

QUANTIFICATION OF SOCIO-ECONOMIC DEPRIVATIONS OF URBAN SLUMS: A Case Study of Faisalabad

Riaz AHMED* and Usman MUSTAFA**

Abstract

The emergence of urban slums has become a burning challenge caused by the population pressure on the cities. In Pakistan the gravity of the issue of urbanization is as severe as in any other country of third world. The growth rate of urban population is rising day by day and decade by decade. The rapid urbanization has forced the poor to settle on open spaces which now are called urban slums. Socio-economic conditions of the slum dwellers are very poor than those of normal settlements. In present study an attempt has been made to quantify the qualitative variables and to find the level of deprivation in the slums of Faisalabad. To find the level of deprivation, socio-economic opportunity index (SEOI) is established. The index is made by refining and reconstructing the variables used in universally acknowledged Multidimensional Poverty Index (MPI), 2014 and poverty of opportunity index (POPI) presented in human development in south Asian report, 1998. In SEOI four important variables (health, education, income and housing) have been taken into account. Through stratified sampling technique 15 slums and 213 households were considered as a universe of the study. To see the total effect of various deprivations, Atkinson formula is used. The results of socio-economic opportunity index (SEOI) shows that about 60 per cent of slums population is deprived of basic social and economic opportunities. Government should take steps to make the basic necessities possible for these poor slums dwellers. A lot of work has been done on slums both in Pakistan and at world level. On the basis of these studies, an attempt has been made to find the level of deprivation in slums of Faisalabad, a third most populous city of Pakistan. The research is based on primary data which was collected through a field survey with the help of a questionnaire.

Key words: Urban slums, POPI, MPI, SEOI, Faisalabad.

I. Introduction

The world has witnessed rapid urbanization during the last couple of decades. It has been the key problem of almost all the developing and some of the developed countries of the world. The population pressure on the cities has gives birth too many problems like bad sanitation, environmental pollution, illiteracy, poor health, rapidly increasing traffic level and bad housing etc. There are numerous problems related to urbanization but the problem of finding appropriate shelter is chief among them. The

* PhD Scholar, Department of Economics, Preston University, ** Head, Department of Business Studies, and Chief, Training and Project Evaluation Division, Pakistan Institute of Development Economics, Islamabad.

urban population is rapidly increasing day by day. It was 32 per cent in 1950, rose up to 39 per cent and 48 per cent in 1980 and 2000 respectively [World Bank (1999)].

The rise in population is threatening; thereby creating and perpetuating the variety of socio-economic problems. In 1980, there were only 86 cities with population over one million. This figure rose up to 550 in 2015 [UN Population Division (2002)]. This clearly shows that how fast the world is urbanizing. The situation is even more dangerous in the developing countries. The share of urban population was 17.8 per cent in 1951. It jumped to 28.5 and 32.5 in the year 1981 and 1998 respectively [Government of Pakistan (2001)]. The urban population is expected to grow to 4.9 billion by 2030 while rural population will decrease by 28 million. Much of this growth in cities is caused by their respective urban slum populations, with almost half the residents of developing countries and up to 78 per cent in the least developed countries living in such areas [UN-HABITAT (2003)]. The population of slum-dwellers worldwide grew to 1.2 billion in 2008 [UN-HABITAT (2008)]. This rapid urbanization forced the poor people to settle in open spaces. These open space settlements are called urban slums.

According to Encyclopedia of Britannica, Slum is defined as “a residential area that is physically and socially deteriorated and in which satisfactory family life is impossible”. The existing literature exposes mainly two kinds of slums: (a) transferred and, (b) non-transferred. Transferred slums are those whose property rights have been transferred to dwellers while non-transferred slums are those whose property rights have not been transferred to dwellers residing there. The living conditions in transferred slums are better than those in non-transferred [Ahmed, et al. (2015)]. Similarly [Sarin (1982)] pointed out that living conditions in planned settlements are better than that of non-planned. Education is basic right of every human being. Unluckily very few slum dwellers can get this right. Literacy rate in slums is very low. This condition is not similar in all the slums of the world. The reason is that generally authorities are reluctant to provide this opportunity to dwellers in developing and least developed countries [ROBERTS (2000)].

People living in slum areas are very poor and their socio-economic conditions do not allow them to live a healthy life. They have no access to safe water and sanitation [Naveed and Anwar (2014)]. Living conditions in slums are poor. People have to live in adverse physical conditions in slums area. Slums are generally dirty and unclean. There is no proper way of cleanliness [Bandyopadhyay and Agrwal (2013)]. Similarly Hina (1992) pointed out the miserable conditions of slum dwellers. In fact the term slum not only suggests indecent and miserable conditions but also implies other important aspects such as informality [The World Bank (2000)]. Generally slum people do not have access to safe drinking water which is major cause of diseases there. About 2 million people die every year due to diarrheal disease. Most of them are children less than 5 year of age. The main cause of child death is diarrhea [Graf, (2008)]. [Qureshi (1982), Asghar (1984), Chaudhry (1991)]

and Kazmi (1999)] found that infant mortality rate is very high in these settlements due to water related diseases, poor sanitation and inadequacy of basic amenities. Overcrowding takes part in high prevalence of epidemics. Epidemic-prone infections in overcrowded area are usually high and it also may cause many other diseases like influenza and rheumatic heart disease [Siegel (1997)].

Increasing number of slums create a major challenge to development. There is need to take measures to improve the physical environment of the dwelling places like basic amenities of toilets, proper drainage, sewerage system and water supply [Sufaira (2013)]. Urban slums are located in low lying environmentally hazardous area where there are inadequate facilities like food, shelter, sanitation and health care [Akhtar (2009)]. A lot of studies have also been conducted using the multidimensional phenomena to measure wellbeing. Many researchers have used this method to find the real picture of slum poverty. Alkire and Santos (2010) adopted this method to find the level of poverty in America. Similarly Jutino (2005) used this method for poverty estimation in Brazil. Aristei (2011) used this technique to measure the well being of people of Italy. Sial, et al. (2015) adopted this method to measure the level of poverty in Pakistan.

Faisalabad being third most populous city of Pakistan having 104 listed urban slums has been used as a case study. The main objective of the study is to quantify the different socio economic deprivations of inhabitant of urban slums by developing "socio economic opportunity Index (SEOI)".

II. Methodology

The selection of appropriate methodology is an imperative credential to materialize the core objectives of the study. A field survey was carried out in 15 sampled slums of Faisalabad. The aim of the Study was to quantify the socio economic deprivations of Slum population in Faisalabad. A comprehensive questionnaire was used to collect the required data.

1. Target Population

- Total number of katchi Abadis in Faisalabad =106."
- Information available regarding dwelling units = 104.
- Thus the universe consisted of 104 slums of Faisalabad.

2. Sampling Frame

A list containing information about 104 katchi abadis of Faisalabad was obtained from the Directorate of katchi abadis Government of the Punjab. This list was used as a Sampling frame.

3. *Sampling Techniques*

Stratified random sampling technique was used to get the representative sample. The list of showed that number of dwelling units varied from 42 to 2851. The representative sample was obtained on the basis of this variation. At first, the whole population was divided into six strata where it was assured that the slums in the same group were homogenous in characteristics but heterogeneous externally.

TABLE 1
Category of Households in the Slums

Stratum	Number of Households	Number of Slums
A	Below and 80	33
B	81-200	32
C	201-350	16
D	351-500	11
E	501-1000	7
F	Above 1000	5

Source: Researcher's own calculations.

4. *Selection of Sample Urban Slums*

The sampled samples were selected on the basis of variability of dwelling units in different slums. Following sampling technique was used to get the representative sample.

$$n = \frac{N \cdot \sum N_h S_h^2}{\frac{N^2 d^2}{Z^2} + \sum N_h S_h^2}$$

(C. P Parel et.al)

where,

N = Total number of slums,

N_h = Total numbers of slums in "h" Stratum,

D = Sampling error acceptable for study. Due to resource and time constraint 0.1 error was accepted at slum level,

Z = Confidence level = 95 per cen.

$$n = \frac{(104)(5)}{\frac{(104)^2(0.1)^2}{(1.96)^2} + 5}$$

$$n = \frac{520}{(28.1549+5)}$$

$$n \cong 15$$

[For detail see Ahmed, et. al. (2015)].

Proportional allocation method was used to obtain Sample from each stratum:

$$n_i = \frac{N_h}{N} \times n$$

[For detail see Ahmed, et. al. (2015)].

For each Stratum, Abadis were selected randomly. Out of 15 katchi abadis 10 were transferred and 5 were non-transferred. It was also observed that 5 out of 15 were closer to the city centre while others were in suburbs. These representative katchi abadis covered almost the whole city.

TABLE 2
Selected Urban Slums

Sr. No.	Selected Katchi Abadis	Number of Households
1.	Beshan S.Wala	42
2.	Chowk Choudhry	56
3.	M.H.S Tariq Abad	58
4.	Ghariba Abad	66
5.	Madan Pura	78
6.	Bahadar S.Wala	97
7.	Malak Pura	133
8.	Water Works	116
9.	Manawala Square 80	180
10.	Malkhanwala	256
11.	Railway Phatak Number 8	288
12.	Girga Ghar	408
13.	Fire Brigade	443
14.	Partab Nagar	638
15.	Mai Di Jhugi	2851

Source: Researcher's own calculations.

5. Selection of Sample Respondents

After Selection of sample katchi abadis, the sample size of respondents was found. This was done on the basis of variability in Income. For this purpose a pre-survey was conducted from 36 households in six strata. Proportional allocation method was adopted to determine the sample size.

$$n = \frac{N \cdot \sum N_h S_h^2}{\frac{N^2 d^2}{Z^2} + \sum N_h S_h^2}$$

(C. P parel et.al)

where,

N = Total number of households in 15 katchi abadis = 40866.

N_h = Total number households in “h” stratum.

S_h = Socio-economic variation among the households in “h” Stratum.

D = Sampling error acceptable for the study (Due to lack of resources 0.0414 error was accepted at household level).

Z = Confidence level = 95 per cent.

$$n = \frac{40866 \times 3914}{\frac{(40866)^2 (0.0414)^2}{(1.96)^2} + 3914} = 213$$

[For detail see Ahmed et. al. (2015)]

This over all sample size was proportionally distributed in different strata.

$$n_i = \frac{N_h}{N} \times n$$

[For detail, see Ahmed, et. al. (2015)].

Again in each Urban Slums the sample size was distributed according to the weight of number of households.

$$n_i = \frac{N_h}{N} \times n$$

- N_h = Number of households in 'h' Slum.
 N = Number of households in selected Slum of the stratum.
 N = Distributed sample of the Urban Slums.

TABLE 3
Selection of Sample Respondents

Sr. No.	Name of Selected Slums	Number of Sample Distributed
1.	Beshan S.Wala	10
2.	Chowk Choudhry	13
3.	M.H.S Tariq Abad	14
4.	Ghariba Abad	15
5.	Madan Pura	18
6.	Bahadar S.Wala	11
7.	Water works	13
8.	Malik Pura	14
9.	Manawala Square 80	19
10.	Malkhanwala	13
11.	Railway Phatak Number 8	15
12.	Girga Ghar	13
13.	Fire Brigade	15
14.	Partab Nagar	14
15.	Mai Di Jhugi	14

Source: Researcher's own calculations.

III. Socio-Economic Opportunity Index (SEOI)

The Global Multidimensional Poverty Index (MPI) devised by Alkire in 2014 covers 108 developing countries. In general the MPI composed of three dimensions; thereby covering the set of 10 indicators. These three dimensions include health, education and living standard. If we keenly observe the third dimension i.e., living standard, it can be divided into many sub components but housing status and level of income are the best indicators of this dimension. Thus in the present study four important variables (income, housing, education and health) have been considered to build socio economic opportunity index (SEOI). Infact this (SEOI) is modified form of poverty of opportunity index (POPI) introduced by UNDP in 1997. The socio economic opportunity Index (SEOI) has been used to find the level of deprivation of slum dwellers of Faisalabad, the third mega city of Pakistan. The detail of four variables included in (SEOI) is as follows.

1. Education Deprivation

Education is one of the important parameters to define the level of deprivation of any society [Khan, et al. (2011a)]. It has been included in POPI and MPI. In the same way in SEOI the education deprivation in urban slums of Faisalabad has been measured by means of taking weighted average of variables as mentioned below.

- a) The percentage of illiteracy.
- b) The percentage of primary School age children who are not attending school.

Weighting framework is based on the ratio of the adult sample population to the primary school age sample population.

2. Income Deprivation

Income is the very basic and simple measure to assess the well being of the people as it helps to purchase most of the marketable attributes [Khan, et al. (2013)]. Being a most important variable for the computation of the deprivation, Income has been placed as a basic parameter in poverty of opportunity index (POPI). In the same way in developing SEOI, income is also taken as a basic variable. In SEOI, \$1.25 per person is used as a minimum below which the basic necessities of life could not be financed.

3. Health Deprivation

Deprivation of health facilities is one of the important indicators to find the level of deprivation [Khan, et al. (2011b)]. Following POPI and MPI, health variable is included in the SEOI. Health Deprivation is calculated as follows.

- a) The average of three most relevant indicators i.e., the percentage of people who do not have proper sewerage system, percentage of people having no access to safe drinking water and percentage of people having no access to doctor and lady health visitors.
- b) Infant mortality rate, it is an important indicator to know the health deprivation. Weightage is based on the ratio of overall sample population to the under one year sample population.

4. Housing Deprivation

Housing status is one of the key parameters to measure the socio-economic opportunities regarding urban slums. To measure the housing deprivation, average of three variables is taken by giving them equal weights.

- a) Percentage of people living more than three people in one room commonly used as cut off in most of the developing countries.
- b) Percentage of population deprived of paved (Pakka) house.
- c) Average of percentage of population having no access to kitchen, bathroom and toilet.

To calculate the socio-economic opportunity index, the POPI and HPI formula are used. To see the total effect of various deprivations the Atkinson formula is used the detail is given as follows.

IV. Results of Socio-Economic Opportunity Index (SEOI)

Results of each variable are given as follows [For detail see Ahmed, et. al. (2015)].

1. *Education Deprivation*

- a) Illiteracy rate: 34.09.
 - b) Cut-of-school children as a percentage of primary school- age population: 31.9.
- Sample population (10 year and above): 1430.
 - Primary school age sample population: 160.
 - Weight = Sample population (10year and above)/Primary school-age sample, population = $1430/16 = 8.93$, Education deprivation = $34.9 * 8.93 + 31.1 * 1/8.93 + 1 = 37.86\%$.

2. *Income Deprivation*

People below poverty line = 80%.

3. *Health Deprivation*

- a) Population deprived health access (Average of three variables i.e. no access to clean drinking water, sewerage facility, no access to LHV/Doctor), $[(65.71 + 7.14) + 30.5 + 32.64] = 45.33\%$.
 - b) Infant mortality rate = 11.11%
- Total sample population = 1590/
 - Under one year sample population/under one year sample population: $1590 / 39 = 40.76$, Health deprivation = $(45.33 * 40.76 + 11.11 * 1)/40.76 + 1 = 44.51\%$

4. *Housing Deprivation*

- a) People living more than 3 per room = $23.47 + 42.25 = 65.67\%$.
- b) People having semi pakka house = $36.60 + 4.20 = 40.80\%$.
- c) People deprived of kitchen, bathroom and Toilet = $(61.00+0.9)/2 = 30.95\%$.
- d) Housing deprivation = $(65.72 + 40.80 + 30.95)/3 = 45.82\%$.

The socio-economic opportunity Index (SEOI) to formulate the socio economic opportunity index (SEOI), the following Atkinson (1970) formula of deprivation is applied.

$$X_A = (P_1 X_1^\mu + P_2 X_2^\mu + P_3 X_3^\mu + P_4 X_4^\mu)^{1/\mu}$$

where X_A is the average required, X_1 , X_2 , X_3 and X_4 are four deprivations i.e. education, income, health and housing which are giving equal weights i.e;

$$P_1, P_2, P_3 \text{ and } P_4 = 0.25 \text{ and } \mu = 1/4$$

$$X_A = (0.25*37.86^4 + 0.25*80^4 + 0.25*44.51^4 + 0.25*45.82^4)^{1/4}$$

$$X_A = 59.85\%$$

The result shows that about 60 per cent of population living in urban slums of Faisalabad is deprived of basic necessities of life. Although there is chance of overlapping of variables yet it is difficult to find the degree of this overlapping. About 65 per cent of slums population is deprived of basic opportunities of life in Lahore, a second mega city of Pakistan [Rukhsana and Sheraz (2006)].

V. *Conclusion and Policy Implications*

1. *Conclusion*

Socio economic opportunity index (SEOI) is calculated in the present study to see the degree of deprivation in the urban slums. The study includes four variables (Income, Education, housing and health) to calculate the socio economic opportunity index (SOEI). The results show that the basic income deprivation is the highest among all the variables followed by health, housing and education. It is apparent from the results of SOEI that about 60 per cent of inhabitants of slums of Faisalabad are deprived of basic socio-economic opportunities. It indicates that majority of slums dwellers are unable to get basic necessities of life.

2. *Policy Implications*

- a) Government should take steps to make the basic necessities in reach to the slum dwellers.
- b) NGO's should play their active role in improving the socio-economic conditions of these poor urban slum dwellers.
- c) Keeping in view Oringi Project Model in Karachi community participation development programs should be launched.

Preston University, and Pakistan Institute of Development Economics, Islamabad, Pakistan.

Bibliography

- Ahmed, R., U. Mustafa and A.U. Khan, 2015, Socio-economic status of transferred and non-transferred urban slums: A case study from Faisalabad, Pakistan Development Review, 54(2): 947-962.
- Akhtar, T., 2009, Migration and living condition in urban slums: Implications food security, UnnayanOnneshan, The Innovators, Centre for Research and Action on Development, Dhaka: Bangladesh.
- Alkire, S., and J. Foster, 2014, Global multidimensional poverty index 2014, Oxford Poverty and Human Development Initiative, (Available at): <http://www.ophe.org.uk>.
- Alkire, S., and M.E. Santos, 2010, Acute multidimensional poverty: A new index for developing countries, OPHI working series 7.
- Aristie, D., and B. Bracalente, 2011, Measuring multidimensional inequality and well-being: Method and an empirical application to Italian regions, Statistica, 71(2): 239-266.
- Asghar, J.H., 1984, A study of socio-economic conditions of females in katchi abadi Chaudry colony, Lahore, Department of Social Work, Punjab University, Lahore.
- Atkinson, AB, 1970, On the measurement of inequality, Journal of Economic Theory, 2(3): 244-263.
- Bandyopadhyay, A., and V. Agrawal, 2013, Slums in India: From past to present, International Refereed Journal of Engineering and Science, 2(4): 55-59.
- Britannica, Encyclopedia, 2010, Encyclopedia of Britannica, Encyclopedia Britannica Inc, Corporate site.

- Government of Pakistan, 2001, Population and housing census 1998, Islamabad, Pakistan.
- Graf, D., 2008, Water disinfection and hygiene behavior in an urban slum in Kenya, *International Journal of Environmental Health Research*, 18(5): 335–355.
- Hina, I., 1992, Role of government in the improvement of katchi abadis, Unpublished thesis, Department of Economics, Governmentt College, Lahore.
- Jutino, 2005, Empirical applications of multidimensional inequality analysis, University of Sussex, England (working paper 16).
- Kalim, and S.A. Bhatti, 2006, Quantification of socio economic deprivations of squatter settlement's inhabitants: A case study of Lahore, 6th global conference on business and economics, Gutman Conference Center, USA.
- Kazmi, S.M.F., 1999, Attitude of residents of katchi abadis and slums towards low-cost, Multi-Storeyed housing, Unpublished thesis, University of the Punjab, Lahore.
- Khan A.U., A. Saboor, S.A. Mian and I.A. Malik, 2011a, Approximation of multidimensional poverty across regions in Pakistan, *European Journal of Social Sciences*, 2(24): 226-236.
- Khan A.U., A. Saboor, S. Ahmad and I. Ali, 2011b, Mapping and measuring of multidimensional poverty in Pakistan: Empirical investigations, *Pakistan Journal of Life and Social Sciences*, 9(2): 121-127.
- Khan A.U., A. Saboor, A. Hussain, S. Sadiq and A.Q. Mohsin, 2013, Investigating multidimensional poverty across the regions in the Sindh province of Pakistan, Springer, *Soc Indic Res*, DOI 10.1007/s11205-013-0511-8.
- Naveed, M., and M. Anwar, 2014, Socio-Economic conditions and health status of urban slums: A case study of Jogo chak, Sialkot, *Asian Journal of Humanities and Social Sciences*, 3: 4.
- Parel, C.P., 1973, Sampling design and procedure, *Social Server Research Design*, Quezons city trial edition, : 27.
- Qureshi, A.B., 1984, The situation of children living in katchi abadis, Patiala House, Lahore, Department of social work, University of the Punjab, Lahore.
- Roberts, P., 2000, Knowledge, information and literacy, *International Review of Education*, 46(5): 433-453.
- Sarin, M., 1982, Urban planning in the third world: The chandigarh experience, Oxford: 1st edition, Alexandrine Press.
- Sial, H.M., A. Noreen and R. U. Awan, 2015, Measuring multidimensional poverty and inequality in Pakistan, *Pakistan Development Review*, 54(2): 947-962.
- Siegel, G., 1997, Geographic analysis of pertussis infection in an urban area: A tool for health services planning, *Amercian Journal of Public Health*, 87(12): 2022.
- Sufaira, C., Socio economic conditions of urban slum dwellers in kannur municipality, *IOSR Journal of Humanities and Social Science*, 12-24 e-ISSN:10(5): 2279-0837, p-ISSN: 2279-0845. www.iosrjournals.org www.iosrjournals.org.

- UN Population Division, 2002, World urbanization prospects: The 2001 revision data tables and highlights, United Nation Population Division, ESA/P/WP.173, New York: USA.
- United Nations Human Settlements Program, 2003, The challenge of slums: Global report on human settlements 2003, Geneva.
- United Nations Human Settlements Program, 2009, UN-HABIT Annual report 2008, Available:<http://www.unhabitat.org/pmss/getElectronicVersion.asp?nr¼2670& alt¼1> Accessed 17.03.09.
- World Bank, 1999, World Bank Development Indicators, Report 19140, The World Bank, Washington, D.C.
- World Bank, 2000, World Bank Development Indicators, The World Bank, Washington, D.C.