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Awan, Masood Sarwar and Iqbal, Nasir and Muhammad, Waqas

Department of Economics, University of Sargodha., Pakistan  
Institute of Development Economics (PIDE), Pakistan

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## **The Impact of Human Capital on Urban Poverty: The Case of Sargodha City**

**Masood Sarwar Awan**

Assistant Professor, Department of Economics  
University of Sargodha, Sargodha, Pakistan  
Tel: 92-300-870-4388 E-mail:awan811@hotmail.com

**Nasir Iqbal**

Staff Economist, Pakistan Institute of Development Economics (PIDE)  
Quaid-i-Azam University Campus, Islamabad, Pakistan  
Tel: 92-51-924-8038 E-mail: nasir@pide.org.pk

**Muhammad Waqas**

Graduate Student, Department of Economics  
University of Sargodha, Sargodha, Pakistan  
Tel: 92-321-860-0229 E-mail: economist147@hotmail.com

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### **Abstract**

The positive relationship between human capital and income/wages has been supported by empirical research. Millennium Development Goals (MDGs) and the Poverty Reduction Strategy Paper (PRSP) enormously emphasize on human capital for curbing poverty. The economic development in East Asian countries is also linked with investment in education for the development of human capital. This study is designed to investigate the relationship of different levels of education and experience upon urban poverty at medium sized city in Pakistan such as Sargodha. A survey-based analysis was carried out on a sample of 330 households. Poverty status of the individual is defined by using adjusted official poverty line. Results show that education and experience is negatively related with the poverty status of individuals and this fact sustains even in separate gender estimates as well. This implies education of poor is necessary in breaking the vicious circle of poverty. Combined effort by public, private, community participation and NGO's with special focus on elementary (Primary and middle) education is suggested for reducing poverty by increasing the productivity of the poor through education.

**Keywords:** Human Capital, Urban Poverty, Sargodha, Pakistan

## **1. Introduction**

Substantial empirical evidence supported the hypothesis of positive relationship between human capital and income/wage. Investment in human capital is considered as an affective tool to improve the welfare of people around the world (Schultz, 1960, 1961, 1975). Becker (1962) defines “the skills, education, health, and training of individuals as human capital and it is capital because these skills or education are an integral part of us that is long-lasting, in the way a machine, plant, or factory lasts”. “All those qualities of a person, such as knowledge, health, skills and experience that affect his or her possibilities of earning current and future money income, psychological income, and income in kind is called human capital” (Kooreman and Wunderlink, 1997).

Human Capital Theory is mainly based on education because it imparts knowledge and skills (Tilak, 1994). Numerous studies showed that investment in education allow the poor to escape from poverty. There are various channels through which education affect the poverty status of the individual. The direct effect of education is measured in term of pecuniary benefits accrue by the individual through more income or wages (Becker, 1962; Mincer, 1974; Hungerford and Solon, 1987; Tilak, 1994, 2002, 2005 and Zuluaga, 2007). Investment in education increases the ability of the individual and makes them more productive and more efficient (Lockheed et al., 1980, and Jamison and Lau, 1982). An individual, with more productivity and better skilled has more choices and opportunities. Better opportunities help in getting good job and in doing good business and hence increase the income level. In competitive market wages paid equal marginal productivity of the labor, so higher the productivity higher the returns. Poverty is negatively linked with the income level of household, so higher wages implies low poverty.

The indirect effect of education on poverty is measured in term of non pecuniary benefits (Zuluage, 2007). These non pecuniary benefits are explained under the multidimensional concept of poverty which defined as poverty cannot be conceptualized in ‘material’ terms such as low income or low levels of material wealth. Lack of opportunities, vulnerability and deprivation of basic capabilities such as health and education have been considered and emphasized as key aspects of poverty; so it is indeed a multi-dimensional phenomenon (Arif and Faiz, 2007). Education not only improves the income level of the household but also fulfills the basic necessities of life and raises the living standard. The education indirectly helps in the fulfillment of basic needs like water and sanitation, utilization of health facilities and housing etc (Jeffery and Basu, 1996). Education affects health, mortality, fertility, housing conditions, and recreation among others (Zuluage, 2007).

In the Millennium Development Goals (MDGs) and the Poverty Reduction Strategy Paper (PRSP) human capital is considered as a weapon against poverty reduction. Therefore the idea that education is a determinant of poverty occupies much attention in recent years. Pakistan has owned the poverty reduction strategy paper (PRSP) in

which there is an enormous emphasis on human capital for curbing poverty because it is realized that without human capital formulation the goal of development or poverty alleviation is inevitable in developing country (Mughal, 2007). Economic progress of East Asian countries in 1970s and 1980s which was primarily due to investment in education (World Bank, 1993) manifolds the importance of human capital for poverty reduction in developing countries.

Various studies, in Pakistan, have confirmed the negative relationship between human capital and poverty (Note 1). These studies showed that the attainment of education enhances the earning potential of the individuals and consequently, the increased earning will definitely help them to be out of poverty. The scope of these studies was very limited in explaining the impact of successive levels of education upon poverty status of the individual. Secondly, these studies did not consider the role of experience in enhancing the income level of the individual. Thirdly, there is no detail study that covers this issue at medium sized city in Pakistan.

Keeping this in view, there is needed to explore the linkages between human capital and poverty, in more detail, at city level. Based on existing literature, the question we analyze whether attainment of higher level of education is negatively linked with the level of poverty at small city? Along with educational deprivation we will also analyze whether experience of an individual matters in making someone non-poor? Female of our society is the deprived section due to unequal basic rights and unequal educational and employment opportunities. We also analyze, whether the impact of human capital on poverty is different across the male and female?

The sample city, chosen in this study to analyze the impact of human capital on urban poverty is 'Sargodha' which is 10<sup>th</sup> largest city of Pakistan. The estimated population of the city was 0.57 million in 2007 where 0.464 million people resided in municipal jurisdiction and almost 0.106 million dwelt in cantonment area (PDS, 2007). Sargodha city is the hub of the district's agriculture and industrial activities. The major crops of this area are wheat, rice, sugarcane and citrus. Moreover, the district has gained immense fame in citrus production; especially the oranges (*kinnows*) of Sargodha which have earned worldwide praise in its taste. Hosiery, textiles, chemicals and soap are major manufactures of this area. Sargodha has grown at a very rapid rate and is a major urbanized area in Punjab. It is the industrial, commercial, financial and service centre of the country. In recent years, the urban infrastructure has become overburdened and the city has been subjected to considerable urban strife (Awan and Iqbal, 2010). In city, poverty level is 14.3 percent, but it is very low among the educated households employed in services sector and too high among unskilled worker and owned business operator (Awan and Iqbal, 2010). Keeping the importance of city in view, it becomes essentials to conduct a detail study on poverty.

The rest of the paper is organized as follow: Section two provides the snap shot of Sargodha city. Section three and four consists on methodology and result discussion respectively. Last section sums up the paper and tries to draw some policy options.

## **2. Sargodha City at Glance**

Sargodha district is located in the Punjab province of Pakistan, the capital of the district is Sargodha city. The district is divided into six Tehsils. The total district area is 5854 square kilometers. Total population of the district is 3.072 million. Moreover, the urban population is 0.864 million which is 28 percent of the total district population and rural population is 2.208 million which is 72 percent of the total. There are 161 union councils of the district whereas 40 of urban area and 121 of rural area. The Tehsil Sargodha has the largest population standing at 1.283 million and lowest population is 0.270 million of Tehsil Sahiwal (Table 1).

The urban population is 28.1 percent and rural is 71.9 percent of the total district population. The literacy rate of the district is 64 percent whereas the 77 percent for the males and 54 percent for the females. The population of Sargodha city was 0.57 million as estimated on December 2007 where as 0.464 million people resided in municipal jurisdiction and almost 0.106 million dwelt in cantonment area (PDS, 2007). It is expected that population of the city will be almost 1.22 million in 2025 (PER, 2007).

Regarding the education facilities the district has its own University of Sargodha along with a medical college and an agriculture college. In public sector, there are 21 degree colleges out of it 12 are for females and 9 for males (Table 2). There are 1834 primary schools, 341 elementary schools and 203 high schools in the district. In 2005-06, the enrollment in government mosque school, government primary school, government middle school, government high school, higher secondary school, intermediate colleges, degree colleges, polytechnic institutes and vocational institutes were 8804, 212306, 103129, 110859, 2660, 1663, 21365, 2162 and 1505 respectively. The literacy rate stands at 46.3 percent where 64.2 percent for urban and 39.1 percent for rural areas.

The total budget of the District Health Government Sargodha in 2007-08 was 560.285 million. Out of it 453.078 million spent in salaries, 48.465 million for the purchase of medicine and non-salary budget was of 58.742 million. For the maintenance and repair of hospitals 2.650 million spent. There are 89 vacant posts of doctors in the district and 456 of paramedical staff. The District has one District Head Quarter Hospital, four Tehsil Head Quarter Hospital, and 14 Rural Health Centers, 117 Basic Health Units, 35 dispensaries, 8 MCH centers and 1 TB hospital working (Table 3).

## **3. Data and Methodology:**

### *3.1 Data and Data Collection Procedure*

In order to measure the impact of human capital on poverty at city level generally primary data at household level is used. For this study, primary data is collected under the joint survey 'Assessment of Poverty in Sargodha City' by Pakistan Institute of

Development Economics (PIDE) Islamabad and University of Sargodha (UOS) Sargodha in May 2008 (Note 2). Sargodha city is mainly divided into 22 union councils. The information is taken through randomly selecting 11 union councils and then interviewed 30 households at random in each selected union council. For selecting union councils and household, we used the information provided by Federal Bureau of Statistics. This activity provides the detailed information of 330 households in the city on major components required for analysis.

### 3.2 Definition of Poverty Line

Poverty estimates are measured by using official poverty line (Note 3) estimated by the Planning Commission of Pakistan. By using the data from Pakistan Integrated Household Survey (PIHS) 1998-99, Planning Commission estimated the absolute poverty line at Rs. 673.54 per month per adult equivalent. This poverty line is adjusted by consumer price index (CPI) to get the adjusted poverty line for 2008. The Commission has already adjusted the poverty line for the periods 2000-01, 2004-05 and 2005-06 using the Consumer Price Index (CPI). In 2004-05, the official poverty line was Rs. 878.64 per month per adult equivalent and in 2005-06 the inflation adjusted official poverty line was Rs. 944.47 per month per adult equivalent (GOP, 2008). Adjusted official poverty line, for 2007-08, used in this study is Rs. 1140 per month per adult equivalent (Note 4). To make poverty line compatible with urban areas, this line was adjusted by rural urban food price differentials.

### 3.3 Multivariate Regression Model

We use a binomial logistic regression model for estimating the impact of human capital variables on poverty. In this model the dependent variable is dichotomous: 0 when a household is above and 1 when below the poverty line. This type of model is explained as follow:

Let's assume the general equation

$$Y_i = f(X_{1i}, X_{2i}, \dots, X_{ki}) \quad \dots \dots \dots (1)$$

$Y_i$  is the dependent variable representing the Households' level of poverty and  $X_i$  are the various household level of education and experience. Let's suppose that the response variable  $y^*$  captures a true status of the household either as poor or non poor so we can estimate the regression equation as follows

$$y_i^* = \sum_{j=0}^k X_{ij} \beta_j + \epsilon_i \quad \dots \dots \dots (2)$$

$y^*$  is not observable and is a latent variable. We can observe  $Y_i$  as a dummy variable that takes the value 1 if  $y^* > 0$  and takes the value 0 otherwise.  $\beta$  is the vector of parameters and error terms are denoted with  $\epsilon$ . The error terms entail the

common assumption of zero mean and underlying distribution of the error terms is logistic. Let  $P_i$  denotes the probability that the  $i^{th}$  household is below the poverty line. We assume that the  $P_i$  is a Bernoulli variable and its distribution depends on the vector of predictors  $X$ , so that

$$P_i(X) = \frac{e^{\alpha + \beta X}}{1 + e^{\alpha + \beta X}} \dots\dots\dots (3)$$

$\beta$  is a row vector and  $\alpha$  is a scalar. The logistic function to be estimated is then written as

$$\ln \left[ \frac{P_i}{1 - P_i} \right] = \alpha + \sum \beta_i X_{ij} \dots\dots\dots (4)$$

$\ln \left[ \frac{P_i}{1 - P_i} \right]$  is the natural log of the odds in favor of the household falling below the poverty line whereas  $\beta_j$  is the measure of change in the logarithm of the odds ratio of the chance of the poor to non poor household. Equation (4) is estimated by maximum likelihood method and the procedure does not require assumption of normality or homoskedasticity of error in predictor variables.  $X_i$  is the vector of independent variables. These variables include experience, middle, matric, intermediate, bachelor and professional.

Generalized functional form of the model is as under:

$$P = a + b_1 Exp + b_2 Midl + b_3 Mat + b_4 Inter + b_5 Bach + b_6 Pr of + b_7 Sex + e$$

- $P$  = Poor (1 if poor, otherwise 0)
- $Exp$  = Experience (Continues, no of years)
- $Midle$  = Middle (1 if individual has middle education, 0 otherwise)
- $Mat$  = Matric (1 if individual has matric education, 0 otherwise)
- $Inter$  = Intermediate (1 if individual has intermediate education, 0 otherwise)
- $Bach$  = Bachelor (1 if individual has bachelor education, 0 otherwise)
- $Pr of$  = Professional (1 individual has profession (master and above qualification) education, 0 otherwise)
- $Sex$  = Sex (1 if individual is male, 0 otherwise)
- $e$  = Error Term

After classifying the individuals into poor and non-poor, we construct the human capital variables. The educational variables are dummy variables and one of them will get the value one in response to the individual's highest educational attainment. It

means the educational level of the individual will either fall in middle, matriculation, intermediate, bachelors or professional (masters and above) category. Here 'primary education' is used as reference category. Other variables include experience and gender of individuals. The experience variable is attained through subtracting the years of schooling and school starting age from the age of a person. It is not the actual but the potential experience. To make potential experience more meaningful we have included the individuals with age above 14 years. The gender is denoted as 'male' in variables where female will be the reference category.

## **4. Results and Discussions**

### *4.1 Univariate Analysis*

Education is an important component of human capital and it is very much effective in poverty reduction. So we must have to check out the situation regarding education. It is seen that 14.2 percent individuals never attended educational institutions whereas 55 percent availed the education facility in past and 30.8 percent are presently enrolled in educational institutions (Table 4).

Regarding the absorption of educational institutions we have seen that out of the total students who were enrolled or presently studying 73.4 percent are students of government institutions and 25.2 percent are students of private institutions (Table 5). It shows that in city public sector is still providing the educational facility to many students. Only 0.6 percent is in Deeni Madaris, 0.3 percent is in schools which are running by NGOs, Trusts and Foundations, 0.1 percent in education schools and 0.4 percent are in the category of 'others'.

### *4.2 Bivariate Analysis*

By using poverty line mention in previous section, extend of poverty is measured in the study area. The analysis indicates that the head count ratio in Sargodha city is 15.1 percent. After defining the poverty status in the study areas, we draw correlate between poverty and successive level of educational attainment. Results indicate that the incidence of poverty is negatively correlated with the level of schooling. With each additional level of schooling reached, the poverty incidence falls. Poverty level is highest (41.5 percent households) among those household whose education is primary and lowest (2.0 percent households) among those whose education is professional (Table 6). From the simple analysis, it becomes that clear that education can contribute in great measure to poverty reduction. So education is important not only because it builds human capital in and of itself, but also because education levels are closely correlated with the health status of the population the second crucial element of human capital (ADB, 2005).

### *4.3 Multivariate Analysis*

A logistic regression model was estimated for probability of being poor on experience

and different levels of education. The estimated results are demonstrated in Table 7. In overall sample, it is observed that the attainment of middle, matriculation, intermediate, bachelors and professional (masters or above qualification) will decrease the likelihood of being poor as compared to the bench mark category. All the educational variables are negatively affecting the poverty status of individuals. Moreover, as we increase the educational qualification of individuals their chances of being non-poor increases or we can say that the probability of being poor declines vigorously. Coefficient of male is positive but this is insignificant. Negative coefficient of experience also shows the importance of experience in poverty reduction.

In separate regressions, for male and female segment of society, we witnessed the results in compliance with the overall results. In both separate results all educational variables are negatively related with the poverty status of the individuals. For males the achievement of middle, matriculation, intermediate, bachelors and professional will decrease the probability of being poor as compared to primary education. Last column shows the result of female, all level of education shows that probability of being poor decreases as we move from lower level of education to the higher level of education and coefficient of experience also shows the importance of experience in poverty reduction.

## **5. Conclusion and Policy Options**

This study is done to estimate the impact of human capital on poverty reduction. The data used for this study is from a survey of Sargodha city conducted by University of Sargodha and Pakistan Institute of Development economics (PIDE) consisting of a sample of 330 households. Analysis of the data shows that education-especially (Primary and middle) education, helps to reduce poverty by increasing the productivity of the poor, and majority of higher education students come disproportionately from rich families. So public spending on heavy subsidization of the higher levels of education often favors the well off. It is suggested that government should focus on the primary and middle level education and combined effort with private sector, community participation and NGO's will ease the task of government to achieve the target of poverty reduction. Development researchers and practitioners have argued that women are significantly less educated than men in Pakistan and the possible explanation for the gender gap in education are, the high opportunity cost of girls' schooling, custom of seclusion of women, purdah and consideration of girls' labor as the substitute for their mothers' labor e.g., by caring for siblings especially when mother is busy in raising household income either through food production or wage labor. Our result shows that with the increase in level of education there is greater chance to go out from poverty even in the case of females'. Keeping in view the importance of female education in poverty reduction, it is suggested that government should focus on the education of females. Closing the gender gap in education will be helpful in breaking the vicious circle of poverty,

because it is widely accepted that the social rates of return to female education are very high.

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## Notes

Note 1. For example Nasir and Nazli, 2000; Qureshi and Arif, 2001; Haq, 2005, Jamal, 2005; Kurosaki and Khan, 2006, Arif and Iqbal, 2009, Awan, et. al, 2008, Awan and Iqbal, 2010

Note 2. Funding for survey ‘Assessment of Poverty in Sargodha City’ is provided by Pakistan Institute of Development Economics (PIDE)

Note 3. Official poverty line is based on 2350 calories per adult equivalent per day with the consumer price inflation during 2004-05 and 2005-06, constructing spatial price index for all food and energy items (around 89) and adjusting household expenditures to provide consistent consumption welfare measure across all 1100 primary sampling units in the country and during the year of the survey, following a cleaning protocol consistent with the one adopted for data set of 2004-05 and adopting adult equivalent measures for consumption to adjust for number of children

(GOP, 2008).

Note 4. For per adult equivalent expenditure, this study has used an equivalent scale that gives a weight of 0.8 to individuals younger than 15 years and 1 for all other individuals

Table 1: Union Councils and Population in District and its Tehsils

Tehsil/District	Number of Union			*Population (Million)		
	Total	Urban	Rural	Total	Urban	Rural
District Sargodha	161	40	121	3.072	0.864	2.208
Bhalwal	31	8	23	0.531	0.141	0.39
KotMoman	22	3	19	0.383	0.051	0.332
Sahiwal	14	3	11	0.27	0.058	0.212
Sargodha	62	22	40	1.283	0.528	0.755
Shahpur	16	3	13	0.309	0.059	0.25
Sillanwali	16	1	15	0.296	0.027	0.269

Source: Punjab Development Statistics, 2007, \* estimated on December, 2007

Table 2: Educational Facilities

Institutions	Male	Female	Total
University	-	-	1
Agriculture college	-	-	1
Medical College	-	-	1
Degree College	9	12	21
Inter College	1	1	2
Higher Secondary School	15	17	32
High School	122	81	203
Elementary School	116	225	341
Primary School	951	883	1834
Mosque School	194	-	194
Polytechnic institutes*	1	-	1
Vocational institutes*	-	13	13

Source: District Government Sargodha, \* Punjab Development Statistics, 2007

Table 3: Health Facilities

Institutions	Number	Beds
District Head Quarter Hospital	1	447
Tehsil Head Quarter Hospital	4	180
Rural Health Centre	14	280
Basic Health Unit	117	134
MCH Centers	8	-
Dispensaries	35	-
TB Hospital	1	100

Source: District Government Sargodha

Table 4: Education Status

Type	Percent
Never Attended School/Institution	14.2
Attended School/Institution in Past	55.0
Currently Attending School/Institution	30.8

Source: Computed from the survey of 'Assessment of Poverty in Sargodha city'

Table 5: Type of Education Facility Availed

Type	Percent
Government (Public)	73.4
Private	25.2
Deeni Madaris	0.6
NGO, Foundation	0.3
Education School	0.1
Others	0.4

Source: Computed from the survey of 'Assessment of Poverty in Sargodha city'

Table 6: Poverty Measures by Educational Attainment of Household Head

Category	% Share	Non Poor (%)	Poor (%)
Primary	14.1	58.54	41.5
Middle	12.1	77.14	22.9
Matriculation	27.6	85.00	15.0
Intermediate	12.1	88.57	11.4
Bachelor	16.6	98.83	1.2
Professional	17.6	98.04	2.0

Source: Computed from the survey of 'Assessment of Poverty in Sargodha city'

Table 7: Logistic Regression Model of being poor with multiple independent variables

Variables	Overall sample	Male sample	Female sample
Constant	0.919* (2.506)	0.926* (2.523)	1.360* (3.896)
Experience	-0.024* (0.976)	-0.014* (0.986)	-0.038* (0.963)
Education			
Middle	-0.925* (0.396)	-0.975* (0.377)	-0.957* (0.384)
Matriculation	-1.927* (0.146)	-1.796* (0.166)	-2.261* (0.104)
Intermediate	-2.644* (0.071)	-2.740* (0.065)	-2.683* (0.068)
Bachelor	-3.870* (0.021)	-3.706* (0.025)	-4.320* (0.013)
Professional	-4.607* (0.010)	-4.918* (0.007)	-4.492* (0.011)
Male	0.223** (1.250)		

Source: Computed from the survey of 'Assessment of Poverty in Sargodha city'

Note: \*, \*\*, \*\*\* represent the level of significant as 1 percent, 5 percent and 10 percent respectively. In parenthesis odd ratios are given.