



Efficiency and Fairness in Government Expenditure : A Case Study of Education Expenditure in Papua New Guinea

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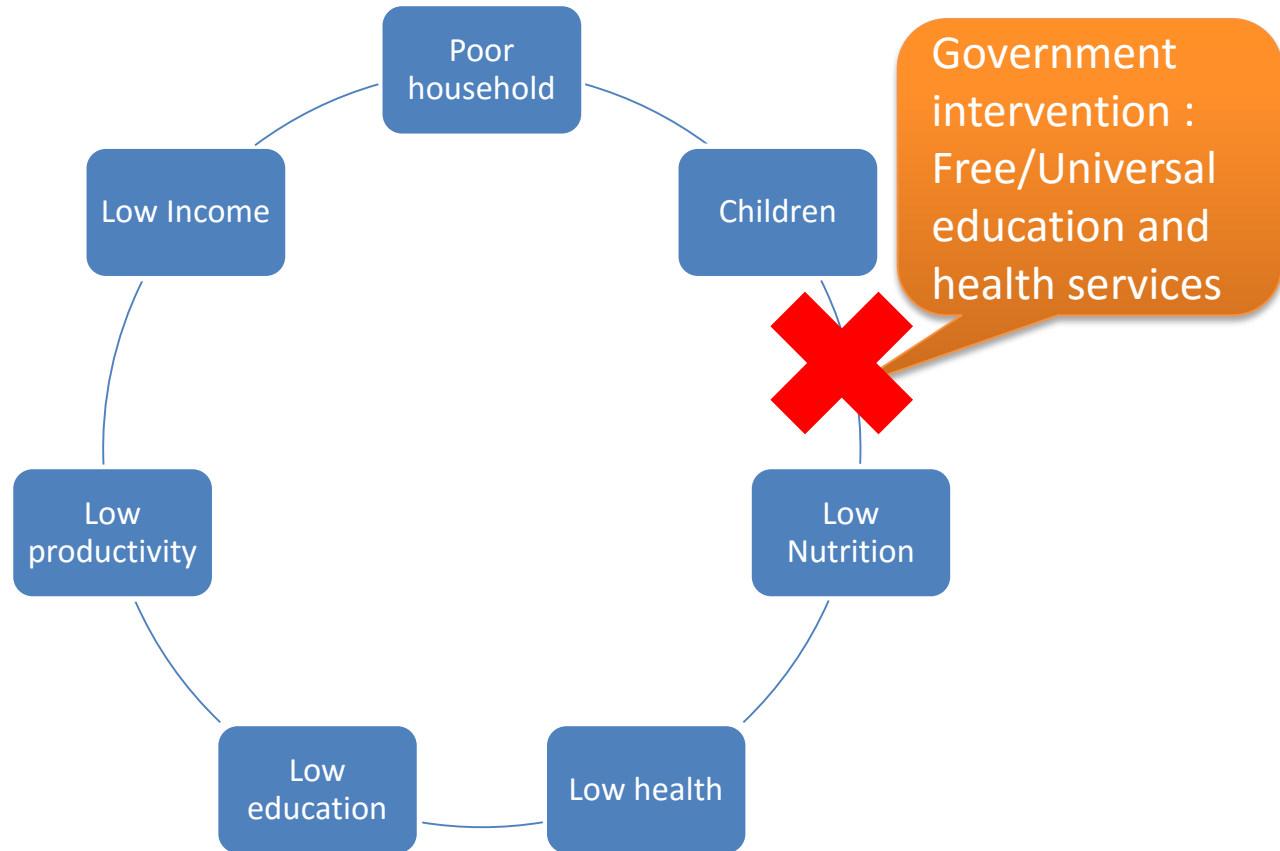
Wawan Juswanto

Senior Economist/Special Adviser to Dean
Capacity Building and Training Department
Asian Development Bank Institute

Outline

- Government Expenditure and Long-term Poverty Reduction Strategies
- Problem and Solution
- Explanation of BIA Approach
- Education Sector in Papua New Guinea
- Conclusion

Government Expenditure and Long-term Poverty Reduction Strategies



Government Expenditure, Poverty and Equality

- Initial investment in health and education will generate higher future income. (Todaro and Smith , 2006)
- There is a strong positive relationship between the wages and salaries that people receive at work and their level of education. Those with higher level of education seem to have, on average, a higher level of productivity. The earning by age of the more educated not only starts at a higher level but increases more rapidly to a peak than is the case with the earning profiles of the less educated. Those without education tend to have a rather flat earning throughout their life. These patterns indicate that education does not just make people more productive, but it also enhances the ability to learn by doing, causing productivity and earning to increase at a faster rate. (Zoe, 1997)
- Education , especially basic (primary and lower-secondary) education, helps reduce poverty by increasing the productivity of the poor, by reducing fertility and improving health and by equipping people with the skills they need to participate fully in economy and society (World Bank, 1995)

- Development, education and health expenditure help to reduce poverty in India while per capita income is not significant in explaining poverty (Raghbendra 2001)
- Landholdings and irrigation of the original household are critical factors underlying the income growth of parents, which leads to an improvement in the human capital of children through schooling investment in rural Philippine. The improved human capital of children, in turn, increases the probability of obtaining lucrative non-farm jobs especially in cities and abroad. the increased income of parents contributes to poverty alleviation for the children in the long run through its effect on improvements in the human capital of children (Takahashi and Otsuka, 2007)
- Government expenditure on human capital and better infrastructure availability have a positive impact on poverty reduction in Indonesia. Moreover, higher unemployment rate will increase the number of people living below the poverty line. Increase the share of wage earner will decrease the percentage of people below the poverty, Finally, provinces with a more unequal income distribution tend to have higher percentage of people living below poverty line (Wawan Juswanto 2010)

Problem and Solution

- What should government do for targeted spending? *Identify who receive benefit from the spending*
- What is the main Challenge? *Data availability*
- What is the solution? *One of the alternative solutions is Benefit Incidence Analysis. BIA is an easy-to-use tool for ex ante design as well as ex post monitoring and for evaluating the effectiveness of spending program*

Explanation of BIA Approach : Education spending

The benefit from government expenditure on education level i (primary, secondary, and tertiary) accrued to group j (X_{ij}) is estimated as

$$X_{ij} = \frac{E_{ij}}{E_i} S_i = \frac{S_i}{E_i} E_{ij} \quad (1)$$

Where

E_{ij} : the number of students enrolled in level i from group j

S_i : amount of government expenditure on education in level i

S_i/E_i : the average cost of providing education in level i

Therefore, the total benefit from government expenditure on all education or all health services accrued to group j is

$$X_j = \sum_{i=1}^n X_{ij} \quad (2)$$

by substituting equation 1 into equation 1, it can be arranged as

$$X_j = \sum_{i=1}^n E_{ij} \frac{S_i}{E_i} = \sum_{i=1}^n \frac{E_{ij}}{E_i} S_i \quad (3)$$

The method involves, at least, a four-step process that can be easily implemented using popular spreadsheet programs (Education spending) :

1. Obtain the average unit cost of providing education service by dividing government spending on education sector with the total number of student: S_i/E_i .
2. Rank the population of users from poorest to richest using welfare measures and aggregate them into groups with equal numbers of users. We may use total monthly expenditure of households as a proxy for welfare measure
3. Obtain the number of enrolled students in each level of education from each group; and
4. Derive the distribution of benefits by multiplying the average benefit with the number of student in each group.

Education Sector in Papua New Guinea

Table 1 Number of People Below Poverty Line, Pacific Region, 2014

Country	Population (1000)	Proportion of Population Below the Poverty Line* (%)	Number of People Below the Poverty Line (1000)
Cook Islands	18.60	28.4	5.28
Fiji	866.51	31	268.62
Kiribati	112.33	21.8	24.49
Marshall Islands	53.75	52.7	28.33
Micronesia, Federated States of	104.12	31.4	32.69
Nauru	10.63	25.1	2.67
Palau	17.27	24.9	4.30
Papua New Guinea	7,611.88	28	2,131.33
Samoa	192.07	26.9	51.67
Solomon Islands	577.99	22.7	131.20
Timor-Leste	1,212.11	49.9	604.84
Tonga	104.02	22.5	23.40
Tuvalu	11.10	26.3	2.92
Vanuatu	271.57	12.7	34.49

Source : Basic statistic ADB, various years, author calculation

* Using national poverty line of respective country

Table 2. Education System in Papua New Guinea

Education	School/Level	Grade From	Grade To	Age From	Age To	Years
Primary	Elementary Education	1	6	7	12	6
Middle	Four-year provincial high schools	7	10	13	17	4
Secondary	Two-year national high schools	11	12	18	19	2
Tertiary						

Primary Education

Education in Papua New Guinea is still not compulsory. Elementary schooling takes 2 years at a local community school where the medium of education is the local language. Following this introductory period, children aged 9 to 14 remain on at the same community schools to complete their grades 3 to 8.

Middle Education

If their academic record at primary school is assessed as being suitable, then children may go on to a provincial high school for a period of 2 years. There the medium of education is English.

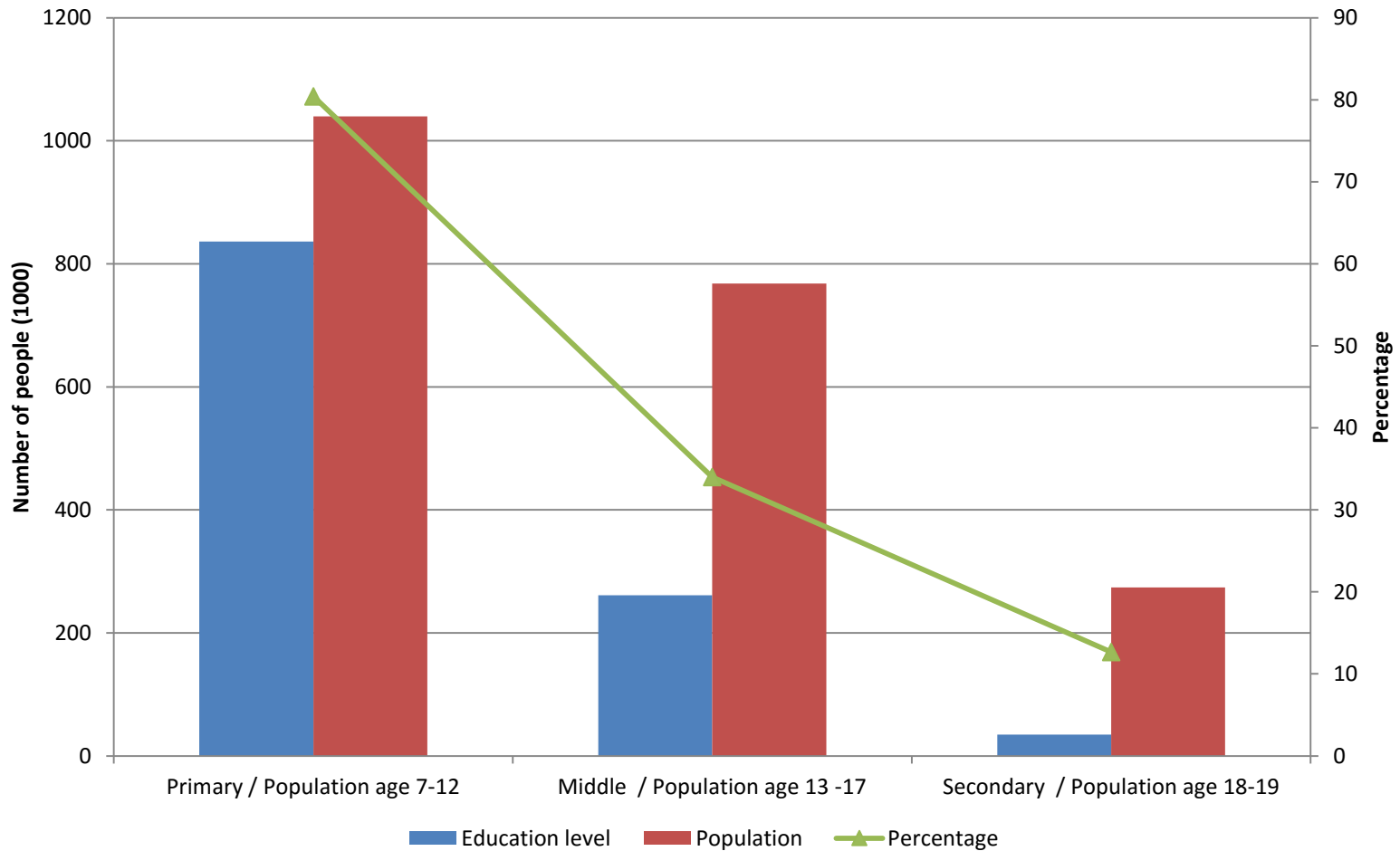
Secondary Education

Students with academic ambition may apply to attend a national senior high school for a final period of 2 years.

Tertiary Education

There are seven universities in Papua New Guinea, some of which are state funded while others are private or have religious affiliations. The Pacific Adventist College offers programs in accounting, business, education, secretarial skills and theology, and the University of Technology provides degrees in architecture, business, engineering and forestry.

Graph 1. Estimated number of population by age group and student by level of education, PNG, 2010



Source : PNG Household Income and Expenditure Survey 2009-2010, WB database, Author calculation

Table 3 : Estimation of number of Student by Income Group and Level of Education, PNG 2010

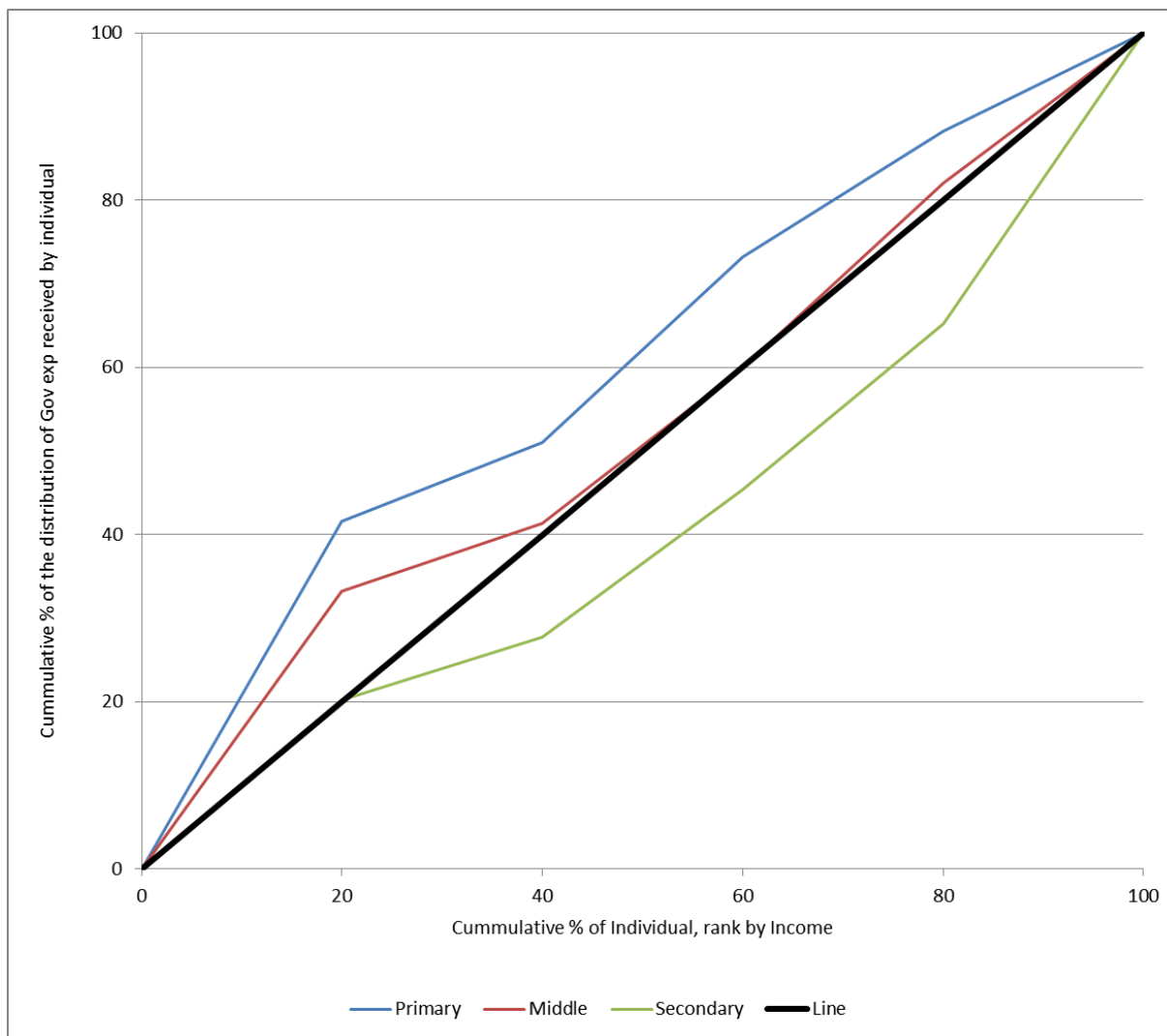
Income Group	Primary	Middle	Secondary
1	347,966	86,841	6,996
2	78,714	21,213	2,610
3	185,685	48,449	6,134
4	125,524	57,726	6,896
5	98,117	46,814	12,051
	836,006	261,043	34,687

Table 4 : Estimation of Share of Student by Income Group and Level of Education, PNG 2010, %

Income Group	Primary	Middle	Secondary
1	41.6	33.3	20.2
2	9.4	8.1	7.5
3	22.2	18.6	17.7
4	15.0	22.1	19.9
5	11.7	17.9	34.7
	100.0	100.0	100.0

Source : PNG Household Income and Expenditure Survey 2009-2010, Author calculation

Concentration Curve : The Distribution of Student On Different level of Education



Source : PNG Household Income and Expenditure Survey 2009-2010, Author calculation

Preliminary Conclusion

- The distribution of education expenditure on Primary and Middle Education will be relatively in favor of lower-income population.
- The distribution of education expenditure on Secondary education will be relatively in favor of higher-income population

What policy recommendation may be proposed :

For long to medium term poverty reduction goals, given the size of educational spending in the budget, government of PNG should place priority on Primary and Middle education. Both level are relatively in favor of lower-income population.

Thank you