Incidence of Government Expenditure on Education in Pakistan

Amanat Ali[*]
Muhammad Akram[*]

Abstract

This study analyses the incidence of the government expenditure on education in Pakistan at regional and provincial level, using the latest data of Pakistan Social Standard Living Measures Survey (PSLM) 2004-05 and by employing the Three-step methodology. The inequalities in the benefits of these expenditures exist at regional and provincial level. The rural areas are more disadvantaged groups in the provision of the education facilities. The expenditures in education sectors are overall progressive in Pakistan while it is regressive in technical education sectors in NWFP. All other sectors are progressive at provincial and regional levels. However variation in shares of different income groups in public expenditures benefits in the provision of education facilities exist.

Intoduction:

According to Economic Survey of Pakistan 2005-06, Pakistan is spending 2.1 percent of GDP on education. Currently adult literacy rate is 53 percent, which is below the target of the PRSP that was 58 percent for 2004-05. A significant gender gap persists at all levels of enrollments especially in rural areas. Overall male literacy rate is 65 percent while for females it is 40 percent. In rural areas female literacy rate is 29% while in urban areas it is 62 percent. Females are considered among more disadvantaged groups as far as the literacy rate is concerned at the provincial level. In Balochistan female literacy rate is lowest at 19% and it is even worst in rural Balochistan that is 13% while highest in Punjab that is 44% and for males literacy rate ranges from 58% to 65% at provincial level.

The same survey also explains that in Pakistan in 2005-06 the role of private sector in education sector has increased tremendously over time. The total primary level gross enrollment rate (GER) is 86 percent in 2004-05. Out of which the government schools' GER is 62 percent and remaining 38 percent GER belong to the private sector. Literacy and primary school enrolment rates in Pakistan are low as compared to the other countries of the region. According to the Education for All (EFA) Global monitoring reports (2005) Pakistan is among those 37 countries whose Education for all Development Index (EDA) is below 0.8. EDA ranges from 0 to 1 and its closer to 1 value means closer the country in meeting its goals. According to this report about 800 million adults were illiterate in 2002. About 70 % of them are living in nine countries of Sub-Saharan Africa and East and South Asia, notably India, China, Bangladesh and Pakistan.

Economic literature is quite clear that education is the key determinant of the human capital. As better education enhances the skills of labor force that will ultimately, contribute to economic growth of the country. Governments therefore try to subsidize education in order to achieve better, more skilled, efficient and productive human capital. Governments bear whole or some part of the cost of education. The size and distribution of these expenditures vary from country to country. The central question is regarding the impact of productivity and effectiveness of these expenditures. It depends on the volume and the distribution of these expenditures among the people of different areas of the country. Bearing in mind the current situation of the human resources, any marginal change in government expenditures on these services may positively contribute to high expenditure incidence at different levels of income and geographical areas etc.

[*] Lecturer and Ph D Student at Department of Economics Quaid-I-Azam University Islamabad, Pakistan
E-mail: amanat@qau.edu.pk.

[*] Ph D Student at Department of Economics Quaid-I-Azam University Islamabad, Pakistan
E-mail: makram2341@gmail.com

Microeconomic studies repeatedly confirm the positive impact of education on economic performance. Education yields the highest economic benefits where there are pro-poor[1] policies and effective demand for educated manpower. Education for All (EFA) Global monitoring reports (2005), ESCAP (2003), Gupta et al (2002) and Roberts (2003) argue that better education contributes to higher lifetime earnings and more robust national economic growth. According to Christian (2002) improvement in education and health outcome is sought because of their intrinsic value in raising capabilities and individual freedoms. Both have instrumental value in contributing to higher incomes and reinforcing each other. Education is critical to preserving and enhancing the quality of labor and for this reason investment in education is especially important for the poor, as the labor is the main asset of the poor.

Expenditure on education in developing countries, relative to their GDP, has increased slowly and erratically since 1970. It varies widely between countries and bears no strong relationship to primary enrolment and completion rates. Flug et al (1998) shows government expenditures have positive but insignificant impact on enrollments. Using recent cross-country data, Roberts (2003) suggests that two-thirds of the inter-country variance in primary completion rates and nearly half of the variance in gross enrolment rates are explained by demand-side factors such as adult literacy and per capita income.

Discrimination by race, gender, caste, region and minority status leads to some sections of the population having less access to publicly provided services. Public expenditure benefit incidences are skewed against such groups since their service utilization rates are lower than privileged groups. Samer, (2002) for Malawi, Sabir (2003) for Pakistan, Shahin (2001) for Côte d'Ivoire and Selden (1992) for Peru found that females of school age as a group received fewer benefits than that of male counterpart. Jorge (2001) using the benefit incidence approach to analyze the incidence of expenditure concluded that average benefits for females are quite a bit smaller than males. Classification by ethnic groups may show disadvantaged status of ethnic minorities.

"The conventional wisdom of the benefit incidence literature is that spending on primary education is the most progressive item in developing countries' public sector budgets, particularly if spending is targeted to rural areas"[2]. Focusing on the incidence of the public expenditure in education and health for Mozambique, Rasmus *et al* (2001) has estimated that the poorest quintile receives 14 percent of total education spending; the poorest half receives 36 percent of public spending in the education sector, while the richest quintile receives 33 percent.

How government expenditures impact different groups depends among other things on the composition of the public expenditures. What programs are being implemented and how much funding is going to each such as basic education versus university level education? David (2000) examines the social sector expenditures in eight sub-Saharan African countries; Demery (1994) analyzes education expenditure in Kenya and Younger (1999) studies the incidence impact of education expenditure in Ecuador. Results demonstrate that primary education is the most progressive, followed by secondary education, public universities and finally private universities. Public spending improves the education indicators in the developing countries. Gupta *et al* (2002) using the cross-sectional data of 56 countries, shows that increase in public expenditure on education is associated with improvement in both access to and attainment in school. Reviewing the incidence of the public expenditure in education that is arguably the main fiscal vehicle for improving the welfare of the poor in Mozambique, Rasmus *et al* (2001) and Jorge (2001) have shown that access to primary education is more equal than any other level of education.

Using benefit incidence analysis (BIA) approach to measure inequalities in benefits of public expenditures on education, Norman (1985), Sakellariou (2004) analyzed the equity effects of public subsidization of private schools in Côte d'Ivoire. Hamid *et al* (2003) has shown the evidence of substantial cross-country heterogeneity. They concluded that government expenditure on education benefits upper income more than the lower income groups. Only 16 percent of benefits accrue to the poorest quintile. In contrast, the richest quintile receives about 27 percent of benefits, more than its share in the population. There is little evidence, however, of middle-class capture; on average, the middle 60 percent of the population distribution receives about 58 percent of the total benefits.

Studies have found that the social rate of the return is highest on primary education followed by secondary and tertiary education. (Pascharropolous, 1994 &World Bank, 1995). At the same time evidence suggests that spending

[1] Pro-poor policies are those policies, which benefit more the poor. Pro-poor growth is growth whose benefits trickle down to the poor.
[2] Rasmus *et al* (2001)

on tertiary education in many countries is excessively high (see for example, Sahn 1993; Gupta *et al,* 1998, World Bank, 1995). Lanjouw (1999) have argued, using data from rural India, that marginal spending affects the poor more than average spending because when programs are expanded or reduced the composition of beneficiaries tends to change.

Sabir (2003) has analyzed the education expenditures in Pakistan and concluded that the government subsidies directed toward primary education are pro-poor in all four provinces of Pakistan. Moreover females are disadvantaged in access to primary education. Government subsidies directed towards higher education are poorly targeted and poorest income group receive less than richest income group and indeed favor those who are better off. Husain *et al* (2003) concluded that in Pakistan there are no disparities in allocation of funds to education sector between districts. Further they said that economic growth is necessary but sufficient condition for the human development.

In Pakistan two studies have been done on the incidence of the public expenditure. One has used the primary household data for the incidence of public expenditures in education only and the other has used secondary data just the averages of the expenditures for the incidence analysis. The earlier literature like Sabir (2003) and Husain (2003) *et al* are based on old HIES surveys. This study will explain the nature of incidence of public expenditures on education using latest household survey data.

Methodology and Data

In estimation of public expenditure, generally there are two approaches that have been widely used. The first approach is known as the benefit incidence approach. This approach uses the estimated input costs or marginal costs of provision as the measure for marginal benefits. The second approach is known as the behavioral approach. This approach uses econometric techniques to estimate behavioral demand for publicly provided private goods, which then can be used to derive willingness to pay.

The Benefit Incidence Approach

The benefit incidence approach is called the classic approach or non-behavioral approach, which was pioneered by twin world bank studies conducted by Selowasky (1979), Meerman (1979) and Sakellariou (2004) have used this approach to analyze incidence of public support to the private education sector in Cote d Ivoire. Castro-Leal *et al* (2000) have used this methodology to analyze public spending on health care in Africa. Jorge (2001) applied it to measure the impact of budgets on the poor.

The purpose of benefit incidence is to analyze and to identify who benefits from the public spending and how much. The benefits incidence measures how much the income of a household would have to be raised if the household had to pay for the subsidized public services at full cost. The beauty of this approach is that it uses the information of cost of the publicly provided goods and services taking into consideration the uses of goods and services by the different income groups and finally finds out the estimates of the distribution of benefits. The process is that the individual beneficiaries are grouped by their income level, but they can also be grouped by geographical area, ethnic group urban and rural location, gender and so on. In analyzing the incidence of public expenditures on education in Pakistan this grouping has been made on the basis of income.

Information on individual or household utilization of public services is obtained from household surveys, published by Bureau of Statistics, Government of Pakistan. The latest survey named Pakistan Social and Living Standards Measurement Survey (PSLM) (Round-1) 2004-05. We have calculated the net subsidy to house hold by subtracting the fee any individual is paying for the use of services from the total expenditure which a government is spending to provide him this service. These expenditures are found by multiplying cost of provision of that service in the area in which the individual resides by the time he uses that service. Then, this net subsidy is used to analyze the inequalities in benefits of the public expenditures.

In practice the conduct of incidence analysis generally involves three steps. These steps are as under:

1- Obtain the estimates of the unit cost or subsidy implied by the provision of a particular public service. Data for this step usually comes from public expenditure accounts. For example, budget data on per student cost or subsidy by level of schooling.
2- Impute the subsidies to individual or household identified as user of the service by using information available on use by different income groups. For example enrollment rates in public schools across population deciles ordered by income level ranging from poor to rich or clinic visits as reported by different households in consumer expenditure surveys.
3- Aggregate individuals or households in groups ordered by income or expenditure or any other grouping of interests such as race or gender, distribute the benefits among the different groups and arrive at an estimate of the incidence of per capita subsidies accruing to each group[3].

In this study we have tried to explore the answers of the following questions:

1- Are government expenditures in education progressive in Pakistan?
2- Do large inequalities exist in the distribution of government expenditure among the different sectors or levels of the education in Pakistan as a whole and at provincial and regional (urban and rural) level?

Data used in this study has been taken from the following sources.

1- The information on the use of the publicly provided education services, income of the household and the individual expenditures on education have been obtained from Pakistan Social and Living Standards Measurement Survey (Round -1) 2004-05, Federal Statistics Division Government of Pakistan
2- The data on enrollments in different educational institutions have been taken from Pakistan Education Statistics 2004-05, Ministry of Education Pakistan.
3- Total expenditures on education in Sindh data is taken from Budget 2006-07, Vol. III, Current Expenditure on Education & Health "Finance Department, Government of Sindh"
4- Total expenditures in education in Punjab data is taken from Estimate of Charged Expenditure and Demand for Grants (Current Expenditure) Vol.I (Fund No. PC 21016-PC 21016) 2006-07
5- Total expenditures on education in NWFP data is taken from Demand For Grants Current Expenditure For 2006-07, Education Vol.III, (PART-A) Provincial "Government of NWFP" Finance Department
6- Total expenditures on education in Balochistan data is taken from Demand For Grants and Current Expenditure (New Accounting) For the Year 2006-07, Education Vol.III-A) Provincial "Government of Balochistan" Finance Department
7- Total expenditures on education in Pakistan data is taken from Demand For Grants and Appropriations 2006-07 "Government of Pakistan" Finance Division Islamabad
8- For the distribution of the total expenditures in different sectors of education the percentage distribution has been taken from PRSP, Annual progress Report FY 2004-06, PRSP Secretariat, Finance Division Government of Pakistan September 2005

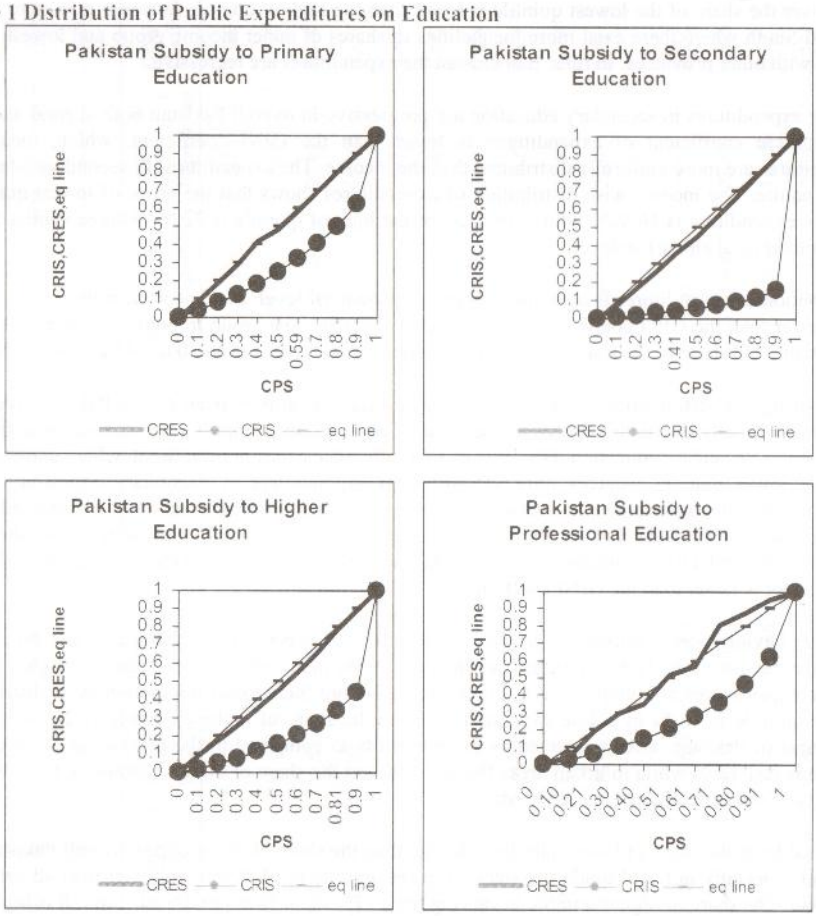
Results and Discussion

Net government subsidies going to a household have been calculated by deducting the total individual expenditures incurred on using an education service from the total per- household government expenditures in the provision of education service. Using this net subsidy the GINI and Concentration coefficients have been calculated to check the nature of the incidence of government expenditures on education. Theoretically, if the concentration coefficient is lower than the GINI coefficient then the expenditures on education are progressive or pro-poor and vice versa.

[3] For mathematical details see Appendix 1.

Net subsidies have been used to calculate the shares of different quintiles in the government expenditures on education to measure the inequalities in the expenditures shares of different quintiles. The graphical view of the distribution of expenditures in education at Pakistan level is shown in figure 1 below.

Figure 1 Distribution of Public Expenditures on Education



Graphical view of the distribution of government expenditures in overall Pakistan on education is shown in the figure 1. This figure shows that primary education expenditures are most equally distributed in Pakistan. For primary education the expenditures distributions line is overlapping the equality line in the figure 1. Professional education expenditures are absolute progressive while the secondary and the Higher education expenditures are weak progressive. It also asserts that there exist the variations in the shares of the different quintiles in public expenditures in education sector.

According to Economic Survey of Pakistan 2005-05, Pakistan is spending 2.1% of the GDP on education. It spends 42.18 % on Primary education, 23.46 % on secondary and 12.31 % of total expenditures on education on the higher education of the total expenditures in education and for our study results are reported in table 1 below.

Table 1 show that overall expenditure in the primary education is progressive except in rural Balochistan. The share of lower 20 % in the government expenditures in primary education is 19 % and the share of the highest 20% in primary education government expenditures is 23% in Balochistan. The 4 th and 5th columns in table 1

demonstrate here all the GINI coefficients are higher than the concentration[4] coefficient. This implies that the expenditures are more evenly distributed as compared to income distribution.

The share of lowest 20% poor people in public expenditures in primary education ranges from 17 to 20% while the share of the highest 20% people is ranging from 19 to 23 % in Pakistan. At Provincial level the share of lowest quintile and the highest quintile are almost same as in over all Pakistan and overall expenditures are progressive. Moreover the share of the lowest quintile is lower than the highest quintile however it is more skewed in Rural NWFP and Sindh where there exist more inequalities in shares of upper income group and lowest income group as compared with other provinces. In rural Balochistan the expenditures are regressive.

The public expenditures in secondary education are progressive in overall Pakistan both at rural and urban level. The concentration coefficient of expenditures is lesser than the GINI coefficient, which, means that government expenditures are more uniformly distributed than the income. The expenditures in secondary educations are pro-poor in its nature. The income wise distribution of expenditures shows that the share of lowest quintile in secondary education expenditure is 16.42% while the share of the highest quintile is 22 %. Almost similar kind of behavior prevails both at rural and urban level.

The distribution of expenditures is again progressive at provincial level. In all provinces the coefficients of concentration are lower than the GINI coefficients. The share of lower income group in public expenditures ranges from 17 % to 20% while the share of the share of the higher income group ranges from 20 to 24 % in all provinces.

The share of the poorest quintile is lower than the richest quintile at provincial and in Pakistan overall. In urban Punjab it is most equally distributed where the upper and lower income quintile receive equal benefits from the public expenditure in Secondary education. However as vast difference exists in rural Sindh where upper quintile receives 26% while lower quintile receives only 18% of total expenditures in Secondary education. Higher education expenditures are also progressive in overall Pakistan as well as at provincial level. The higher education expenditures are pro-poor in Pakistan that can be seen from the column 12^{th} and 13^{th} of table 1 that shows the concentration coefficients and GINI coefficients. At Pakistan and provincial level, both in rural and urban the concentration coefficient is lesser than the GINI coefficient.

The poor are having more opportunities to get access to the higher education as compared to their capacity to pay for it. This may be due to the fact that higher income group send their children abroad for the higher studies. Although the public expenditures are progressive in higher education but there exists a variation in its distribution. The share of lower quintile is 18 % in public expenditures while the share of highest quintile is 21 % in higher education expenditures in Pakistan. Urban areas enjoy more benefits as compared to the rural areas. In rural areas lower quintile share is just 12 % while in urban areas this is 17 % and the share of higher quintile is 13 % while in urban areas it is 20 % of the expenditures in higher education.

At provincial level the share of lower quintile is higher than the share of this group in overall Pakistan. It is highest in Sindh and especially in Rural Sindh the share of lower quintile is 34 % that is higher than all urban and rural areas in Pakistan. The share of higher quintile is varying from 17% to 24 % at provincial level. It is highest for rural Punjab and lowest for NWFP rural that is 15 % of the total expenditures in higher education.

Due to the unavailability of information on rural urban in overall Balochistan' analysis of the public expenditures on professional has not been calculated. Only provincial and overall Pakistan analysis has been made and reported in table 2.

[4] The concentration coefficient shows the inequalities in the distribution of the government expenditures. This is calculated in same as the GINI coefficient, which shows the income inequalities. Only the difference is that we calculate concentration coefficient keeping income group same. The concentration coefficient can lies in range of -1 and 1 while the GINI coefficient lies between 0and 1. If concentration coefficient is lower than GINI coefficient it shows that expenditures are more evenly distributed than income and vice versa.

Table 1: Distribution of Government Education Expenditure in 2005-06

Region	Primary Education				Secondary				Higher			
	Lower20 %Share in Expenditure	Upper20 %Share in Expenditure	GINI Coefficient	Concentration coefficient	Lower20 %Share in Expenditure	Upper 20% Share in Expenditure	GINI Coefficient	Concentration Coefficient	Lower20 % Share in Expenditure	Upper 20 % Share in Expenditure	GINI Coefficient	Concentration Coefficient
Punjab	18.688	19.97	0.333	0.013	17.635	21.22	0.389	0.039	16.148	23.226	0.389	0.091
Rural	18.802	19.945	0.312	0.02	17.623	23.689	0.341	0.061	17.579	23.632	0.316	0.061
Urban	20.563	20.563	0.354	0.006	19.652	19.735	0.402	0.002	16.228	22.451	0.309	0.09
Sindh	18.075	21.826	0.27	0.033	17.217	23.27	0.315	0.067	20.812	19.222	0.353	0.014
Rural	17.671	22.877	0.369	0.042	18.115	26.063	0.253	0.077	33.555	16.578	0.322	-0.127
Urban	19.2	19.6	0.266	0.015	17.373	20.109	0.317	0.029	17.813	19.406	0.342	0.035
NWFP	18.237	23.383	0.357	0.048	18.355	22.366	0.385	0.038	17.035	22.938	0.354	0.063
Rural	17.669	24.215	0.312	0.052	19.064	22.339	0.303	0.034	13.047	15.279	0.328	0.031
Urban	18.373	24.515	0.423	0.042	17.59	21.336	0.451	0.024	20.338	17.506	0.354	0.07
Balochistan	18.371	23.216	0.269	0.048	16.959	22.69	0.267	0.066	18.75	22.917	0.25	0.034
Rural	18.616	23.106	0.327	0.488	16.18	23.607	0.237	0.058	---	---	----	---
Urban	18.297	19.949	0.263	0.046	18.658	23.69	0.264	0.053	20	22.5	0.252	0.03
Pakistan	18.733	21.76	0.238	0.024	16.347	21.802	0.279	-0.022	17.906	21.502	0.363	0.059
Rural	18.495	21.585	0.293	0.029	16.418	22.565	0.305	0.067	11.594	13.026	0.32	0.025
Urban	19.955	21.721	0.337	0.029	16.5	20.306	0.377	0.037	16.741	20.683	0.362	0.06

Table: 2 Distribution of Government Education Expenditure in Professional Education in 2005-06				
Region	*Lower20 %Share in Expenditure*	*Upper20 %Share in Expenditure*	*GINI Coefficient*	*Concentration Coefficient*
Pakistan	19.066	12.471	0.419	0.067
Punjab	18.181	21.212	0.347	0.039
Sindh	19.047	19.047	0.408	0.006
NWFP	17.142	14.285	0.232	0.259
Balochistan	---	---	---	---

According to table 2 the public expenditures in professional education are pro-poor. The lower quintile share in these expenditures is 19 % while the upper quintile share is 12 %. As for the expenditures in technical education at provincial level is concerned these are progressive in all the provinces except the NWFP where it is regressive. It implies that public expenditures are pro-poor in Punjab, Sindh and while it is other way round in NWFP. The repressiveness of the public expenditures in technical education may be due to access problem to technical education institutions. Most of the technical institutes are based in cities where the poverty level is low and secondly most of the population lives in the rural areas where poverty level is high and these technical institutes are non-existent. The shares of lower quintile in technical education expenditures are in the range of 12 to 19 % while the share of higher quintile is in the range of 14 to 21%.

Conclusion

The hypothesis that education is progressive in Pakistan is largely accepted. The other hypothesis that there exist large inequalities in the shares of the different quintiles on education expenditures can not be rejected. The education expenditures in overall Pakistan as well as in all the provinces in Pakistan except primary education in rural Balochistan and professional education in NWFP are progressive in nature. Overall expenditures are more uniformly distributed as compared to the income distribution in Pakistan. However there exist large variations in the shares of the upper quintiles and the lower quintiles. The share of lower quintiles is lower than the share of upper quintiles in all the regions except higher education in Sindh and professional education in NWFP. The rural urban inequalities are more profound and the rural areas are more disadvantaged regions in education facilities.

Policy Implications

On the basis of our results following implications can be drawn and some policy recommendations may be proposed.

1. Inequalities in the shares of different quintiles in the benefits of government expenditures on education in Pakistan are vilely accepted. Inequality exists at provincial and regional level. Horizontal and vertical equity in allocation of the resources to education both at provincial and regional level can make the expenditure programs in education more effective and result oriented.

2. Reallocation of resources and reformulation of the education policy that target to benefit the poor more and improve the low income people access to these services is the need of the time and through this the education policy can make a huge difference.

3. Policy measures such as fee waiver, scholarships, cash transfers and in-kind transfer or any other public support may result in increase of subsidy to poor and will enhance the share of lower quintiles.

References

Christian, Morisson (2002): "Education and Health Expenditure, and Development: The Cases of Indonesia and Peru", *Development Centre Studies, OECD Report 2002*

Castro-Leal, F., J. Demery, & K. Mehra (2000): "Public Sp ending on Health care in Africa: Do the poor benefit?" *Bulletin of the World health Organization, 2000, Vol 78, No 1*

David. E. Sahn and Stephen D. Younger (2000): "Expenditure Incidence in Africa: Microeconomic Evidence " *Fiscal Studies (2000) Vol. 21, No. 3*

Demery, Lionel, and Verghis, Mathew *(1994):* "The Incidence of Education Expenditure in Kenya, Education and social policy department", *World Bank.*

ESCAP (2003): The Role of Public Expenditure in the provision of Education and Health, *Economic and Social Survey of Asia and the Pacific (ESCAP) (2003)*

Flug, K. Spilimbergo, A., Wachtenheim, E. (1998): "Investing in Education: Do Economic Volatility and Credit Constraints Matte r?" *Journal of Development Economics vol .55*

Global Monitoring Report (2005): Education for the entire Quality Imperative, *UNESCO 2005.*

Government of Pakistan (2006): Pakistan Social and Living Standards Measurement Survey, (Round-1) 2004-05, *Federal Bureau of Statistics, Islamabad.*

Government of Pakistan (2006): Pakistan Education Statistics 2004-05, *Ministry of Education Islamabad, Pakistan*

Government of Pakistan (2006): Demand for Grants and Appropriations 2006-07, *Government of Pakistan, Finance Division Islamabad*

Government of Pakistan (2005): PR SP, Annual progress Report FY 2004-06, *PRSP Secretariat, Finance Division, Government of Pakistan September.*

Government of Pakistan (2006): Economic Survey of Pakistan 2005-06, *Ministry of Finance, Islamabad.*

Government of Sindh (2006): Budget 2006-07, Vol. I II, Current Expenditure on Education & Health, *Finance Department, Government of Sindh, Karachi.*

Government of NWFP (2006): Demand for Grants Current Expenditure for 2006-07, Vol. III, (PART-A) *Government of NWFP, Peshawar.*

Government of NWFP (2006): Demand for Grants Current Expenditure for 2006-07, Education, Vol. III, (PART-A) *Provincial Government of NWFP, Finance Department*

Government of Punjab (2006): Estimate of Charged Expenditure and Demand for Grants (Current Expenditure), *Vol. I (Fund No. PC 21016-PC 21016) 2006-07*

Government of Balochistan (2006): Demand For Grants and Current Expenditure (New Accounting) for the Year 2006-07, Education Vo l. III-A), *Provincial Government of Balochistan, Finance Department.*

Gupta, S., Marijn,V., Erwin,R.T. (2002): "The effectiveness of g overnment spending on education and health care in developing and transition economies" *European Journal of Political Economy Vol. 18 (2002)*

Hamid, R. Davoodi, Erwin R. Tiongson, and Sawitree S. Asawanuchit (2003): "How Useful Are Benefit Incidence Analyses of Public Education and Health Spending?" *IMF Working Paper 227, WP/03/227*

Husain F., M.A. Qasim and K.H.Sheikh (2003): "Analysis of Public Expenditure on Education in Pakistan", *The Pakistan Development Review, Vol 42, No 4, winter 2003.*

Jorge Martinez-Vazquez (2001): "The Impact of B udgets on the Poor: Tax and Benefit Incidence", *Andrew young School of Policy Studies Georgia State University, International Studies Program, Working Paper 01-10, 2001,*

Lanjouw, Peter and Martin Ravallion (1999): "Benefit Incidence, Public Spending, Reforms, and the Timing of Program Capture", *The World Bank Economic Review, vol. 13(2): 257-73.*

Meerman, J. (1979): "Public Expenditure in Malaysia: Who Benefits and Why?" *New York, Oxford University Press.*

Norman Gemmell (1985): "The incidence of Government Expenditure and Redistribution in the United Kingdom" *Economica, New Series, Vol 52, No. 207 (Aug., 1985), pp. 336-344*

Pascharropolous, G. (1994): "Returns to investment in education: a global update", *World Development 22, pp 1325 -1343*

Rasmus, H., Kenneth S. and Finn T(2001): "Public Spending and Poverty in Mozambique", UNU/WIDER project on New Fiscal Policies for Growth and Poverty Reduction 14 June 2001

Roberts, John (2003): "Poverty Reduction Outcomes in Education and health: Public Expenditure and Aid". Working paper No.210, Center for Aid and Public expenditure, overseas Development Institute 111 Westminster Bridge Road LondonSE1 7JD UK.

Sabir, Muhammad (2003): "Gender and Public Spending on Education in Pakistan: A Case Study of Disaggregated Benefit Incidence", Paper No.48 presented at conference of Social Policy Development Centre (SPDC)

Sahn, D. and Bernier, J. (1993): "Evidence from Africa on the intra-sectoral allocation of the social sector expenditure". Cornell food and Nutrition Policy program paper No .45, Cornell University, Ithaca

Sahn, D. and Younger, S. (2000): "Expenditure incidence in Africa: microeconomic evidence", Fiscal Studies, vol. 21, pp. 329–47.

Sakellariou Chris and H.A Patrinos (2004): "Incidence Analysis of Public Support to the Private Education Sector in Cote d Ivoire" World Bank Policy Research Working Paper 3231, March 2004

Samer, Al-Samarri and Hassan Zaman (2002): "The changing distribution of public education expenditure in Malawi", Institute of Development studies, University of Sussex and the World Bank January 2002.

Selden, Thomas M and Michael Wasylenko (1992): "Benefit Incidence Analysis in Developing countries" World bank Policy Research Working Paper No 1015, Washington D.C. (November)

Selowsky (1979): "Who benefits from government expenditure? A case study of Columbia", Oxford University press

Shahin, Yaqub, (2001): "How Equitable Is Public Spending on Health and Education?" Background Paper to WDR 2000

SPDC, (2004): "Social Development in Pakistan 2004: Combating Poverty: Is Growth Sufficient?" Annual report 2004, Karachi

World Bank (1995): "Priorities and Strategies for Education" A World Bank Review. World Bank, Washington, DC

Younger, Stephen D. (1999): "The Relative Progressively of Social Services in Ecuador". Public Finance Review Vol 13, No 2

Appendix 1

Consider the benefit of the public spending on education. This is given by

DEFINITION OF PUBLIC SUBSIDY

The service-specific public subsidy received by an individual is,

$$S_k = q_k c_k - f_k \quad \text{_____ 1}$$

Where S_k represents subsidy received by the individual on service k, q_k indicates the quantity of service k utilized by individual c_k represents the unit cost of providing k in the region where individual resides and f_k represents the amount paid for k by individual.

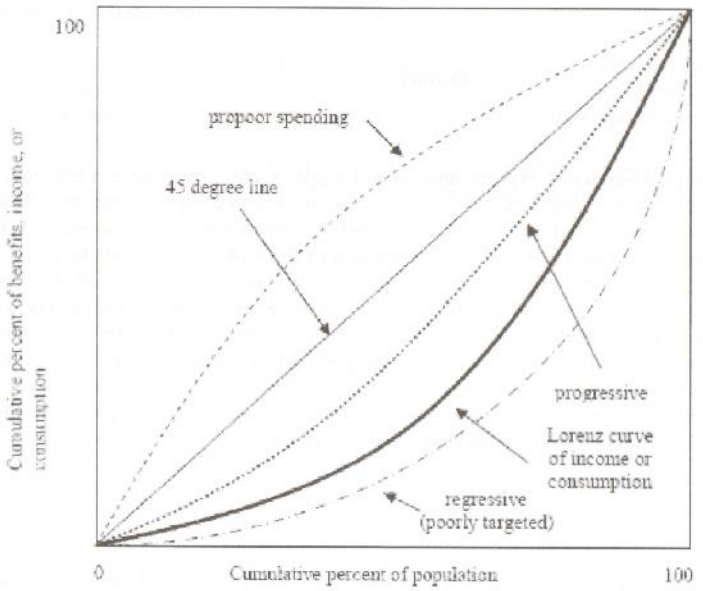
$$S_j = \sum_{i=1}^{4} H_{ij} \frac{E_i}{H_i} = \sum_{i=1}^{4} \frac{H_{ij}}{H_i} E_i \quad \text{_____ 2}$$

Where S_j is the value of the total education subsidy imputed to group j, H_{ij} represents the number of enrolments in group j to the education facilities at the level i (i representing primary, secondary, higher or Professional education in education), H_i is the total no of such visits (across all groups) and E_i is the government spending on education at level i (with fees and other cost recovery netted out). Note that E_i/H_i is the unit subsidy of attending a school at level i the share of the total education subsidy E_i accruing to the group is given by

$$S_j = \sum_{i=1}^{4} \frac{H_{ij}}{H_i} \left(\frac{E_i}{E}\right) = \sum_{i=1}^{4} b_{ij} . e_i \quad \text{_____ 3}$$

Clearly, this share (and indeed overall inequality in the benefit incidence) is determining two proximate factors: The share of the group in total attending a school at each level of the facility b_{ij} and the share of the each level of education total education spending e_i. The value b_{ij} reflect household decision to attend a school, where as the value e_i reflects government spending allocation.

There are two useful methods for analyzing expenditure incidence results by income group one is concentration curves and the other is concentration index. To draw a concentration curve, the population is usually arranged from poorest to richest. As our purpose here is to determine the effect of government expenditures, the population is arranged in ascending order of income i.e., from poorest to richest. The population is grouped in income deciles in which are not equal in size in terms of household. A concentration curve shows the cumulative proportion of expenditures going to cumulative proportions of the population. So it is similar to a Lorenz curve



However, unlike the Lorenz curve, which shows the cumulative proportion of income earned by the cumulative population, a concentration curve can lie above the diagonal: The poorest 40% of the population cannot earn more than 40% of income, but they can get more than 40% of spending on social grants.

The concentration curve that lies above the Lorenz curve are least progressive or weakly equity enhancing i.e., it would redistribute the resources even if funded by proportional taxes, and the poorer are comparatively better off when considering both their income and public spending, compared to considering only their income. The concentration curve which lies above the diagonal shows that spending is targeted at the poor, i.e. it is strongly equity-enhancing or per capita progressive or pro-poor i.e., the poor benefit more than proportionately to their numbers. If a concentration curve lies everywhere above the 45-degree line, the benefit is per capita progressive, indicating that poorer households receive disproportionately large shares of the benefit. Concentration curves that lie below the Lorenz curve are classified as regressive. This concept has been taken from Sahn and Younger (2000) who ha ve examined the progressively of social sector expenditures in eight Sub-Saharan African countries. By employing dominance tests, complemented by extended GINI/concentration coefficients, to determine whether health and education expenditures redistribute resources to the poor. According to them concentrati on curves are a useful way to summarize information on the distributional benefits of government expenditures, statistical testing of differences in curves is important.