

**The Role of Household Income and Public Provision of Social Services
in Satisfaction of Basic Needs in Pakistan: A Cross District Analysis**

by

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Abstract

Is household income enough for human development or government should heed to direct provision of social services to improve capabilities development. The former emphasized by the World Bank and later by the UNDP. This paper test this argument by estimating a basic need policy model for Pakistan using cross district data from Pakistan. The results are consistent with the view that government provision of social services affects human capabilities significantly. However, the ultimate constraints on the sustainable capability development are those of material resources.

I. Introduction

Since Pakistan came into being, lack of opportunities has been an acute socio-economic problem. In 1970 about 25 million people lived in income poverty whereas 42 million suffered from the poverty of basic human opportunities in health, education and material well being. Over the years its acuteness in relation to the other variables has accentuated despite significant economic growth and the generous foreign assistance ¹[UNDP (1999), Hussain (2003)].

Pakistan disaggregated statistics show wide variation across regions of Pakistan. Some areas have achieved the level of developed countries but some areas lagged far behind. For instance, infant mortality rate (IMR) [a measure of satisfaction of four basic needs (Goldstein, 1985, and Hicks and Streeten, 1985)] was 32 per thousand live births in Islamabad compared to 98 per 1000 live births in Sargodha, in 1998-99. Similarly, literacy rate was very high in Islamabad, 91.3 per cent and very low in Layyah, 20 per cent. Layyah is also very poor in terms of income poverty with 91 percent of its population consuming less than the income required to fulfil their basic needs. In this situation, there is an urgent need to find effective remedial measures to build the basic human capabilities to break out the present states of deprivation and reduce disparities across the districts of Pakistan by bringing the districts with poor performance to the level of the districts with extremely good ones.

Among various approaches, 'Basic Need' approach is seen as a more direct route to raise the capabilities of the poor. The approach defines deprivation not in terms of income but in

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¹ During the last twenty years, government expenditure on education and health varies between 1 to 4 percent of GDP.

terms of inability to meet the certain basic human needs that are defined by the hunger and malnutrition, ill health, lack of education, safe drinking water, sanitation facilities, and the decent housing² [Goldstein, 1985 and Hicks and Streeten, 1985]. The critical question is: how we can achieve the goal of human development: through growth oriented policies or through public provision of social services? The rout may vary by district with different level of development in the base year.

In the literature, two approaches the growth and the public provision of social services particularly basic health and education in the development of human capabilities are widely discussed³. The former emphasized by the World Bank⁴ and later by the UNDP⁵ to achieve the target of human development. World Bank emphasizes on the maximization of production with a view that a large volume of output per head increases capabilities of the people and enhances human well being as the people in rich regions have more access to the basic health and education facilities and more choices to lead a full and productive life compared to the people living in the poor region. South Korea is a good example of these policies. Whereas UNDP emphasizes on the public provision of social services and seen it as a direct attack on human poverty. The proponents of this approach give a number of reasons to follow this approach. First, people are not sufficiently knowledgeable about health and nutrition and therefore not spend incremental income wisely. Second, there is a serious skewed distribution of incomes within a household, which could be overcome only through direct provision of the goods and services. For example, female education can be increased by constructing more public schools for girls near their houses. Third, some basic need can only be met through public provisions such as sanitation facilities and to some extent safe drinking water. Fourth, the public provision of these facilities are expected to help all people equally, while focusing on the growth oriented policies such as increasing labour skill and their productivity or employment opportunities benefit a certain group of people not all. A comparison of socio economic indicators of the developing countries showed that the government program had played a pivotal role in the improvement in infant mortality rate. For instance, in Sri Lanka half of the reduction in IMR is due to anti malaria program of the government [Hanmer, *et al*]. However, no body (including World Bank and UNDP) deny the importance of economic growth⁶. as resource-constraint has

² Housing means decent shelter, which have sanitation facilities and safe drinking water.

³ White, 1999, Sen, 1997, UNDP, 1996, WB, 1995 and 1990, Griffin and McKinley, 1994, Siddiqui, 1995, Annand and Ravallion, 1993, Kanbur, 1987, Hicks, 1979, Hanmer *et al*(2003) etc

⁴ See Christiaensen *et al*, 2002, Alwang *et al*, 2002, World bank 1990.

⁵ United Nation Development Program

⁶ In Zimbabwe, it found that individuals invested in human capital but the economy did not create the types and quantities of jobs to reward this

been a major reason for the low public investment in the social sectors in the developing countries.

Before exploring the role of household income and public provision of social service in capability development, understanding the poverty creating mechanism is necessary in order to devise an effective solution at the district level. Therefore, the objective of the study is two fold. Using micro household survey data, the study estimates head count ratio of poverty, inequality, literacy rates and a number of indices for public provision of social services at the districts level⁷. These indicators help us to understand the reasons that why a district has achieved the level of a developed country while the others are lagging behind. In what ways do the some districts with exceptionally good human development contrast with those with exceptionally bad one, etc. Second it develops a simple basic need policy model to explore the routes to the capabilities development. The results of the study would help to suggest effective anti poverty policies to expand the opportunities for the poor at the district level.

The plan of the study is as follows. The section II describes the data sources. A basic need policy model is developed in the section III, along with a number of socio economic indicators , which have been used as input in the model. Major finding based on descriptive statistics and estimated model are reported in two subsections-A and B- of the section IV. Final section concludes identifying the need at the district level.

II. Data and Methodology

The data is assembled at the district level for the four provinces of Pakistan, Punjab, Sindh, NWFP, and Balochistan. The distinction among districts located in the rural and the urban areas is also made because human development indicators between regions are not comparable, low in the rural and high in the urban areas. Initially we have 107 districts from four provinces of Pakistan. Some districts are excluded from the analysis due to data limitation. The present analysis is based on 78 districts, 39 from the urban (24 from Punjab, 5 from Sindh, 7 from NWFP, 3 from Balochistan) and 39 from the rural (24 from Punjab, 6 from Sindh, 7 from NWFP, 2 from Balochistan). The sample is dominated by Punjab [being a largest province] and more districts from the provinces other than Punjab are dropped due to unavailability of consistent data set and due to data problem such as misreporting. Various

investment. Resultantly, returns to human capital declined substantially and cannot reduce poverty. On the other hand, the relationship between physical assets ownership and well being remained constant(Alwang *et al*, 2002). On the other hand, case of Sri Lanka 's indicates that progress in human development can be achieved through government intervention independent of economic growth(Anand and Ravallion, 1993).

⁷ When district level data is not available, we used stratum-which include more than one district. However, variables are defined on per capita

sources have been used to gather data at the district level, i.e., Pakistan Socio Economic Survey⁸ (PSES) (Pakistan, 1998-99), Pakistan Integrated Household Survey-(PIHS) (Pakistan, 1998-99). The socio-economic indicators of provinces are taken from Census data –1998 (Pakistan, 2002a, b, c, d) and Mahmood (2003).

Government expenditures on public provision of education, health services, water supply, and sanitation facilities at the district level are not easily available. In order to get an idea of public provision of social services at the district level, three input indicators called public policy indicators (PPI) for public provisions have been developed to portray the level of public provision of social services; education, health, water and sanitation facilities. This information is not available from PSES. It is taken from HIES-1998-99 (Pakistan, 1999) for the rural areas and from socio-economic indicators⁹ (Pakistan, 2001) for Pakistan. Using these two sources of data, information for urban areas has been extracted. Infant mortality rates at the district level are taken from a study by Mahmood (2003). He has estimated IMR from Population Census conducted in March 1998 at the districts level in the rural and the urban areas of Pakistan.

a. Monetary Variables

1. *Households' income per capita (Y_{PCH})*. Y_{PCH} is total household income of a district divided by its population.

2. *Poverty (POV)*: Poverty is perceived in terms of income. It is measured by head count ratio using basic need poverty line i.e., percentage of population consuming less than income required to satisfy their basic needs.

3. *Basic Need Poverty Line*: Poverty lines for the rural and the urban areas for the year 1989-90 are taken from Siddiqui and Kemal¹⁰ (2002) and updated for the year 1998-99 after adjusted for inflation. Poverty lines are Rs. 8464 and Rs 7017 per year per person for the urban and the rural areas¹¹, respectively.

4. *Inequality (Gini)*: Differences in income measure difference in opportunities for

basis.

⁸ PSES is conducted by Federal Bureau of Statistics (FBS) in 1998-99 under MIMAP project of Pakistan Institute of Development of Economics. It consists of all urban and rural areas of the four provinces of Pakistan. The sampled households covered during 1998-99 are 3564 (2268 rural and 1296 urban). It provides information on income, consumption, labour force, education, and health etc. To keep consistency in variables, majority of variables are taken from PSES.

⁹ Socio economic indicators at the district level are developed by Federal Bureau of Statistics and Provincial Bureau of Statistics jointly. This is the first attempt of compilation of socio-economic indicators at the district level.

¹⁰ For detailed methodology to estimate poverty line (see Siddiqui and Kemal, 2002).

¹¹ Ideally poverty line should be adjusted for various regions to reduce regional bias due to variation in prices across the region. Because, people living in mountain areas need more calories from food and use more fuel to cope with the cold temperature. Thus using same poverty line for all areas may over estimate or under estimate poverty (Chakrabarty, 2003). The use of poverty line estimated on the basis of the

reducing poverty. Gini coefficients measure inequality within a specific region. Poverty and inequality is calculated on the basis of PSES-1999 using DAD program (Duclos, 2001).

b. Non-Monetary Variables

The following two non-monetary variables, infant mortality rate (IMR) and literacy rate (LR), reflect aggregates of individual capabilities.

5. *Infant Mortality Rate (IMR)* is defined as infant death rate per 1000 live births. It reflects satisfaction of at least four basic needs (Goldstein (1985)) and considered the best indicator to measure the capabilities development.

6. *Literacy Rate (LR)*: It measures educational status (stock) of a district. It is defined as the ratio of literate persons to the population of 10 years and above.

IMR and LR are variables are bounded variables. Once a direction of the relationship is established, beyond some point they become indeterminate. For example, LR cannot go beyond 100 percent. In the model it is assumed that targeted values of IMR and LR are 5 per thousand live births (minimum level of IMR a country has achieved) and 100 percent, respectively. A non linear transformation of the infant mortality rate $-\text{Log}(\text{IMR}-5)$ measures proportionate gap between the actual and the desired level of capabilities. Similarly, $\text{log}(100-\text{LR})$ measures the proportionate gap between target of 100 percent literacy rate and actual literacy rate in a district.

7. *Female Education*: Female literacy rate and mothers education in number of years of schooling are also calculated from PSES-survey and included among other explanatory variables. The empirical literature suggest that mother's education and infant mortality rate are negatively associated (Sathar. Z. A, 1987, Shehzad, (2003)). However, there is some evidence that this variable is not significant for the countries, where females are less empowered (Kabeer, 2003).

8. *Public Policy Indicators (PPI)*: Three input indicators have been developed to portray the level of public provision of social services; 'education', 'health', and 'water and sanitation' facilities. They measure the level of public investment in education, health units, supply of clean water and sanitation facilities. A brief description of these indicators is given below.

8a. *Public provision of education*: Paper focuses on the primary education only. Because, not only budget allocation among various sectors is important but also allocation of a particular

averages for the rural and urban areas may underestimate incidence of poverty.

budget within the sector is important in determining the development of human capabilities of the poor. For example, if a large portion of budget for education is allocated to the tertiary or university education rather than primary education. Such pattern is likely to be disadvantageous for the poor segmentation of population. Therefore, primary enrolment and number of primary school are taken as indicators of public provision of basic education.

The number of public/primary schools in a district determines the level of government investment in primary education in absolute term. While, primary school age population per school in a district determines the size of public investment in primary school relative to their needs. To some extent it also indicates the quality of education, as population per school rises, the standard of education is expected to decline. The study assumes that basic education is a necessary condition for the development of human capabilities¹².

8b. *Public Provision of health facilities (PPH)*: Population per health units and population per bed are used as proxies to measure the size of health facilities per district provided by the government. The indicators are constructed by giving different weights to various health facilities, highest to hospital and lowest to other health units. The ratio of population to aggregate number of health facilities determines the population per unit of health facilities.

8c. *Public Provision of water supply and sanitation facilities (PPWS)*: Three indicators for public provision of water and sanitation facilities are constructed: 1) availability of tap water (PPTW), 2) availability of two types of sanitation facilities, covered (CSEW) and open (OSEW), 3) availability of government services to collect garbage.

First, a dummy variable “D” is defined as $D=1$ if facility exists in a district then weighted by the percentage of population using that facility. Primarily, separate indicators for each facility are developed by measuring percentage of population using the facility. Then indicators have been integrated to develop a composite indicator by taking average of PPTW, CSEW, OSEW.

Three variables described in sections, 8a to 8c determine policies adopted by the government at the district level. Each index is divided by their respective highest value and multiplied by 100. The ratio varies between ‘0’ and ‘100’. It provides a measure of disparities across the district. The closer the value of index to ‘100’ the minimum is the disparity from developed district. However, a large disparity in income and in public provision across the districts tends to coexist with under investment in human capital that translates into lower welfare

¹² Thus primary education is the primary focus.

indicators such as IMR and literacy rate.

III. Basic Need Policy Model

The satisfaction of the basic needs reflects [in aggregates] individual capabilities such as live long and healthy life, acquire knowledge, have enough resources to buy food and other necessities. In the literature two approaches to achieve the goal of satisfaction of the basic needs are widely debated; economic growth vs public provision of social services¹³. Empirical studies measure individual's capabilities by various indicators such as infant mortality rate (IMR), life expectancy (LE) and literacy rate (LR) etc [Goldstein, 1985, Annand and Ravallion, 1993, Kanbur, 1987, Hicks, 1979, Hanmer *et al* (2003)].

Let a set of capabilities 'B' defined over IMR, LE, and LR.

$$B = [IMR, LE, LR]$$

First indicator —infant mortality rate (IMR) — is considered the best welfare indicator among other. Because it measures availability of at least four basic needs (Goldstein (1985)) i.e., an outcome variable of inputs- health and nutrition. Infants are very sensitive to water born diseases. Thus, it is a good indicator of availability of clean water. Second capability development indicator is literacy rate (LR). It indicates accumulation of the knowledge. Third indicator is life expectancy, which is highly correlated with IMR. The decline in infant death rate accompany by an increase in life expectancy at birth. Due to unavailability of data, it is dropped from the set of capabilities development indicators¹⁴. The next question is which rout should be followed for capabilities development, growth proposed by the World Bank or the public provision of social services proposed by the UNDP. Both of them do not deny the importance of the other as income is one of the many options that people would like to have to buy basic necessities. Assuming that satisfaction of basic needs or capability development is a function of income, an equation is defined in log form as follows.

$$(1) \quad \text{Log} (B_i) = \alpha + \beta \text{Log} (Y_{HPC_i})$$

¹³ see Annad and Ravallion, (1993) and Hanmer et al(2003)for detailed discussion.

¹⁴ The conclusion about life expectancy can be drawn on the basis of the results for IMR.

Where $B = IMR, LR, Y_{HPC} = \text{per capita income}, i = \text{Districts}$

A negative sign of β indicates that economic growth expands the human capabilities directly. It increases individual's command over goods and services such as food, health, education that ultimately reduces IMR, which indicate, which indicates development of individuals capabilities. This view is based on the assumption of equal distribution of income. At the second stage income distribution variable-GINI- coefficient is included in the equation based on the view that not only growth but growth with equal distribution is important.

$$(2) \quad \text{Log}(Bi) = \alpha + \beta \text{Log}(Y_{HPC_i}) + \delta \text{GINI}$$

Another view is that relationship between income per capita and capability development is steepest at low income and flat beyond some point (Annand and Ravallion, 1993). This suggests that social outcomes can only be improved significantly if income poverty is reduced. Therefore, they suggest that the relationship between income and capability development should be tested empirically after controlling for incidence of absolute poverty measured by the head count ratio. Thus equation one is extended by including poverty estimates measured by percentage of the population consuming less than the income required for satisfaction of the basic needs.

$$(3) \quad \text{Log}(Bi) = \alpha + \beta \text{Log}(Y_{HPC_i}) + \gamma \text{Log}(POV_i)$$

Where POV stands for poverty measured by head count ratio

If β ceases to be significantly different from zero and γ turns out to be statistically significant, then it can be concluded that it is not growth in income that is important but reduction in poverty help to achieve the goal of capabilities development.

The model is further extended to explore the answer to the crucial question: Does the relationship between income and IMR or poverty and IMR coexist with public provision of social services? The role of public provisions in the satisfaction of basic needs is emphasized by many empirical studies (Annand and Ravallion, 1993, UNDP, 1996). This hypotheses is tested The equation-1 is further extended by including indicator of public provision of social

services such as population per health unit, the number of schools, primary enrolment, and the provisions of sanitation and supply of clean water facilities. Here model postulates that B_i depends not only on individual's command over the goods measured in terms of per capita income (Y_{HPC}), poverty reduction, but also on the public provision of social services (PPI_j). The relationship is tested estimating the following equation.

$$(4) \quad \text{Log}(B_i) = \alpha_i + \beta_1 \text{Log}(Y_{HPC_i}) + \beta_2 \text{Log}(POV_i) + \beta_{4i} \sum \text{Log}(PPI_j)$$

Where i stands for districts and j stands for various indicators for Public provision of social services, education, health, sanitation facilities and clean water supply

If the relationship between IMR and income or/and IMR and poverty vanishes in the presence of public provision of the social services that suggests that public provision of the health services is the main force behind the capability development. However, income plays an important role in the development of individuals' capabilities. Because, growth not only raises private income but also increase government revenue. Public provision of social services depends on the available resources. The link between government provided social services and income per capita rests largely on the assumption that increase in income of a district contributes to GDP growth, which provides resources for social expenditure. An equation for public provision of social services at the district level is defined as a function of per capita income of district to test the hypotheses that income is a necessary if not sufficient condition for capabilities development.

$$(5) \quad \text{Log}(PPI_{ik}) = C_0 + C_1 \text{Log}(Y_{HPC})$$

*Where PPI = Public Policy Index for Government provided social services
 k = Education, health, water and sanitation facilities*

The primary enrolment and the number of primary schools in a region are included as indicators of public provision of basic education. Population per health unit are used to measure health facilities at the district level. Separate equations are estimated for health and education services as a function of income per capita. Lastly an equation for safe drinking

water and sanitation facilities is also estimated.

In the literature, education is the most important single variable. Evidence from the empirical studies reveals that social returns from female education are higher in terms of reduced fertility, reduced infant mortality, lower school dropout rates or high literacy rates, (Sathar, 1987) etc. Here, mothers' literacy rate and mothers' education are also included among other explanatory variables. Variables measuring quality of public provision, primary school age population per primary school, the ratio of female literacy to male literacy rates have been included in the model during the estimation procedure.

Income poverty and 'how can it be reduced in the country where 32 percent population, about 45 million people, do not have enough income to satisfy their basic needs has been the focus of many development policies of the country. Here it is assumed that not only income but also capabilities development work to reduce income poverty. Lower capabilities cause higher poverty and vice versa. Therefore, a poverty equation is defined as follows

$$(6) \quad \text{Log}(POV_i) = P_0 + P_1 \text{Log}Y_{HPC_i} + P_2 \text{Log}(IMR_i - 5)$$

Model is estimated by two stage least square (2SLS) method. The model developed here incorporates two types of variables, monetary and non-monetary variables.

IV. Results

The model is estimated with two stages least square (TSLS) to identify routes to the capabilities development in various districts of Pakistan. Major findings are presented in two subsections. First section discusses socio-economic indicators across the districts. Second section focuses on regression results of the model.

a. Socio-Economic Indicators by Districts

The analysis based on aggregate statistics at the national or provincial level hides significant distributional impact, which is revealed in disaggregated data. Statistical analysis of the data from 78 districts of Pakistan reveals that some districts have achieved high level of capabilities, very low mortality rate and high literacy rate accompanied by low poverty and large public provision of social services. One example of it is 'Islamabad', the capital of Pakistan. But some districts have been left far behind such as 'Layyah'- a district in rural Punjab. The variation in these indicators across the district within a province and differences

across the provinces is an indicative of regional disparities in quality of life. The ranking of these variables by district is given in appendix 1 table 1.

Here we discuss the cases with superior health achievers with IMR, 32 per 1000 live births and poor health achiever with IMR 90 infant deaths per 1000 live births. Comparison of the rank of IMR and rank of other socio economic indicators in urban areas reveals that district with low mortality rate have high per capita income, high literacy rates, and large public provision of health and education facilities. But 'Kalat' a district in Balochistan shows very low mortality rate with low income per capita and high incidence of poverty. Here, low IMR that can be attributed the provision of health facilities, which are high as compared to other districts. On the other hand, poor health achievers in the urban areas like 'Vehari', show that they have low per capita income with large population below poverty line but literacy rate is not very low that can be attributed to larger facilities of public provision of education in urban areas. Here it seems that the only constraint to their welfare is income.

In the rural areas, districts 'Sheikhupura', 'Peshawar' and 'Sibi' show achievements level equal to the urban areas. But the results are hard to explain. First two districts show low per capita income, high absolute poverty, and poor public provisions, we cannot explain the reason of such a low mortality rates. This may be due to data misreporting. Sibi shows, low IMR with high per capita income and large provision of social services. In rural Sargodha, the sewerage and tap water facilities seem to be the major problem. High mortality rate in Muzaffargarh and Bahawalnagar can be explained by a number of factors. They have very low per capita income, very high absolute poverty and very poor water supply and sewerage system. On the other hand Sheikhupura and Gujranwala have high per capita income, but poor public provision of social services. It is also clear from the table 1 in appendix 1 of district ranking that literacy rates are low in rural areas compared to literacy rate in the urban areas. A general conclusion from the table can be drawn that location matters for poverty reduction strategy.

Table 2 in Appendix 1 reports descriptive statistics for provinces of various indicators; such as infant mortality rate, literacy rate (total), female literacy rate, mother's education, poverty and inequality along with various measures of public provision of social services. Table shows that there is considerable variation within and across provinces. The variation between provinces and within a province is an indication of regional disparities, in terms of income poverty as well as in terms of human poverty or deprivation, which is revealed by health facilities, education facilities, and availability of clean water and sanitation facilities. The data show that

some groups of population especially living in remote areas have been left behind. The table also reveals that role of public provision in the area of education and health can play important role to help households in these areas. If we compare results across province in urban areas, a wide disparity across the districts is evident from the aggregates of individual capabilities as well as from income based poverty e.g. infant mortality rate (IMR) is 32 per thousand live births in Islamabad compared to 98 per 1000 live births in Sargodha. Literacy rate is very high in Islamabad, 91.3 per cent and very low in Layyah, 20.per cent. Attock is very rich with only 12.5 percent of its population below poverty line, while Layyah is a very poor, with 91 per cent of its population consuming less than the income required to fulfill individuals' basic needs.

On the other hand, in urban areas the highest incidence of poverty in terms of income is in NWFP, 58.7 % population below poverty line but in terms of capabilities development, it is in Punjab, 98 infant deaths per thousand live births. With reference to literacy rate, it is lowest in Sindh with 67.9 percent literacy rate and highest in Balochistan with 41.9 percent literacy. Excluding Balochistan (it seems to be an outlier), results show that per capita income is highest in Sindh and lowest in NWFP.

The results of poverty and per capita income indicate that larger inequality in Punjab that is reflected in median of Gini coefficients, 0.4 for districts of Punjab. Maximum inequality is also in one district of Punjab, i.e., 0.6. Table shows that there is considerable variation within the province of Punjab. Highest and lowest literacy rates are in the districts of Punjab that again indicate high inequality in social indicators in Punjab that is also an indication of inequality of public provision of social services in the area of education in Punjab. While large disparity exists in the area of health in Sindh, which is reflected in population per health units and population per bed. The composite index of supply of tap water, garbage collection and sanitation facilities is lowest in Balochistan. It also shows largest disparities within Balochistan.

A comparison of the results, presented in table 2 for rural areas shows that the highest incidence of income based poverty and capability poverty measured by IMR is still in districts of Punjab. On the other hand, the richest district with highest per capita income is also in Punjab. The results of poverty and per capita income indicate that larger inequality in rural Punjab that is reflected in Gini coefficient, 0.6. High disparity in literacy rate and health facilities occurs in Sindh with relatively larger standard deviation.

The composite index of supply of tap water, garbage collection and sanitation facilities indicates lowest facilities in Punjab and Sindh. But largest disparities in the provision of these services exist in Sindh. These results may be biased in the absence of significant representation

from Balochistan.

Over all results reveal that lower IMR is seen in the districts with more equal distribution of income, with greater access to education, and other social services. Wider inequality with respect to poverty and inequality in terms of income as well as in terms of capabilities occurs in districts of Punjab. But inequality in public provision of water and sanitation facilities is higher in Balochistan and rural areas of Sindh and inequality in public provision of health services is higher among the districts of rural NWFP. From this government can deduce the targeted areas for specific investment such as in health, education and sanitation facilities and develop a effective poverty reduction strategy.

B. Results of the Basic Need Model

A non-linear transformation of IMR- $\log(\text{IMR}-5)$, a measure the proportionate gap between the actual and the desired level- is regressed against the log of mean income across 78 districts. The results from Equation-1 are presented in column one of table 1. The results show that one percent rise in per capita income of households reduces IMR by 0.6 percent. The result suggests that higher the per capita income of a district, the more likely it is that its population would be healthy and able to enjoy a full, long, and healthy life. This result indicates that the constraints on mortality decline are those of material resources. Therefore, economic growth is a key to human development and should be focused to promote human development in poor districts of Pakistan. But question is: does the relationship co-exist with poverty and public provision variables?

At the next stage, the relationship between income and capability development is empirically tested controlling either for the incidence of absolute poverty measured by the head count ratio or by the public provision of social services. First equation is extended by including log of poverty index (head count ratio) in equation 1 on the right hand side. The results reveal that the relationship between per capita income and capabilities development vanishes when we control for poverty (see equation 2 in column 2 of table 1). The coefficient of $\log(Y_{\text{HPC}})$, in fact reverses the sign and it cease to be significantly different from zero. Thus, it is concluded that it not growth in income that is important but reduction in poverty that should be focused to achieve the goal of capabilities development. Social out come can only be improved significantly if income poverty is reduced.

The next question is: Does this relationship persists after inclusion of public provision of

social services? The model is extended to explore the answer to this crucial question by including indicators developed in previous section for public provision of social services; population per health units. After inclusion of this variable, the relationship between ‘IMR and income’ and ‘IMR and poverty’ vanishes. The results of this equation suggest that the public provision is the main force behind capability development in Pakistan¹⁵. Sri Lanka is a good example of it, which has followed this rout and achieved remarkable improvement in social outcome (Annad and Ravallion, 1993)

At the second stage other indices of public provision such as covered sanitation facilities and availability of tap water are also included in the equation. The results show that as percentage of population using covered sanitation facilities rises, infant mortality rate falls. This again indicates the importance of public provision in the satisfaction of basic needs. The role of female education is often found to be a significant variable to raise welfare of household. Boehmer and Williamson, 1996. showed that female status “the control over resources” significant mediating variable. However, in this study, female education comes out insignificant. It is an indication of disempowerment of women and low status of women in Pakistan. Hobcraft *et al* (1984, 1985) and recent work by Desai and Alva (1998) also found that this variable is significant for few countries. However, this needs to be explored further.

Table 1
Results of ‘Basic Need Policy Model’

Variables	Ln(IMR-5) Equation 1	Ln(IMR-5) Equation 2	Ln(IMR-5) Equation 3	Ln(IMR-5) Equation 4	Ln(IMR-5) Equation 5	Ln(100-LR) Equation 6	Ln(100-LR) Equation 7	Ln(Population /Health Unit) Equation 8	Ln(No of Primary Schools) Equation 9	Ln(POV) Equation 10
Constant	9.51 (5.01)	0.22 (0.11)	-5.08 (0.48)	3.80 (4.07)	1.82 (2.74)	21.32 (4.81)	6.2 (4.89)	42.4 (4.32)	-7.92 (2.11)	6.50 (7.71)
Ln(Y _{IPC})	-0.62 (2.90)	0.14 (0.98)	0.58 (0.66)	-0.07 (-0.71)		-1.95 (4.44)	-0.09 (0.59)	-3.64 (3.33)	1.49 (3.56)	-0.4 (5.09)
Ln(Pov)		0.61 (3.07)	0.72 (1.10)		0.33 (2.37)					
Ln(No of Primary Schools)							-0.49 (3.79)			
Ln(POP/ School)							-0.22 (3.0)			
Ln(POP/ Health Unit)			0.08 (2.35)	0.07 (2.22)	0.06 (2.07)					
CSEWI				-0.004 (2.26)	0.004 (0.8)					
Ln(Female Literacy Rate)				-0.04 (0.76)	0.05 (0.96)					
Ln (IMR-5)							0.20 (1.4)			0.33 (3.63)
Ln(Mothers Education)										-0.19 (3.14)
F-Statistic	8.7	8.08	6.11	5.7	7.6	16.11	9.84	11.06	12.67	31.94
R ²	0.09	0.16	0.16	0.20	0.26	0.16	0.31	0.12	0.13	0.55

¹⁵ Some countries like Sri Lanka has followed this rout and achieved remarkable improvement in social outcome(Annad and Ravallion, 1993)

- Head count
- Value in Parentheses are t-statistics
- CSEWI Index for covered sewerage system

The results may not be generalized to other indicators of human development such as literacy rate. A similar test is applied to literacy rate. The results are similar to the results with IMR. The results show that income per capita affect literacy rate very significantly, one percent increase in mean income of district reduce the proportionate gap between desired level (100 %) and the actual literacy rate prevailing in that district by two percent. But after inclusion of quantity and quality variables of public provision measured by number of primary schools and primary school age population per schools, respectively, the relationship between LR and per capita income of district disappears.

The coefficients of quantity as well as quality variables are significantly different from zero [Table 1]. The results again confirm that the public provision is the main force behind capability development in Pakistan. It also shows that not only quantity but quality of public provision is also important in determining the level of human development. Mothers education, is statistically significant variable, that can be attributed to the fact that literacy rate also include educated women. Although, results show that direct impact of income on human development disappears in presence of public provision of social services. But the question is; Are the provision of social services sustainable in the absence of growth? The case of Sri Lanka shows that it is not sustainable without growth, while South Korea is a good example of growth oriented policies. In this study this is tested by estimating more equations. Assuming that higher income per capita of a district implies that it contributes more to overall growth of the country; indices for public provisions are regressed on per capita income of districts. The results suggest that income does affect human development through indirect channel, affecting public provisioning of social services positively. The result is confirmed by the equation for public provision of health services as well as by the equation for public provision of basic education. For a sustainable development this is a necessary condition.

Earlier results suggest that public assistance promote human development, independent of what is happening to incomes. But these results confirm presence of indirect impact of income on capabilities development. It provides resources to government for investment. From this we can conclude that growth is necessary if not sufficient condition for capabilities development.

Last, equation is estimated to show the route to reduce income poverty in Pakistan. The equation is estimated with poverty as a dependent variable and capabilities, income and

mothers education as explanatory variables. The coefficient of income per capita is very strong leading to the view that increase in income per capita lead to lower absolute poverty. Capability development also affects poverty negatively and significantly. From this it can be concluded that human poverty is a cause of income poverty not the result. This result confirms Hicks (1979) argument that satisfaction of basic needs raise productivity.

V. Conclusions

The study shows that a district wise analysis is important to provide an insight to the role of private income and public provision of social services in poverty change analysis for effective poverty reduction strategy. First it compares descriptive statistics of socio-economic indicators across the districts of Pakistan. The major conclusion drawn from this analysis is that aggregate statistics at the national or provincial level hides region specific reasons of poverty and inequalities. The results reveal that some districts have achieved high level of capabilities with very low mortality rate and high literacy rate accompanied by low poverty and large public provision of social services; Islamabad-the capital of Pakistan. But some districts have been left far behind such as 'Layyah'- a district in rural Punjab. The variations in these indicators across the districts within a province and across the provinces are an indicative of regional disparities in terms of income, health, education, and the quality of life that can be helpful for effective poverty reduction strategy at the district level. The results show that inequality in public provision of water and sanitation facilities is higher in Balochistan and the rural areas of Sindh. Whereas inequality in the public provision of health services is higher among the districts of rural NWFP. From this government can deduce the targeted areas to start area-specific program to reduce poverty and capabilities development.

The results of basic need policy model show that relationship between the capabilities and the income vanishes, when indicators for the public provision of social services are included in the equations. Exclusion of population from these opportunities exacerbates poverty not only in terms of capabilities but also in terms of income. Therefore, government should heed to improvements in the health, education, and sanitation facilities. The results also suggest that the ultimate constraints on the capability development are those of material resources. From this it can be concluded that growth is a necessary condition for human development though not sufficient. The facilities can be achieved through improved and redirected public expenditure immediately to fill the gap between the actual and the desired

level.

The study concludes that public spending directed to social sector programs would help to reduce poverty effectively. However, growth is necessary for sustainable public provision of social services. Government should design its anti poverty strategy taking full consideration of region specific deprivations. Otherwise, poverty will continue to linger if not worsen.

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Appendix 1: Table 1: Ranking of Different Socio Economic Indicators by District in Pakistan

Districts	Poverty	IMR	Gini	Mean Income	Literacy	Female Literacy	Population per health unit	Population per school	Sewerage	Tap water
Punjab Urban										
Attock	1	11	5	73	73	72	15	22	46	58
Rawalpindi	3	2	10	70	74	75	26	33	45	55
Jhelum	56	27	34	45	60	56	16	18	24	48
Islamabad	2	1	26	72	76	77	10	33	50	58
Mianwali	43	16	2	38	33	15	17	12	42	38
Khushab	26	29	25	36	55	52	14	30	17	53
Bahkar	63	25	12	19	42	21	18	8	20	1
Lahore	7	12	3	75	75	76	30	41	48	57
Kasur	25	23	21	50	50	53	28	25	27	22
Sheikhupura	46	41	21	48	54	61	22	31	31	35
Gujranwala	24	31	3	51	58	68	42	36	34	11
Gujrat	8	20	26	76	65	70	19	23	1	7
Sialkot	15	30	22	63	70	73	24	27	29	44
Faisalabad	11	19	32	74	44	51	38	38	26	23
Toba Tek Singh	23	26	25	68	51	65	2	17	25	52
Multan	35	21	9	49	26	49	32	35	43	21
Vehari	59	50	9	16	47	47	6	21	35	40
Sahiwal	20	9	14	57	59	57	20	5	41	33
DGKhan	67	17	21	13	72	74	13	19	1	42
Layyah	67	37	8	35	4	1	7	7	18	19
Muzaffargarh	21	19	19	46	54	45	27	26	47	1
Rajanpur	37	24	4	52	68	60	8	1	1	12
Bahawalpur	31	23	13	55	67	71	36	13	40	1
RahimYarKhan	66	32	15	12	45	54	23	29	37	32
Punjab Rural										
Attock	40	31	17	28	39	35	65	73	1	1
Rawalpindi	39	20	24	25	52	48	48	68	10	31
Jhelum	58	38	31	15	53	46	54	58	13	30
Islamabad	41	15	20	18	69	64	46	48	26	1
Sargodha	22	53	38	27	29	37	51	51	1	24
Khushab	41	44	9	34	19	25	59	53	1	41
Bahkar	21	50	11	30	36	13	72	39	1	1
Lahore	41	33	37	69	28	32	52	64	1	25
Kasur	54	37	27	17	31	31	58	59	1	1
Sheikhupura	38	51	28	43	19	28	53	55	14	16
Gujranwala	53	50	36	54	30	42	67	77	8	3
Gujrat	50	35	27	8	40	45	62	76	3	1
Sialkot	32	36	18	32	49	55	71	74	1	6
Faisalabad	52	28	21	21	22	30	76	57	2	14
Jhang	47	34	30	26	16	16	75	54	5	15
Multan	41	43	39	77	20	22	56	63	9	10
Vehari	51	50	27	24	21	26	68	66	15	5
Sahiwal	65	39	40	78	17	27	60	72	4	13
DGKhan	69	27	12	3	38	39	61	61	1	9
Layyah	71	42	13	2	15	20	50	65	1	47
Muzaffargarh	68	51	16	6	8	9	78	56	6	8
Bahawalpur	33	40	19	31	14	29	70	60	1	4
Bahawalnagar	49	52	13	10	13	36	64	71	1	27
RahimYarKhan	56	44	23	11	12	19	74	62	12	20
Sindh Urban										
Khairpur	30	7	7	42	61	59	33	15	32	17
Nawabshaw	12	13	3	56	57	50	34	14	30	37
Dadu	18	1	7	60	71	62	31	9	49	46
Hyderabad	5	6	1	64	62	67	43	24	44	54
Karachi all	4	5	17	71	66	69	69	40	50	56
Sindh Rural										
Karachi all	16	8	20	65	25	17	29	37	36	50
Shikarpur	60	1	12	20	46	38	57	52	1	2
Nawabshaw	19	10	17	40	3	3	47	46	1	1
Hyderabad	13	14	6	47	5	11	55	47	1	1
Badin	14	7	14	41	9	8	66	50	1	8

Thatta	27	3	22	53	34	18	44	45	19	1
NWFP Urban										
Swat	34	4	12	37	37	44	12	16	23	34
Manshra	45	3	18	44	64	63	3	4	39	45
Abbotabad	17	10	13	59	63	66	11	11	38	51
Mardan	61	10	10	23	41	34	25	28	1	26
Peshawar	29	5	23	58	43	33	21	32	21	43
DIKhan	9	2	13	62	56	58	9	2	33	36
Bannu	42	21	30	22	32	41	35	3	28	58
Lower Dir	57	27	36	29	11	6	63	69	1	49
NWFP Rural										
Swat	62	22	35	9	27	23	77	70	7	29
Mardan	64	7	39	39	35	40	49	67	1	27
Peshawar	48	1	21	14	18	14	73	75	1	18
Kohat	55	18	33	1	6	5	45	49	1	39
Kark	56	20	29	4	23	24	39	42	1	41
DIKhan	70	28	16	5	1	2	41	34	1	58
Balochistan Urban										
Sibi	10	1	29	67	48	43	1	6	16	58
Kalat	36	1	23	33	24	10	4	20	1	1
Makran	6	10	18	66	10	12	5	10	22	58
Balochistan Rural										
Sibi	28	1	16	61	7	7	37	43	11	28
Kalat	44	43	23	7	2	4	40	44	1	15

Table 2
Regional Difference in Selected Socio-Economic Indicators

	Districts in Urban Area by Province															
	PUNJAB				SINDH				NWFP				BALOCHISTAN			
Count	Max	Min	Med	Std.Dev	Max	Min	Med	Std.Dev	Max	Min	Med	Std.Dev	Max	Min	Med	Std.Dev
Poverty	87.5	12.5	53.8	22.7	56.0	19.3	35.7	14.9	79.5	31.3	58.7	16.4	61.1	25.0	34.5	18.7
Income per Capita	20151.2	5322.6	8527.3	4668.5	16093.5	7675.7	9482.0	3267.6	10504.6	5705.4	7905.4	1876.7	13622.8	6833.0	13170.4	3796.2
Infant Mortality Rate	90.0	32.0	58.0	13.7	46.0	32.0	39.0	5.0	55.0	34.0	38.0	7.1	43.0	32.0	32.0	6.4
Literacy Rate Of District	91.3	20.0	64.7	15.9	78.0	65.9	67.9	4.9	71.2	45.5	51.5	10.8	54.2	28.0	41.9	13.1
Father Education	10.8	1.6	5.7	2.4	10.2	5.8	6.5	1.8	6.2	3.2	5.1	1.0	4.9	0.3	1.3	2.4
Mother Education	9.0	0.0	4.0	2.3	6.8	2.5	5.4	1.6	5.3	1.7	2.9	1.3	2.7	1.0	1.0	1.0
GINI	0.6	0.2	0.4	0.1	0.4	0.2	0.3	0.1	0.5	0.3	0.3	0.1	0.5	0.4	0.4	0.1
Population	3087.1	34.1	251.7	748.2	4227.9	131.9	360.7	1740.7	841.0	29.5	83.1	289.5	96.2	67.0	84.2	14.6
Population per Health units	30.2	0.94	4.67	6.9	82.60	103.1	16.6	30.1	17.9	0.98	2.8	5.8	1.7	0.63	1.62	0.58
Population per bed	2249.0	217.7	746.0	454.0	3018.4	376.0	741.3	1057.1	989.0	79.1	292.4	301.9	1711.7	456.5	1019.2	628.7
TAPWATER	101.0	0.0	60.4	35.9	97.7	22.4	82.9	30.9	100.0	40.6	76.5	20.2	100.0	0.0	100.0	57.7
Garbage Collection	101.0	13.7	75.5	28.7	101.0	48.2	78.6	22.3	94.2	24.9	64.9	23.9	80.8	4.7	40.6	38.1
Covered Sanitation	100.0	0.0	39.3	32.0	101.0	32.5	81.2	32.2	65.1	1.0	28.3	21.7	24.5	1.0	12.6	11.8
Composite Public Policy Index for water and Sanitation facilities	101.0	10.2	59.9	20.0	94.0	51.3	87.2	20.1	76.8	36.6	61.4	14.6	73.7	0.0	59.0	38.4
	District in Rural Area by Province															
	PUNJAB				SINDH				NWFP				BALOCHISTAN			
Poverty	91.4	50.0	70.0	10.8	78.9	36.4	45.4	16.1	89.4	69.5	75.5	6.5	67.8	55.0	61.4	9.1
Income per Capita	43832.7	3583.3	6243.2	8628.4	11147.7	5634.2	7799.3	1814.8	7405.4	3448.1	5149.5	1399.9	9793.0	4826.8	7309.9	3511.6
Infant Mortality Rate	98.0	49.0	78.5	13.0	47.0	32.0	40.5	5.3	64.0	32.0	54.0	11.8	88.0	32.0	60.0	39.6
Literacy Rate Of District	76.5	24.1	41.2	10.8	53.1	16.3	33.7	14.9	47.2	12.9	38.3	12.1	23.9	15.3	19.6	6.1
Father Education	6.8	1.8	3.4	1.3	4.4	1.3	2.6	1.5	3.8	1.3	2.8	1.0	2.8	0.0	1.9	1.3
Mother Education	3.6	0.0	1.8	0.7	1.7	1.1	1.4	0.3	2.3	0.0	1.4	0.4	1.1	0.0	1.1	0.1
GINI	0.9	0.3	0.4	0.2	0.4	0.3	0.4	0.1	0.7	0.4	0.6	0.1	0.4	0.4	0.4	0.0
Population*	2771.6	115.6	1326.5	682.3	1231.1	165.6	516.9	356.3	2084.2	169.0	1126.0	728.4	616.9	615.9	616.4	0.7
Population per Health units*	255.0	46.0	64.3	44.5	73.1	8.3	53.1	22.9	154.8	23.7	53.0	49.6	25.9	18.7	22.3	5.1
Population per bed	29.0	2.5	7.9	5.7	25.0	1.3	10.3	8.6	1732.0	6.2	115.8	686.8	4.8	3.5	4.2	0.93
TAPWATER	83.1	0.0	13.0	22.8	89.1	0.0	2.1	35.3	101.0	25.8	64.9	26.3	45.3	17.7	31.5	19.5
Garbage Collection	18.6	0.0	0.0	5.7	60.8	0.0	7.9	23.4	85.2	0.0	19.7	30.0	1.0	1.0	1.0	0.0
Covered Sanitation	26.0	0.0	2.0	5.8	50.8	0.0	0.0	20.0	3.6	0.0	0.0	0.0	8.7	0.0	4.9	5.4
Composite Public Policy Index for water and Sanitation facilities	29.1	0.0	13.0	7.0	49.2	0.0	10.5	17.7	39.1	20.0	30.4	6.9	18.3	6.6	12.5	8.3