of their houses in transitory poor and extremely

poor categories respectively in rural region while in urban region this variable has no significant impact on poverty status of household.

Results indicate that "**household has underground drainage** and sewerage system" is a more important determinant of poverty as compared to "household has open drainage and sewerage system" which is statistically insignificant and has no significant impact on poverty status of households lying in different poverty categories in urban region while it is conflicting in rural region. The estimated coefficient of "household has underground drainage and sewerage system" shows that it is 2% and 0.3% more likely to be non-poor as compared to those households which have no drainage and sewerage system in transitory poor and extremely poor categories respectively in urban region, while this variable has no significant impact on poverty status of household in rural region.

The toilet types used in the household have also significant impact on poverty status of households. As the results shows that the variable "**Flush connected to public sewerage**" increases the probability of household being non- poor as compared to those household which have no toilet system by 4% & 12% and 1% & 4% in transitory poor and extremely poor categories respectively in urban and rural region. While the variable " Flush connected to open drainage" also raise the probability of non poor (which is quite less than the other toilet type variable) by 3% and 1% in transitory poor and extremely poor categories respectively in rural region but this variable has no statistically significant impact on household poverty status in urban region. The variables **water source** also shows significant impact on the poverty status of the household in different poverty categories in rural and urban region. 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 like (canal, well and spring. The results are similar to logit model only the difference is in marginal effect .In rural region the variable "piped water source" has insignificant impact on household poverty status while the variable "motorized pumping" raise the probability of household to be non-poor as compared to those households which have "traditional" water source like (canal, well and spring) .

Conclusion

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

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. Empirical findings for rural and urban region are same with minute marginal effect differences, as poverty is more concentrated in rural region.

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.

This academic article was published by The International Institute for Science, Technology and Education (IISTE). The IISTE is a pioneer in the Open Access Publishing service based in the U.S. and Europe. The aim of the institute is Accelerating Global Knowledge Sharing.

More information about the publisher can be found in the IISTE's homepage:
http://www.iiste.org

The IISTE is currently hosting more than 30 peer-reviewed academic journals and collaborating with academic institutions around the world. **Prospective authors of IISTE journals can find the submission instruction on the following page:** http://www.iiste.org/Journals/

The IISTE editorial team promises to the review and publish all the qualified submissions in a fast manner. All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Printed version of the journals is also available upon request of readers and authors.

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar