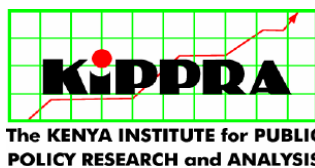


Free Secondary Education in Kenya: Costs, Financing Sources and Implications

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Abstract

The study analyses the feasibility of Free Secondary Education (FSE) in Kenya. Its purpose is to present an analysis on whether Kenya can afford FSE and how such a programme can be financed without compromising the gains being experienced in other sectors of the economy. The study used both qualitative and quantitative analytical techniques to analyse secondary data mainly from government sources. An Education Simulation Model (EdSim) was used to arrive at educational outputs and costs of different scenarios of FSE. The outputs from EdSim provided inputs for the KIPPRA Treasury Macro Model (KTMM) in order to evaluate the macroeconomic implication of financing FSE under different scenarios. Descriptive analysis is used to complement the results from the two models. The study shows that in the short run, financing full FSE could have inflationary implications. In addition, it would cause a financial squeeze of resources from other equally deserving sub-sectors. The implications vary by the approach used—that is, either a full FSE or a gradual implementation of FSE. However, as the economy continues to experience good performance, it is possible to introduce targeted subsidies in secondary education, starting with teaching and learning materials and computers (and related accessories). The study was not able to quantify the effects of FSE on other competing sub-sectors such as health and social protection due to analytical limitations. The study concludes that FSE is publicly affordable but at a moderate to high cost. Introduction of FSE would trigger a series of more education reforms, including changing the role of pre-secondary national examinations from that of a selection tool to an instrument for measuring pupils' competencies. The study recommends provision of free teaching and learning materials and computers in the short run, with CDF supporting educational infrastructure development. More subsidies should be considered in the future. Moreover, as an affirmative action to raise real transition to secondary, a transition programme is necessary and should include targeting a proportion of an enhanced secondary bursary fund to needy Form 1 students who should be identified while in Standard 8. Finally, it is important for the Ministry of Education to establish the real unit cost of secondary education inputs to appropriately inform sustainable financing of envisaged secondary education expansion.

List of Abbreviations

ASALs	Arid and Semi-Arid Lands
ATL	Average Teaching Load
BOPA	Budget Outlook Paper
BSP	Budget Strategy Paper
CBC	Constituency Bursary Committee
CBS	Central Bureau of Statistics
CDF	Constituency Development Fund
CPP	Core Poverty Programme
EdSim	Education Simulation Model
F1	Form 1
FPE	Free Primary Education
FSE	Free Secondary Education
FTE	Full Time Equivalent
FTEP	Full Time Equivalent Provision
FY	Financial Year
GDP	Gross Domestic Product
GER	Gross Enrolment Rate
GNI	Gross National Income
GNP	Gross National Product
GoK	Government of Kenya
HIV/AIDS	Human Immunodeficiency Virus / Acquired Immune Deficiency Syndrome
IFAD	International Fund for Agricultural Development
KCPE	Kenya Certificate of Primary Education
KEPSA	Kenya Private Sector Alliance
KESSP	Kenya Education Sector Support Programme
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KNUT	Kenya National Union of Teachers
KTMM	KIPPRA-Treasury Macro Model
M&E	Monitoring and Evaluation
MoE	Ministry of Education
MPER	Ministerial Public Expenditure Review
NER	Net Enrolment Rate
OVC	Orphans and Vulnerable Children
PCR	Pupil Class ratio
PERT	Project Evaluation and Review Technique
PTR	Pupil Teacher Ratio
SSA	Sub-Saharan Africa
TIVET	Technical, Industrial, Vocational, Entrepreneurship and Training
TLM	Teaching and Learning Materials
YP	Youth Polytechnic

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1. Introduction

1.1 Background

The importance of secondary education to a country like Kenya cannot be overemphasized. The need for a workforce that can adapt to the fast changing global dynamics is critical for sustainable growth and development. Secondary education links primary schooling to further training in tertiary institutions and forms a human capital base that is the cornerstone of firm productivity (Lall, 2000). This level of education has both private and social returns, not to mention the spillover effects, which make it a concern of both individuals and the society. Lack of adequate secondary education capacity is hence likely to undermine the gains already made towards achieving universal primary education. Given the importance of secondary education to firm productivity, any country ignoring the expansion of this level of education will only do so at its own peril. It is no wonder, therefore, that in the past one year there has been a debate within and outside the government on whether secondary education should be part and parcel of basic and compulsory education in Kenya. In recent times, the issue of *who should pay* for secondary education has gained momentum with the debate entering the public policy agenda. This study is an attempt to contribute to that debate.

This paper focuses on the cost of a subsidized secondary education, financing sources and the implications of such financing. It would be interesting to establish whether subsidized secondary education can be achieved without compromising the quality of education and other investment choices such as Free Primary Education (FPE), internal security, youth employment creation and social protection. While this question may attract a yes/no response, we chose to be analytical and provide some informed discussions on how such a policy shift could be implemented and thereafter enumerate some possible social and economic implications of such a move. To be able to present our analysis, it is necessary to make some sound assumptions and simulate the secondary education financing situation in the coming years given the policy shift. Thereafter, we estimate the resource requirements to meet the induced demand for secondary education. In this study, FSE refers to non-payment of school fees by parents. It entails heavy public subsidy to secondary education provided in public schools.

Is public subsidy to secondary education justifiable? Providing secondary education can be an expensive affair given the relatively high cost of secondary school inputs and the high secondary teacher unit costs. The need for public support to finance secondary education non-salary inputs can be justified by four interrelated considerations: *First*, is equity consideration. Public intervention is necessary to safeguard against inequalities in access

to this public good, given the relatively high household poverty incidences, estimated at 46 per cent (Kenya National Bureau of Statistics, 2007). Left to the market, social selectivity will set in to favour privileged households. *Second*, is the value of secondary education. Educating children up to this level has private benefits that accrue to the individuals and households, and most of which cannot even be quantified (Manda, Mwabu & Kimenyi, 2002). *Third*, closely related to the previous justification is the issue of societal benefits and spill-over effects (externalities) associated with secondary education. The society benefits through increased productivity of well educated labour force (Sianesi, 2003; Blundell, Dearden & Sianesi, 2001). In addition, spillover effects have been shown to exist in the society due to provision of secondary education (Giovagnoli, Fiszbein & Patrinos, 2005). Such spillover effects include the positive effects of secondary education on mortality, health, nutrition, internal security, and demographic dynamics, among others. *Finally*, is market failure. In this case, private markets, if left alone, may not satisfy private and social demand for secondary education largely due to information asymmetry and their capitalistic behaviour.

1.2 Motivation of the Study

In the recent past, there has been public concern on the relatively high cost of secondary education, inadequate school places in certain localities/regions and generally low enrolments. The Sessional Paper No. 1 of 2005 clearly spells out the government's commitment to continue providing free and compulsory primary education for all children (Government of Kenya, 2005a). This is in line with the Children Act 2001 that called for the provision of free and compulsory *basic* education (Government of Kenya, 2001). In this regard primary education is viewed as the basic education. However, Sessional Paper No.1 of 2005, while elaborating on the government policy on secondary education, states that "... the government will implement the following policies: In the long term, work towards integrating secondary education as part of basic education" (Government of Kenya, 2005a: 45). In essence, therefore, the government foresaw the need to provide FSE. In 2006, a taskforce on *The Review and Harmonization of the Legal Framework Governing Education, Training and Research* reiterated the need to provide free and compulsory basic education for every Kenyan child, with secondary education being part of this basic education (Kamunge, 2006). More recently, the general public and leaders within and outside the government have joined the public debate on FSE. This paper was motivated by these events and hopes to objectively inform this debate and any future work on FSE.

1.3 Purpose of the Study

The purpose of this study is to analyse the cost and financing sources of FSE and highlight the policy implications of such a move. Specifically, the study attempts to answer the following questions: (i) What is the cost of implementing a subsidized secondary education; (ii) What are the possible scenarios of subsidizing the cost of secondary education; (iii) What are the various financing sources in the event of introducing a FSE policy; (iv) What targeting approaches can inform the bursary scheme in Kenya; (v) What are the implications of FSE; and (vi) What is the way forward for Kenya as far as FSE is concerned.

1.4 Methodology

This paper is informed by both qualitative and quantitative analysis of secondary data. To establish resource needs and costs of FSE, secondary data were collected from Ministry of Education sources and Budget Strategy Paper (BSP) 2006, among others. An Education Simulation Model (EdSim) was used to simulate student flows and their respective resource requirements in nominal terms from year 2008 to 2011. EdSim is a resources requirement model that uses predetermined policy parameters and baseline inputs to project education outputs and resource needs. Its strengths lie in the ability to relate inputs, outputs and costs over time. However, like any other projection model, it cannot be perfect and the outputs, including the projected costs, should always be treated as estimates. Revised estimates should be generated wherever new data for the baseline is available and/or policy parameters are changed. A four year period was used to cover a full cycle of secondary education.

The KIPPRA-Treasury Macro Model (KTMM) was used to evaluate the macroeconomic implications of the required extra cost of financing secondary education if FSE or any other heavy public subsidy were to be implemented. KTMM is a simultaneous aggregate demand type macro model of a market economy (Were, 2006). The model is used in analysing the effects of economic developments on the budget framework, evaluating policies and building different scenarios based on different assumptions and unforeseen events (Were, 2006). The extra cost was disaggregated into recurrent and development, which was translated into extra consumption and investment respectively, holding other things constant.

This paper uses available information to provide a descriptive analysis of the various scenario costs of implementing Free Secondary Education. However, our argument is that other sectors will also be receiving their

budget shares and even investment in education will positively enhance productivity in these sectors.

To arrive at input costs, various policy parameters used by the Ministry of Education and those recommended by previous KIPPRA studies were adopted (for a detailed analysis of secondary education policy parameters see Onsomu, *et al.*, 2006a; and Ngware, *et al.*, 2006). In addition, the average market prices of teaching and learning materials were used as recommended in the Ministry of Education 'Orange Book' (Government of Kenya, 2006a). It is important to note that such prices are subject to revision from time to time by the stakeholders in order to reflect the reality. If such changes in input prices occur, the aggregate input costs will be expected to change accordingly.

2. An Overview of Secondary Education

2.1 Conceptual Framework

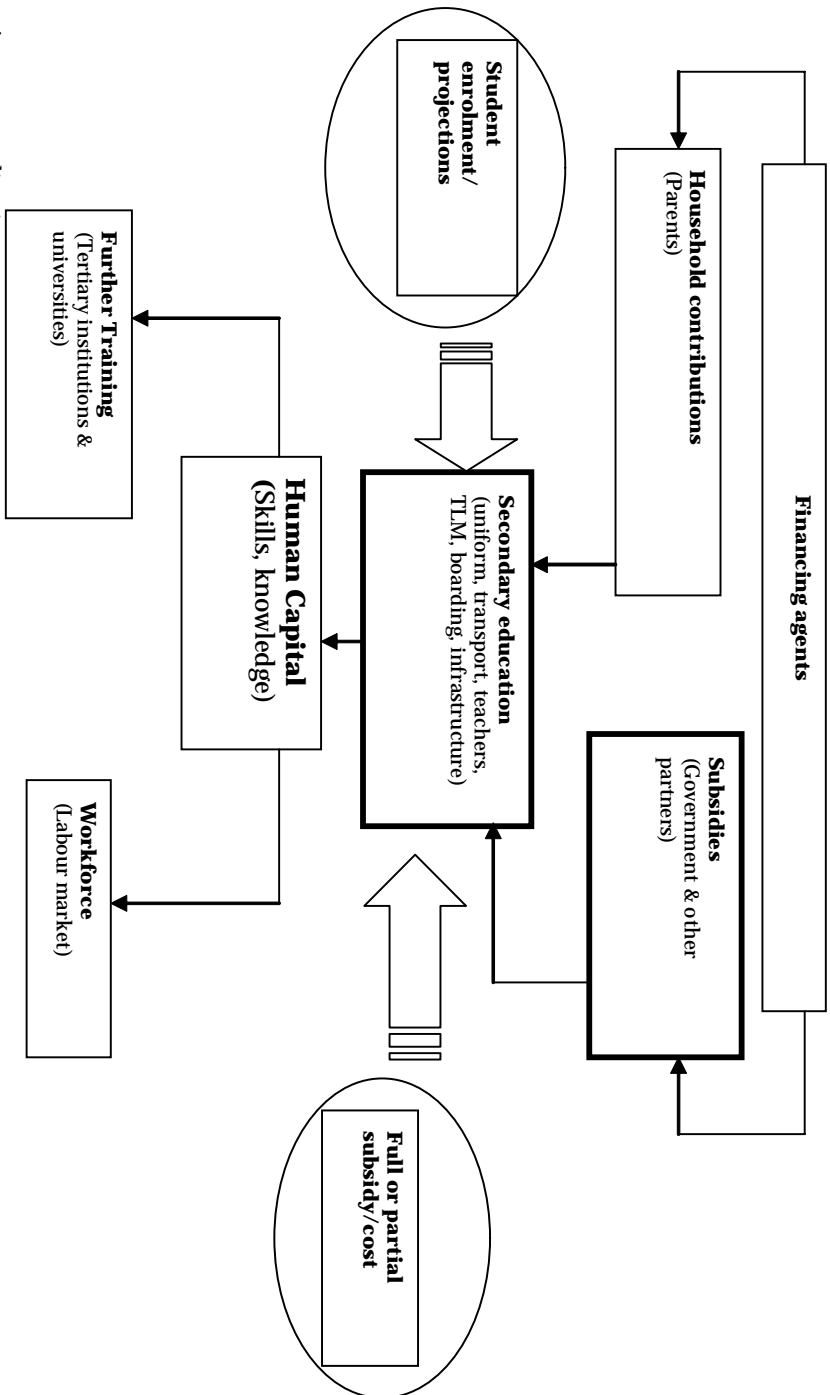
Figure 1 shows a conceptual framework with public subsidies coming from the government and other partners to finance secondary education. Despite the subsidies, parents and communities still have a role to play in meeting the cost of secondary education. In Kenya, while the government meets the cost for teachers, parents pay for all other non-teaching expenses of secondary education. Increasing public expenditure on secondary education would imply more subsidies to secondary education, which in essence means shifting some or all the cost burden of secondary education from the parents to the government and its partners. The public has options, including implementing either a full subsidy or partial subsidy, which would lead to variation in student enrolments as a measure of policy output. Such enrolment can easily be projected in order to arrive at the resource needs in terms of human, physical and financial resources. A policy shift in favour of subsidies would see more students from disadvantaged backgrounds access secondary education, leading to more human capital and further education and training.

2.2 Secondary Education in Kenya

A quick look at some demographic statistics and financing figures (Tables 1 and 2) on secondary education helps us to rest this issue in the context. Secondary education sub-sector in Kenya has been an issue of concern as noted earlier. Access is still limited as the real transition rate is below 40 per cent (Table 1) with net enrolment rate being as low as 20 per cent. Besides, budgetary allocation to this sub-sector is about 1 per cent of GDP, of which 95 per cent goes to recurrent expenditure.

From Tables 1 and 2, five observations that are relevant to the debate on FSE stand out clearly. *One*, that the annual unit expenditure Ksh 49,470 (55 per cent public household expenditure) of secondary education is far above the per capita income in Kenya of about Ksh 45,447. This unit cost is supply driven and may not necessarily reflect market prices of non-teacher school inputs. *Two*, households contribute about 55 per cent of the direct cost of secondary education (for details of costs see Onsomu *et al.*, 2006a). *Three*, the 2006 real transition rate (based on enrolment rather than F1 selection) from Std 8 to F1 shows that about 68 per cent of those who completed Std 8 did not enrol in F1 in the following year for various reasons. *Four*, in 2005 and 2006, real transition rate was low, 33 per cent and 32 per cent respectively; and lastly, GER and NER are quite low (30% and 20%, respectively). The existence of cohort wastage has been shown to be relatively

Figure 1: A conceptual framework for secondary education subsidies



Source: Author's conceptualisation

Table 1: Selected secondary education indicators (2004- 2006)

Indicator	2004	2005	2006
Secondary school age population (14-17 years) (million)	3.14	3.19	3.26
Secondary school gross (public) enrolment (million)	0.841	0.853	0.897
Secondary school gross (public and Private)enrolment (million)	0.923	0.928	0.955
Secondary GER (%)	29.8	30.2	30.0
Secondary NER (%)	19.4	19.8	20.0
Standard 8 enrolment (million)	0.637	0.675	0.665
Form 1 enrolment (public and private)	0.268	0.234	0.241
Transition (nominal) rate to F1 (%)	50.6	52.1	57.0
F1 as a % of Std 8 – real transition - (the group from which they came from)	44.38	33.09	31.89
Number of schools: Private secondary schools	490	573	569
Number of schools: Public secondary schools	3,621	4,194	4,215
Total number of secondary schools	4,111	4,194	4,215
Number of classrooms	22,914	22,914	23,620
Pupil class ratio	36.70	37.23	37.98
Number of teachers	47,235	47,514	48,893
Pupil teacher ratio	18	18	18
Secondary completion rate (%)	89.6	89.8	89.6
Total public secondary budget as % of education budget	21.5	21.0	23.0
Secondary recurrent expenditure as % of secondary budget	96.8	94.3	92.0
GDP per capita income (Ksh)	39,060	42,280	45,447
Estimated annual public unit expenditure on secondary education (2006/07) (Ksh)	20,090	20,020	20,625

Sources: Ministry of Education (2007a); Government of Kenya (2005b, 2006b); Authors Computations. ** n.a. Data was not available by the time of writing this paper.

Table 2: Ministry of Education secondary education allocations, 2005/06 - 2006/07

Category/economic classification	2006/07*	2005/06
Ministry Recurrent (Ksh millions)	86,276.1	93,750.52
Ministry Development (Ksh millions)	6,449.1	6,036.95
Total Ministry (Ksh millions)	92,725.2	99,787.47
Total Ministry as % of GDP	6.6	6.4
Total Ministry as % of government total expenditure	25.8	23.7
Total Ministry recurrent as % of government total recurrent	32.2	33.1
Ministry recurrent as % of Ministry expenditure	93.0	94.0
Secondary teachers salary (Ksh millions)	18,364.95	22,676.16
Total Ministry salaries (Ksh millions)	74,014.9	79,472.3
Secondary teachers salaries as % of salaries	24.8	28.5
Secondary teachers salaries as % of total Ministry recurrent	21.3	24.2
Total salaries as % of total Ministry recurrent	85.8	84.8
Bursary expenditure (Ksh millions)	800	800
Other GoK expenditures to secondary school - Grants to ASALs, Pockets of Poverty, Classrooms - ASALs and slums, science equip to targeted schools (Ksh millions)	1520.6	865.6
Total estimated household contributions in form of fees (Ksh millions)	27,195.7	29,338.7
Household contributions in form of fees as % of combined GoK and households	53.0	54.7
Combined government and household contribution in form of fees (Ksh millions)	51,227,798	52,814.86
Estimated annual unit expenditure of secondary education in public secondary schools (households contribution to fees and GoK) [Ksh]	50,738	49,470

Sources: Ministry of Education (2007a); Government of Kenya (2006b); Authors Computations. **n.a data not available; *provisional

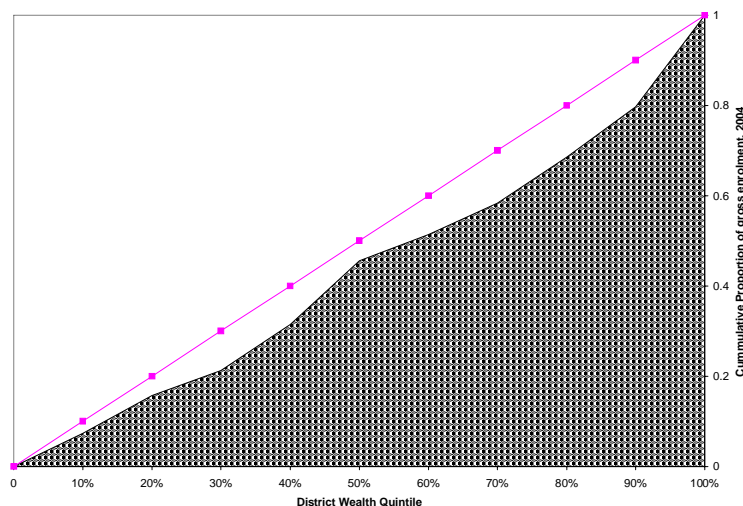
low, sometimes below 10 per cent leading to high completion rate of about 90 per cent.

From such a background we conceptualize the problem the policy maker has to gamble with as that of shifting part or all the direct cost burden (about 53%) of secondary education from households to the government. Such a move is very justified largely due to the socio-economic benefits that accrue to the public from investment in secondary education and for equity considerations. However, this is not to say that such a policy shift would be smooth. There should be considerations as to whether such a move would promote equity given the current enrolment patterns and the role of bursaries and households in a FSE situation.

Equity of access to secondary education and bursary distribution

Inequity in access to secondary education is well understood when the regional picture is brought to the fore. Using the constituency poverty incidence data, it is possible to compute indicative figures for districts and then divide this into district wealth quintiles (for constituency poverty incidence see Central Bureau of Statistics, 2005). The Lorenz curve shown in Figure 2 compares the districts wealth quintiles and the cumulative

Figure 2: Equity of access to secondary education by district wealth quintiles

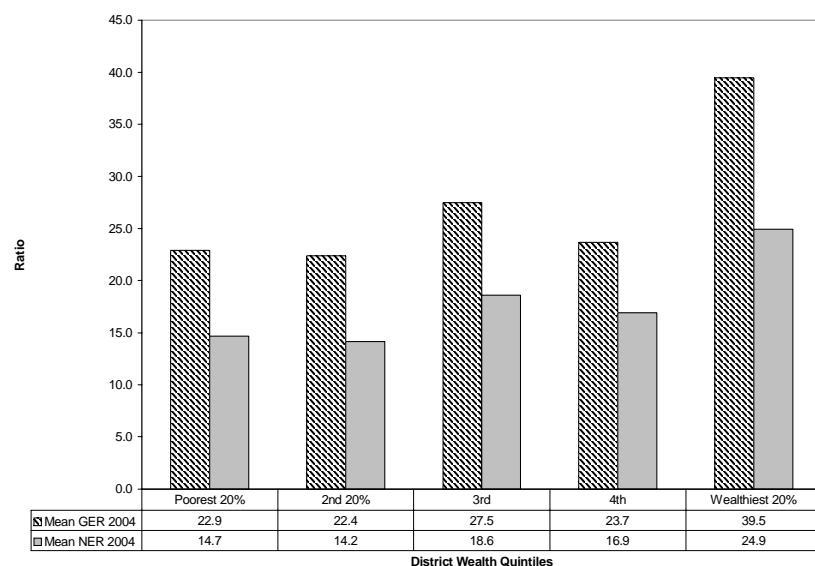


proportion of enrolment yields. In Figure 2, the gini-coefficient is relatively high (0.14). The poorest 10 per cent of the districts had access to 7.4 per cent of secondary school places compared to 20.3 per cent occupied by the wealthiest 10 per cent of the districts. However, it is notable that such a disparity, although of major concern, does not look alarming. By implication, given this enrolment pattern, it would mean that any introduction of FSE would benefit wealthier districts relatively more than poorer districts as they have a relatively higher capacity to enrol students.

Figure 3 presents the 2004 mean Gross Enrolment Ratio (GER) and Net Enrolment Ratio (NER) by district wealth quintile. The figure confirms that access to secondary education is skewed with a few wealthier districts having higher ratios (Onsomu *et al.*, 2006b; and World Bank, 2007). Emerging issues here include the low enrolment rates, which are worsened by the inequitable access to secondary education. However, it should be noted that the 1st, 2nd and 4th quintiles have almost similar and low enrolment levels. This, to an extent, implies that majority of the districts have low enrolment rates besides the wealth distribution situation.

The secondary education bursary scheme was introduced in the 1990s to assist students from poor households to access secondary education. Bursary allocations may also give an overall picture of how access to secondary education is promoted across regions. Figure 4 shows the proportion of secondary school bursary going to various district wealth quintiles. From the figure, the poorer districts are receiving relatively higher proportions of

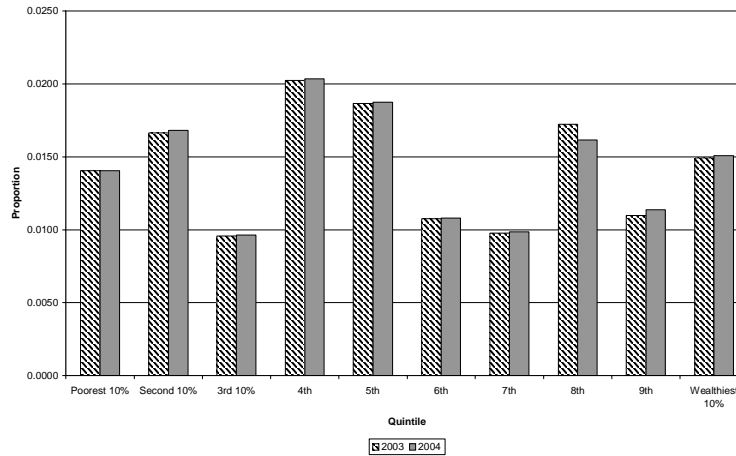
Figure 3: Enrolment by district wealth quintiles



the bursary. This could imply that the formula used to distribute bursaries from the Ministry of Education headquarters to the constituency level is equitable as it factors in the poverty incidence levels of each constituency in addition to enrolment levels.

However, the distribution shows some evidence of inequality. The 5th and 4th quintiles receive relatively higher amounts than the 1st, 2nd and 3rd quintiles. The calculations are based on the amount shared among all constituencies and the districts in the Arid and Semi Arid Lands (ASALs) and areas that fall under pockets of poverty (most of which are under the 1st, 2nd and 3rd quintiles and also receive grants for development purpose under the Core Poverty Programmes). For instance, in November 2005, secondary schools in ASALs received Ksh 70 million while those in pockets of poverty received Ksh 45 million in the 2005/06 financial year (Ministry of Education, 2007b). Perhaps the low enrolment in ASAL areas can be attributed to limited physical infrastructure and retrogressive socio-cultural factors that constrain enrolment.

In the past, bursary award to the beneficiaries used to be done at the school level, but it is currently done at constituency level. In fiscal year 2005/06, official criteria for bursary allocation to constituencies was reviewed to take into account constituency enrolment and poverty levels. Thus, constituency bursary allocation is computed using the following formulae: Total Ministry bursary allocation, multiplied with constituency secondary school enrolment as a proportion of national secondary enrolment,

Figure 4: Proportion of bursary by wealth district quintile

multiplied with constituency poverty as a proportion of national poverty incidence (Ministry of Education, 2005). There is also affirmative action to ensure that in any given disbursement, ASAL constituencies are allocated at the least Ksh 500,000. Although there is a criteria on factors to consider when identifying target beneficiary groups, it has been criticized for being inefficient and weak in identification processes (Ministry of Planning and National Development, *et al.*, 2004; and KIPPRA, 2006a). Expected target groups include orphans, children from poor households, children from ASAL areas and slums, girls and children in special circumstances especially those with special needs and those rescued from difficult circumstances.

Widespread ineffectiveness in the beneficiary selection has been reported at the local level (Ministry of Education, 2006a; Ministry of Planning and National Development, *et al.*, 2004). Following persistent complaints of the inadequate allocation to a beneficiary, the Ministry issued guidelines for minimum allocation to a beneficiary. To avoid token bursary awards, which may not adequately sustain retention and completion, the minimum allocations to beneficiaries in national, provincial and day schools are set at Ksh 15,000, Ksh 10,000 and Ksh 5,000, respectively (Ministry of Education, 2006a). However, the Ministry of Planning and National Development study showed that the criterion for allocation of the funds was not strictly adhered to. In the sample of beneficiary parents (based on their declared income), about 22 per cent were in the top quintile compared to only 6 per cent in the bottom quintile, while the mode (40% of the total parents) was in the middle income bracket (Ministry of Planning and National Development, *et al.*, 2004).

Given the relatively high fee levels in secondary schools, it is evident that the set minimum bursary award is far below the fees charged, leading to some beneficiaries dropping out. The parents and school managers have publicly stated that schools countrywide were owed about Ksh 10 billion in fees arrears by 2006. This has two immediate implications that are of policy concern to parents, education managers and the government. One, a student who completes secondary school education while in fees arrears (a defaulter) is most likely to be denied access to the school certificate by the affected school and two, the school cannot fully implement its development plan, which is normally financed from revenue mainly collected from fees.

The emerging issue here is on the effectiveness of targeting process in order to identify the needy students and/or household (World Bank, 2007). There has been numerous complains on the ability of the Constituency Bursary Committee (CBC) to effectively target the intended beneficiary. In addition, the ineffectiveness of this process is manifested in the large number of Standard 8 pupils selected to join F1 but a significant number fail to enrol due to various reasons, the main one being lack of school fees. For instance, out of the 0.675 million Std 8 candidates in 2005, only 0.241 were enrolled in F1 in 2006 although the number admitted (F1 selection) was more than 0.380 million, which is about 57 per cent (*unpublished Ministry of Education dataset*). Fortunately, the Ministry of Education has realised this problem and instituted an intervention whereby the 2007 bursary was released immediately after admission to F1 had been done. This gave F1 students a chance to apply for the bursary. The impact of this policy decision will be known once the schools give their enrolment returns for February and/or March 2007.

While the Ministry should be lauded for attempting to target F1 pupils and therefore increase the real transition rate, the problem is unlikely to go away because of two reasons. *First*, the policy decision did not affect the way the Constituency Bursary Committee (CBC) transacts its business and may, therefore, be compromised by the CBC management inefficiency. *Two*, it is possible that there are pupils who are financially challenged, and who do not attempt to report to the school they were admitted (to F1) due to information asymmetry and lack of money for transport and personal effects. The policy questions that education management has to deal with are twofold: How can the CBC improve targeting and therefore make the bursary more effective? Would shifting the Form 1 identification process for bursary allocation from F1 to target Std 8 candidates during their final term in school improve the effectiveness of the bursary?

While there are no immediate answers to these questions, the paper attempts to review some of the targeting approaches (later in this chapter)

in use for social funds world over with a view to informing the beneficiary selection processes. In the latter question, if the Ministry of Education expects to make effective gains in the bursary process by allowing the F1 admission process to be completed, then focusing on Std 8 (during their final term) could yield even better results and perhaps improve real transition rates.

From Table 3, in 2005, the standard eight candidates were in excess of the available school places in all provinces. Central Province had the highest (65%) available places while North Eastern had the lowest (31%). At district level, Mandera District had the lowest proportion of F1 school places while Meru South had the highest (113%). Overall, all the secondary school capacity to absorb F1 students stood at 59 per cent. This is an indication that more school places are required in order to achieve higher transition rates from primary to secondary.

Fees guidelines and parental expenditure in secondary education

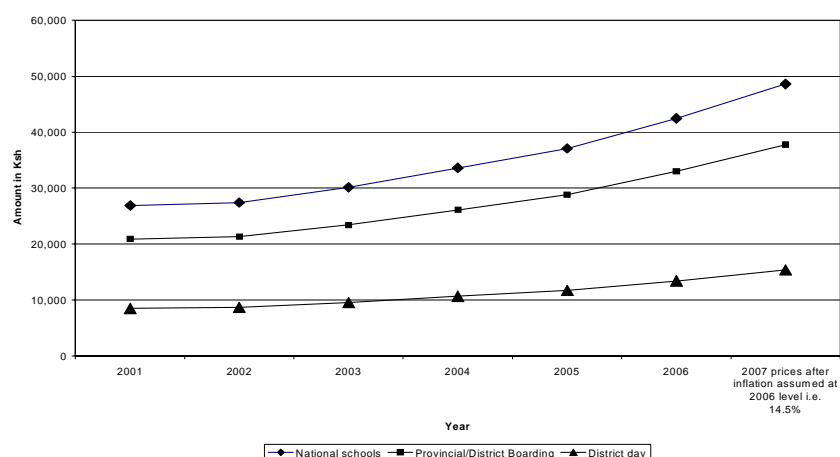
Why is secondary school fees perceived to be high? Several reasons have been linked to high cost of education, including cost of students upkeep, related inputs, cost of learning inputs, teacher salaries, school administrative inefficiency and Ministry of Education fees guidelines among others. From a policy perspective, simply how does the Ministry of Education fee policy guideline lead to escalating secondary education fees? Table 4 and Figure 5 show fees guidelines and how they are projected to grow given the general

Table 3: Available F1 school places in 2006 as a proportion of number of KCPE candidates in 2005

Province	Mean % for province	Minimum in a district (%)	Maximum in a district (%)
Central	65	54	79
Eastern	63	36	113
Nyanza	63	47	78
Western	61	52	72
Coast	54	46	70
Rift Valley	54	39	71
Nairobi	42	42	42
North Eastern	31	14	51
National	59	14	113

Data Source: Author's computation; Ministry of Education presentation during the KESSP Joint Review Mission on Budget Workshop (March 2007).

Figure 5: Inflationary changes of 2001 Ministry of Education school fees guidelines



economic conditions in the country. Using the inflation rate to reflect such economic conditions, the 2001 fee guidelines are expected to have increased by 81 per cent by 2007. Comparing the inflated fee guidelines and what the schools are charging, one finds that it is only the district day schools that can be said to be over-charging by Ksh 3,200 per year on average, despite them being perceived as cheaper. This 'overcharging' could be associated with management inefficiency. Provincial and district boarding schools are actually not over-charging going by the current value of the fees guidelines.

However, despite schools factoring in inflation in their fees setting mechanism, the issue of high fees still remains. Assuming that school managers act rationally, one would expect them to factor in inflation as they set their fees levels, which is shown to be happening (see fees for national schools in 2007). It, therefore, follows that fees guidelines and perhaps how they were formulated are partly responsible for high secondary fees, though they were intended to control it. In our analysis, we have no information on the considerations made to set the guidelines. However, it seems they do not reflect all non-teacher unit cost of secondary education (which they were supposed to). In other words, school fees charged by secondary schools simply reflect the Ministry guidelines, with inflation rates having been factored in rather than the cost of non-teacher inputs. It is, therefore, imperative for the Ministry of Education to establish the cost of non-teacher inputs with a view to revising the fees guidelines and/or understanding the non-teacher market unit costs of secondary education. This implies that a national school in a rural region should not be charging similar fees to a

Table 4: Public secondary school fees schedule, 2001-2006

Ministry of Education fee guidelines/ 2001	2001	2002	2003	2004	2005	2006	2007 expected fees after inflation assumed at 2006 level i.e. 14.5%	Actual Average fees in 2007	Difference between actual and expected fee 2007*
Inflation rate	5.8	2.0	9.8	11.6	10.3	14.5	14.5		
School category	Ministry of Education fees guidelines in Ksh after factoring in inflation								
National schools	26,900	27,438	30,127	33,622	37,085	42,462	48,619	48,806	187
Provincial/District Boarding	20,900	21,318	23,407	26,122	28,813	32,991	37,775	31,362	-6,413
District day	8,500	8,670	9,520	10,624	11,718	13,417	15,363	18,563	3,200

Source: Ministry of Education fees guidelines and Authors Computations

Notes: * Expected fee after taking into account overall inflation. Positive difference shows that the schools are charging above the expected while a negative difference shows that schools are charging below the expected, on average.

similar school in an urban setting. There are some significant price differences of various school inputs that would make one school cheaper than the other.

Parents in public and private secondary schools are expected to spend about Ksh 29.3 billion in secondary schools in 2007. This is much more than the Government of Kenya expenditure in secondary education, which stands at slightly over Ksh 24 billion. However, this figure (Ksh 29.3 billion) does not reflect what the Government of Kenya should take over if FSE were to be introduced. This is because the figure is based on what schools charge and not necessary the cost of school inputs. The hypothesis is that the cost would be lower.

2.3 Approaches for Targeting the Vulnerable and the Poor

In Kenya, one of the Core Poverty Programmes in the secondary education sub-sector is the secondary school bursary, which targets students from poor backgrounds and those included in an affirmative action, such as the girl child (Ministry of Education, undated—b). Targeting is used as an instrument to achieve universal access to this public service. In the past, there has been public complaints on the effectiveness of the selection process, which has been labelled as inefficient and unable to target students from families that are vulnerable and/or poor. However, available literature shows that, even where the criteria for selection is highly designed, it is possible to experience inefficiency in the implementation of the targeting mechanisms (Samson, *et al.*, 2006; and Coady, *et al.*, 2004). Nevertheless, there exists no consensus on the best way to target people who are vulnerable or poor. This section, therefore, presents evidence that can shed more light on the available mechanisms with a view to informing the secondary school bursary disbursement process in Kenya. Given that targeting includes selecting from a wider group of people or community, transparency of targeting mechanisms is critical for the process to gain legitimacy among community members. It is therefore imperative for any targeting mechanism of choice to meet this criterion.

Targeting in the context of secondary school bursary can be viewed as the process by which bursary funds are effectively distributed to pupils who are poor and vulnerable. Past studies have identified emerging typology of targeting approaches, which include geographical targeting, proxy-means testing, self-targeting, characteristic targeting and community targeting (IFAD, 2007; Samson, *et al.*, 2006; Castaneda, 2005; Coady, *et al.*, 2004; Rawlings, *et al.*, 2004; and Malik & Chanthu, 2003).

Geographical targeting

This is a formal targeting that involves the channeling of resources to geographical areas identified as having high poverty rates. It follows poverty mapping exercises that show poverty incidences by some recognized administrative boundaries such as municipalities as in Colombia and Peru, provinces as in Armenia, districts as in Zambia and constituencies as in Kenya (CBS, 2005; Rawlings, *et al.*, 2004; and Malik & Chanthy, 2003).

The effectiveness of this approach partly depends on the accuracy of poverty incidence data and the extent of concentration of the poor in certain geographic areas. Availability of data on appropriateness of quality and adequacy of coverage in terms of relevant units, such as villages and households, makes this approach more dependable. The main purpose of geographical targeting is to identify administrative units or locations that should benefit in a way that equity principles are observed. However, the poor are not always concentrated within one administrative unit or location. Consequently, geographical targeting is subject to errors of exclusion and inclusion, especially in countries with high levels of inequality (Coady, *et al.*, 2004).

In Kenya, income disparities are relatively high. Any exclusive geographical targeting will include many non-poor households while excluding regions that nonetheless contain many people who are vulnerable and poor. The allocation of secondary school bursary to constituencies takes into account the poverty incidence and secondary school enrolment in the constituency. As a result, the distribution of bursary funds up to the constituency level has been relatively equitable, as evidenced earlier on Figure 4. Given that constituencies do not constitute a homogenous group and that the supply of bursary funds does not meet the demand, geographical targeting in this case is only applicable in as far as determining the amount of funds to be allocated to a constituency. It, therefore, becomes necessary to use other targeting mechanisms to identify the beneficiaries.

Means testing

Individual assessment, including means testing and proxy means-testing, is the other traditional and formal targeting approach that is widely used for identifying individuals or households for the purposes of benefiting from social funds. It is normally done by trained personnel and involves an assessment of the applicants' socio-economic conditions on the basis of questions answered by the applicants and sometimes on the basis of a home visit (mainly to confirm the responses). The aim here is to come up with a single index based on the individual's socio-economic characteristics to

determine whether the individual or household satisfies the criteria for qualification. This approach has been used for various purposes, including access to scholarships, hospital insurance, water and electricity subsidies, and cash transfers, among others (IFAD, 2007; Samson, *et al.*, 2006; Castaneda, 2005; Coady, *et al.*, 2004; Rawlings, *et al.*, 2004; and Malik & Chanthy, 2003).

However, the approach is expensive especially in countries that do not have in place a systematic social protection system that identifies individuals who are vulnerable or poor. This is because it may require social workers to carry out a survey with a view to identifying the beneficiaries. Alternatively, potential beneficiaries go to a central place for registration by way of completing a form that requires them to provide details on their socio-economic status. The status is proxied by a number of indicators or characteristics, whose effects and significance in determining the status is pre-determined using econometric analysis. While these data collection methods are applicable in a wide range of programmes, sometimes they can be subjective and expensive to apply, and experience many difficulties when applied in schemes that attempt to benefit a large number of beneficiaries, such as the secondary school bursary in Kenya. For instance, the calculated index is based on the information supplied by the applicant and certified by individuals and/or officers, who in most cases could be pro-applicant (see (Ministry of Education, undated—b). All in all, means testing is one of the most effective targeting, but is relatively expensive.

In Kenya, the secondary school bursary scheme uses a proxy-mean testing approach to identify the beneficiaries within a constituency. This process is conducted by a Constituency Bursary Committee (CBC) constituted based on the guidelines from the Ministry of Education. It is not clear how well the proxies used ((Ministry of Education, undated—b) represent the determinants of the social economic characteristics of the individual. In the recent past, some studies have raised questions on the competency and objectivity of the CBC in identifying students who are vulnerable and/or poor (KIPPRA, 2006a; Ministry of Planning and National Development, *et al.*, 2004). However, the proxies have attempted to use combined poverty and vulnerability indicators in order to reduce biasness and improve the effectiveness of the intervention. Ideally, such indicators should be easily observable and verifiable, distinguishable between a large number of households or individuals and between people who are poor and non-poor (vulnerable and non-vulnerable), not too highly correlated and constant over time. What is emerging from this literature is that the bursary scheme in Kenya uses a conventional approach to target; however, its operationalization is muddled in transparency problem. It is important to recall here that for a

targeting approach to be viewed as legitimate, it must qualify the participatory and transparency criteria.

Self-targeting

Self-targeting is an informal targeting approach that is characterized by self-selection due to the difference in reaction between the targeted group and the non-targeted group. People who are vulnerable and poor will react differently from non-poor when confronted with certain types of subsidies or interventions (Malik & Chanthy, 2003). For instance, food for work programmes will attract people who are poor. In education, removal of formal fees in primary schooling increases enrollment of children from poor households in relatively high proportions. In the education bursary scheme in Kenya, self-targeting is not applicable as individuals and households who are non-poor may want to benefit from such funds in order to boost their consumption. However, there have been no experiments on the success of programmes such as bursary-for-work, with say parents working on behalf of their children. With funds such as Local Authority Transfer Fund (LATF), CDF and Roads 2000, this sounds very practical.

Characteristic targeting

Characteristic targeting or household targeting calls for a clear identification of the indicators or characteristics that define the beneficiaries. It is more applicable to households whereby a combination of household characteristics are used to determine the household's eligibility to the benefit, for instance landlessness, female-headed household, and child-headed household, among others. The strength of characteristic targeting is based on the fact that obtaining reliable information on income and assets for individual assessments is difficult. This targeting approach relies on observable traits that can easily be linked to poverty. The approach is normally used with the means testing as an entry point and/or to verify information for the mean testing targeting (Rawlings, *et al.*, 2004). The characteristics used are normally defined by experts in consultation with potential beneficiaries. Looking at secondary school bursary application (Ministry of Education, undated—a), part A requires the applicant to provide information on family status. These are aspects of characteristic targeting.

Community targeting or direct targeting

Community targeting is an informal targeting approach mainly practiced by communities with the help of civil societies. It involves the local

community legitimate representatives defining poverty in the local context. These local representatives are also charged with the responsibility of identifying potential beneficiaries from their communities. Community targeting approach is very participatory, thus taking advantage of local ownership and control to legitimize the outcomes (Samson, 2006). However, this approach, like all the others, has risks. It is not immune to local elites who are known to manipulate community initiatives. The closeness of potential beneficiaries to the representatives or 'judges' may compromise objectivity.

From the foregoing, there is no single targeting approach that is comprehensive enough in a way that it will target all the intended beneficiaries. Use of a combination of targeting approaches returns more preferable results and such a practice is encouraged. The effectiveness of targeting partly depends on the choice of the approach as well as the implementation processes of that approach. Using 'best' or conventional targeting approaches is, therefore, not a guarantee that targeting will be effective.

2.4 Core Poverty Programmes in Secondary Education

As a commitment to poverty reduction, the government has identified key focus programmes for investment. Apart from the bursary scheme, there are other programmes under secondary education aimed at poverty alleviation and improvement of quality of education. Such programmes include: science equipment/laboratory in targeted schools, grants to ASALs secondary schools and grants in aid of schools in pockets of poverty (Ministry of Education, 2006a, and 2007a). Under the science equipment, started in the 2003/04 fiscal year, each of the beneficiary schools received Ksh 227,456 in 2005/06 with 10 schools being targeted in each district. This initiative has enabled the improvement of teaching and learning materials in science subjects, hence improvement of the quality of education. In addition, the move is expected to reduce the parental cost of school inputs. However, this paper has not come across any information to suggest that such benefits are transferred to parents in the form of reduced school fees, although this is the likely implication.

Public secondary schools in ASALs benefited from a grant of Ksh 40 million in the 2003/04 fiscal year and Ksh 70 million in 2005. The grants were distributed to schools based on enrolment levels. Through affirmative action, schools in the ASAL districts of Mandera, Wajir, Ijara, Garissa, Moyale, Marsabit and Isiolo received enhanced allocation. Each school

received at least Ksh 100,000 regardless of student enrolment and have thus, gone a long way to improve the infrastructure in the beneficiary schools.

Schools in need of assistance are not limited to ASAL districts. Pockets of poverty are common in Kenya due to wealth inequalities and sudden physical/natural environment endowment. The Ministry of Education has set aside grants to aid secondary schools in pockets of poverty in 43 non-ASAL districts country wide, with schools being identified by the District Education Boards. The allocation for 2003/04, 2004/05 and 2005/06 fiscal years were Ksh 27, 30 and Ksh 45 million respectively. In the 2005/06 fiscal year, some schools received as much as Ksh 320,930. Given that Core Poverty Programme (CPP) grants to secondary education target relatively poor districts and ASALs, which are likely to be owed fees arrears by parents, it is unlikely that their school management would lower school fees because they have received grants from the Ministry of Education.

2.5 Experiences from Other Countries

As countries strive towards the achievement of universal primary education, the demand for secondary education has been increasing. This has forced countries to carry out reforms in the secondary education system so as to improve transitions from primary to secondary school. For instance, in some countries, secondary education has been demarcated into lower and upper secondary whereas others (like USA) have a comprehensive secondary education and have reduced the elitist nature of secondary education that was espoused in some countries.

In the Scadinavian countries (Norway, Denmark, and Sweden), primary and middle schools were joined into a nine-year basic and compulsory programme. Great Britain, France and Italy have reformed and adopted a mixed secondary school system (Benavot, 2006).

After the end of the colonial era, few African governments altered the education systems that were in place during the colonial period. Secondary education continued to be more accessible to the elites. Examinations continued to be the measure of transition from primary to secondary school. This limited the chances of children enrolling in secondary school, hence

the problem of access to secondary education that has never been addressed in the current secondary education system (Benavot, 2006). This has been the case in Kenya. The following case studies provide some valuable insights as Kenya embarks on expansion of secondary education.

Zimbabwe¹

Zimbabwe does not in itself provide any successful case for secondary education in Africa. However, there are some policies that have been put in place in the past that, if well followed, can lead to successful expansion of secondary education. For instance, in Zimbabwe, there is a policy of automatic promotion from Grade 1 up to Form 4. There is no selection examination of pupils to join Form 1 as long they can afford. It is only in 'A' level where there is selection because it is very competitive. The government's policy is that no child should be denied access to secondary education as long as he/she can afford fees. Those joining Form 1 are supposed to join the nearest school to their place of residence.

The automatic progression is a very important policy direction. South Korea's expansion of secondary education was successful because of seeing through the success of such a policy. However, in Zimbabwe, the policy seems to have failed because of the fees charged.

In Zimbabwe, the government has been the main provider of secondary education in urban areas throughout the country. In rural areas, it has undertaken to build one government rural day secondary school in each district. The government gives subsidies to local authorities for construction of additional rural secondary schools. It has also devolved the provision of capital infrastructure for schools to local authorities and communities, reducing its role to authorization, registration, payment of teachers' salaries (for both government and non-government schools) and provision of pupil per-capita grants to all registered schools (Manduvi and Lewin, 2001). For maintenance, equipment, learning materials and other recurrent costs, the government covers the costs for only its sponsored schools.

During the expansion period, the government of Zimbabwe introduced double shifting, which increased capacity by making use of existing school buildings and reduced capital requirements, hence saving on capital costs. This saw enrolment in secondary school rise to about 40 per cent. However,

¹ Most of the information is heavily borrowed from Manduvi-Moyo and Lewin, in Lewin and Caillods (2001).

attrition throughout secondary, especially among the poor and girls, remains a problem due to the high fees charged, among other factors.

Malawi

The performance of Malawi's secondary education sector is very dismal because the GER is around 10 per cent. However, the government of Malawi has initiated several strategies towards the expansion of secondary education which, if they succeed, will see a rise in enrolment. Thus, several positive things can be learnt from Malawi.

For instance, in Malawi, there exists different categories of secondary schools as noted in Lewin (2001). There is the government boarding, which are funded from the Ministry of Education budget although boarding is provided at nominal cost to pupils; government day schools, where boarding is also common but is partly financed from fees; and grant-aided schools, which receive subsidy from government (on the basis of the number of students, the proportion of boarders and other special features they may be having). School fees are charged at different rates for the different categories of schools although government boarding schools have an official rate. The fees charged include tuition, boarding and a general fee.

Firstly, it can be noted that school fees in government schools in Malawi are minimal and estimated at between 5-15 per cent of actual costs, with other costs being borne publicly. Secondly, private schools have developed rapidly and account for around 15 per cent of total enrolment. Thirdly, boarding is widespread and is the preferred method of schooling. However, it is heavily subsidized in government schools (Lewin, 2001).

Government secondary schools are, however, typically small, hence suffer from dis-economies of scale. Due to limited places in secondary schools, there have been experiments of double shifting in a limited number of government schools. The objective is to make efficient use of available physical facilities. The system reduces overheads associated with buildings and equipment. However, this strategy is not popular with parents although teachers have a preference due to the shorter teaching hours, as they are not extensively used. This means that the system is not saving much in terms of recurrent costs on salaries.

Malawi may have learnt from the Mozambican experience with double and triple shifts. In Mozambique, lack of places in secondary schools resulted into starting evening classes. For instance, in 2005 the number of junior and senior schools providing evening courses each increased by 11 per cent; 32 per cent of the lower secondary and 42 per cent of the senior secondary

students attended night classes. Many schools in Mozambique have three shifts offering morning, afternoon, and evening classes. Each school has one headteacher, assisted by one or two deputies for each of the shifts. There are cases where extra teachers are hired on contract for the evening classes, but most are the same as in day classes. Teachers who do not teach a full load in day classes have to do so in night classes, working up to half of the normal teaching load as extra hours. Night hours are paid 1.5 times the regular hourly salary. Night students only have 5 classes of 45 minutes 5 days a week, compared to 6 classes for students of day classes. Fees for evening classes are higher than those of day courses.

However, lack of supervision and low level of discipline among staff creates additional problems. Quality is low, and almost 30 per cent of the students of each grade repeat or drop out per year. Completion rates are also very low.

Burkina Faso

There are several things that Burkina Faso secondary education system offers. First, the Ministry of Education in Burkina Faso controls the number of pupils entering both lower and upper secondary levels through an examination where a pupil has to score marks above a certain threshold to be admitted into a state secondary school. Those with slightly lower marks are admitted into private schools with some government support.

Secondly, tuition is free for those who have passed entrance examination (although they pay a contribution to the parents' association) whereas those who have not but are admitted by applying directly to the heads of the secondary schools have to pay a fee and also contribute to the parents' association. This is aimed at enabling the association to buy materials or pay salaries for temporary teachers.

Thirdly, private sector participation is a bit higher with enrolment in private schools being about 30 per cent (Manduvi and Kevin, 2001).

Cote d'Ivoire

Cote d'Ivoire has a relatively well-developed secondary education as noted by Caillods (2001), attributed to its high level of economic development. The education system in this country consists of 6 years in primary, 4 years in lower secondary and 3 years in upper secondary. In the 1990s, Cote d'Ivoire was spending nearly 36 per cent of its government budget on secondary education because of the relatively high educational unit costs. Cote d'Ivoire reduced the unit costs of education by reducing the number of

teachers per class and lowering the salaries of teachers who joined the civil service.

The private sector has also been developing due to policies that created an enabling environment for its operations. These include: simplified procedures for opening a school, tax exemptions, and provision of subsidies to some schools, among others. The government of Cote d'Ivoire has an innovative way of increasing the supply of publicly-financed places in secondary schools by buying places in private catholic and protestant schools, where they have a contract. The Ministry then pays fees for pupils who have passed the entrance examination but lack places in public schools. The government of Cote d'Ivoire also trains private school teachers and sometimes allocates its teachers a few hours to teach at lower rates in private schools. This is almost similar to what is practised in Madagascar, where the government subsidizes some private schools, numbering about two-thirds of those registered. This has led to a well-developed private sector in Madagascar, which enrolls nearly half of the students at the upper secondary school level because of the incapacity of the government to offer sufficient places in state schools.

Caillods (2001) indicates that there are no fees in all public schools in Cote d'Ivoire. However, students pay for textbooks, uniforms, and transportation. The number of pupils entering secondary levels is controlled by the Ministry of Education through an entrance examination after six years in primary school.

Sri Lanka²

Sri Lanka achieved a GER of 66 per cent in secondary schools in the 1980s besides being a low-income country. It is one of the low-income countries that provide high levels of access to secondary education (Lewin and Mallawarachchi, 2001). The success of Sri Lanka to expand access to education is not attributed to unusually large allocations of funds. It has always invested around 3.5 per cent of GNP in education and not more than 10 per cent of government expenditure.

The history of education in Sri Lanka dates back to the pre-colonial era when education was provided in Buddhist and Hindu temples and mosques. During the colonial period, elementary education became compulsory and at independence all schools became government schools. However, the

² This section borrows heavily from Chapter 9 of Lewin and Caillods, in Lewin and Mallawarachchi (2001).

devolvement of school management played a key role (Lewin and Mallawarachchi, 2001). In 1987, the responsibility for education was devolved to provincial authorities, leaving only the 'National Schools' to be directly administered by the Ministry of Education and Higher Education. The Ministry of Education does only curriculum development, production of textbooks and teacher training.

Sri Lanka has an integrated system of education, where secondary schools have primary sections. There is an open access to schooling up to grade 10. The flow of students through the education system in Sri Lanka is not restricted through selection tests up to Grade 11. This implies that a student has direct promotion from one grade to another for 11 years of education (O-level). Grade 11 is past the junior secondary cycle (6-8) and marks the end of 'O' level section. Grade 12 and 13 (A-level) is where students sit an entry examination to determine entry to university.

Sri Lanka has a policy of free education from grades 1 to 13. Schools are well distributed throughout the country and primary school children rarely travel more than 4 kilometres to the nearest school. There is a free textbook scheme for all children in grades 1-11, which was introduced as early as 1980s. Textbooks at secondary level are not free but are subsidized. Free uniforms are provided, and there are noon time meals provided as part of a universal benefit. It is estimated that subsidies—meals, scholarships, and uniforms—was accounting for as much as 30 per cent of recurrent expenditure as per 1997. Small facilities fees are charged per month but on a discretionary basis.

In Sri Lanka, there are several sources that are explored for the financing of the school system. Firstly, the central government provides the bulk of all funding. However, the provincial governments allocate additional funds over and above what is provided by the central government especially for payment of salaries. About 75 per cent of non-salary expenditure is allocated to uniform subsidies and textbooks, and about 10 per cent to sports equipment and activities. Secondly, households also contribute to education in Sri Lanka but mainly for stationery, uniforms and private tuition in that order. Fees and other community contributions have not been significant in financing expanded access, with fees generating not more than 3 per cent of recurrent costs. The communities support the schools budget through contributions of facilities fees levied on pupils according to guidelines that allow for discretion in payment for those who are unable to pay. Thirdly, there is also external assistance in education, which is mainly development expenditure that is extended through the public investment programme by development partners.

Most secondary schools have primary schools as well, which even have some overlap of teaching. This lowers the unit costs of secondary education

as there are shared resources and facilities. The schools benefit from economies of scale, especially on fixed costs and sharing of staff across grades. This integrated system ensures that the system sustains high secondary enrolment rates at affordable levels.

There is an effective national textbook subsidy scheme, which reduces the cost of providing learning material and simplifies its production and distribution. Therefore, even with low levels of non-salary expenditure, basic textbooks are available. Some schools fill the gap in the low non-salary expenditure through the facilities fees and from school development society activities. However, this does not happen in all schools, as the fees are very discretionary.

Enrolment gains have been achieved in a context of low growth of demographic transition. This has reduced the demand for new teachers and buildings considerably.

Costa Rica³

Costa Rica is one of the more equitable societies in Latin America. Costa Rica provides a guaranteed free primary and secondary education to all citizens as stipulated in the country's constitution. The secondary education system in Costa Rica is structured in a parallel system of academic (80%) and technical (20%) streams.

The secondary cycle runs for three years in lower secondary, which is compulsory, although attendance is not fully enforced, and two years in upper secondary, which is not compulsory. The bulk of the education is provided through public funds and education sector allocations of around 6 per cent of GDP every year as stipulated in the constitution. The constitutional clause guarantees the proceeds of an earmarked tax. However, a large proportion of the education budget ends up being spent on higher education than on the entire secondary school education.

Per capita expenditure on secondary education is low, as indicated by low unit costs. This implies that secondary school costs are not obviously a constraint on secondary participation. However, a high proportion of resources is spent on recurrent expenditure (at between 90 to 95%) at the expense of capital expenditure. This expenditure pattern affects the quality of education because limited resources are directed to infrastructure and facilities for teachers and pupils; hence affecting their motivation. Lack of

³ This section borrows heavily from Chapter 9 of Lewin and Caillods, in Lewin and Mallawarachchi (2001).

adequate resources allocated for non-salary spending may also mean shortages of teaching and learning materials, hence, the overall effect of poor performance, which may lead to high drop-out rates and retention problem.

In Costa Rica, buying of textbooks has traditionally been in the hands of parents. Large distances result in poor attendance as transport is a role left to parents, although the government provides for some few in rural areas. Thus, there are high direct costs from uniforms, textbooks, stationery, contributions for teachers' supplies, and transport. These represent almost 44 per cent of an average monthly income for one student.

Private education accounts for about 10 per cent of secondary school enrolment. Private education is funded through tuition fee charged to students.

United States of America⁴

Most of the industrialized countries today had made considerable strides in providing basic education up to age 14 by the start of the twentieth century. For instance, the US was close to universal enrolment in a 9 year elementary programme.

Strategies for expansion of education opportunities were distinctly different in the US and Europe. The transformation from elite to a mass system of secondary education occurred in the first half of the twentieth century in the US, in the 1970s and 1980s in Europe, and in the later part of the century in East Asia.

Around 1900, the US had reached universal primary enrolment for the 7-13 age group. However, secondary (high school) enrolment remained reserved largely for the elite. For instance, by 1900, only about 6 per cent of the adult population had completed high school; high schools enrolled about 10 per cent of the 14-17 year olds. However, this situation had changed dramatically by 1940. Enrolments for 14 to 17 year olds increased more than tenfold or 75 per cent. More than 25 per cent of the adult population had completed 12 years of education. The move towards mass secondary education had several defining features. It was:

- (i) Publicly funded;
- (ii) Managed by numerous small fiscally independent districts;

⁴ The literature on USA, Europe, and Asia has been synthesized from Secondary Education in Africa (SEIA) 2007 Report: *At the Crossroads: Choices for Secondary Education in Sub-Saharan Africa*.

- (iii) Academic yet practical in its curriculum;
- (iv) Secular in control; and
- (v) Gender neutral in admissions.

In 1910 revenue for education was 80 per cent local with only 10 per cent provided by the State. By 1940, local districts still raised 70 per cent of the funding for education.

The increase in high school enrolments by 1940s was accompanied by improvements in the learning environment. Pupil Teacher Ratio (PTR) had improved to about 27:1; cost per student enrolled increased to 15 per cent of GNP per capita and teachers' salaries had increased to about 2.5 times GNP per capita. In 1955, the secondary enrolment rate in the US had increased to 80 per cent.

Europe

Europe had different systems of education although there were some common features in the development of the education system, especially in Western Europe. Most countries had centralized bureaucracies and financing. It was only in the 1960s after World War II recovery and some positive economic growth experiences that secondary school systems were redesigned to respond to equity concerns and new labour market demands. Junior secondary education became a compulsory part of basic education and selection exams at the end of the primary education were dropped. Access, retention and transition policies focussed more on keeping the students in the system rather than selecting them out.

During the mid 1990s, most OECD countries started implementing major structural reforms at secondary school level, which resulted into the raising of achievement levels and reducing the gap between different groups. Information and Communication Technology (ICT) became a major focus as both a subject and a tool for learning at the secondary level. Repetition practices were restricted as countries offered a direct and automatic access to junior and senior secondary to the whole age cohort without any admission requirements—facilitating access and transition to secondary education. Management and governance of the education systems was decentralized, allowing secondary schools to become autonomous and make context-specific decisions regarding programmes, curricula and financing.

The role of the private sector as provider, manager, and financier was enhanced and pro-actively encouraged by governments. For instance, in Netherlands, 75 per cent of the schools are private (but publicly-funded). Most private schools receive public subsidies or contributions from business, especially for technical vocational programmes. Most private schools are religious or schools with an alternative pedagogical philosophy. Hence, the private sector has continued to play an important role in provision of secondary education.

Asia

Large increases in expenditures on education resulted into higher enrolment levels in Asia than in other countries with similar levels of GDP per capita.

In 1965, Hong Kong, Korea and Singapore had already achieved universal primary education. By the late 1980s, significant progress at the secondary level was evident in several countries. Korea, for example, increased its secondary enrolment rate from 35 per cent in 1970 to 90 per cent in 1990. By 1990, the Philippines had 71 per cent gross enrolment in secondary level up from 46 per cent in 1970.

The following factors are attributed to the extraordinary change in the education expansion in East Asia. First, the high income growth rate of 7-10 per cent from 1960 to 1970 increased the resources available for education. Second, demographic transitions ensured a low population growth rate, hence saving resources for more and better schooling and allowing substantial increases in per student expenditures. Third, equity in distribution of income ensured that the poor, who would not otherwise afford education expenditures, were taken care of. Four, government commitment to providing resources to education was witnessed through the high overall budgetary allocations, especially to secondary education. Lastly, in the early stages of mass enrolment, alternative modes of delivery, such as double shifts, were utilized due to lack of classrooms. Singapore ended double shift use of facilities in 2003.

Thailand

Until 1970, most of the focus in Thailand was primary education. Secondary education was only reserved for civil servants, professionals and teachers. However, because of challenges brought about by modernization in the recent years, Thailand re-conceptualized secondary education as basic education, leading to expansion of compulsory education from 6 to 9 years.

Thailand's strategy for expansion of secondary education focused on expansion of existing primary schools, building of new schools, revising of admission policy, and abolition of tuition fees, among others. Thus, initially, more than 4,000 primary schools were expanded to have lower secondary. The under-utilized primary school facilities resulting from a declining birth rate were also converted into secondary schools. Over 500 new secondary schools were established in rural areas where no secondary or extended primary schools existed.

To make the system less restrictive and also promote access, the highly competitive admission policy of the exclusive secondary schools was revised so that there were opportunities for students from different backgrounds to enrol. Tuition fees, which also hindered access was gradually abolished, starting with the extended primary schools and rural secondary schools. Besides, the government recognized alternative forms of education, including recognition of graduates from non-formal education and establishing special schools for the disabled. The result of this was witnessed by 2005 when secondary enrolment ratio exceeded 70 per cent with lower secondary education being almost universal and enrolling 90 per cent of the age group.

Korea⁵

In 1960, Korea was a low income country with a GDP per capita equivalent to African countries such as Ghana.⁶ By 1965, South Korea had reached universal primary education and by 1990, secondary enrolment had increased to 90 per cent from 35 per cent in 1965.

The school system in Korea starts with a mandatory 6 years of elementary school and then mandatory 3 years of the middle school that form the first segment of secondary education. Selection examinations were abolished in these two segments of the education system to increase access and transition to lower secondary education. It is only the admission to high school that is determined through a selection examination. Entrance has reached about 99 per cent for the middle school (Gwang-jo Kim, 2002).⁷ Private schools

⁵Additional literature on Korea comes from the following link: Korea's Education System. Part II, Accessed on 23rd July 2007 <http://english.keris.or.kr/ICSFiles/afieldfile/2005/12/12/part22004.pdf>

⁶ By 2000, its economy was ranked 12th in the world.

⁷ Education Policies and Reform in South Korea, in *Secondary Education in Africa: Strategies for Renewal*. World Bank Presentations at the December 2001 UNESCO/BREDA-World Bank Regional Workshop in Mauritius on the Renewal of African Secondary Education, 2002.

also enrol a significant proportion of the students. As of the year 2000, private secondary schools enrolled 20 per cent of the students in junior secondary schools, and 55 per cent in senior secondary school.

During the period 1960s and mid-1970s, educational policy in Korea focused on expanding basic educational opportunities to all eligible children. Short-term measures that were put in place included increasing class size and double shifting to cope with the growing need for basic education.

Between 1970 and 1995, the average years of schooling almost doubled from 5.74 years to 10.25 years and access to secondary education was almost universal. Korea's achievement in expansion of secondary education is attributed to the following:

First, education was recognized as a major part of the development strategy. Education played a central role in Korea's development strategy since 1950s, as reflected in policy and budget priorities. For instance, between 1954 and 1959, government spending on education tripled. Budget allocations increased steadily from 14.3 per cent of the total government budget in 1963 to 17.5 per cent in 2003. The education budget as a percentage of the GDP also increased from 2.9 per cent in 1970 to 3.6 per cent in 1999. For a sustainable change and reform in education, the political commitment at the inception of a national educational development plan is critical.

Second, education development was systematically built on prior achievements. Primary education was emphasized in the 1960s, while in 1970s policy and public funding emphasis shifted to secondary education and in the 1990s to tertiary education. Timing and sequencing of policy choices was very important in Korea as it helped push the education frontier from the lower to the upper part of the system.

Third, there was mobilization of resources from both public and private sources. The central government education is supported by the nation's tax. In 1971, the Korean government earmarked, through a Local Education Grant Act, a proportion of internal tax revenue for teachers' salaries and recurrent expenditures of primary and lower secondary education. It also re-introduced a special purpose tax, mainly collected as surtax from a number of national and local taxes, including property tax, special consumption tax, tobacco tax, alcohol tax and gasoline tax to cater for teachers. The special tax was used to finance the improvement of physical conditions of primary and secondary schools. As of the year 2000, these two sources of education funds accounted for about 78.5 per cent of the Ministry of Education's expenditures. Central government education budget is about 20 per cent of total budget. Of the 20 per cent, 83.1 per cent is transferred to the

metropolitan and provincial offices of education, while the remaining goes to the central Ministry of Education and Human Resources Development.

From the private sector, the government has offered financial incentives such as a public subsidy and tax exemption to promote their participation in education. This started in the 1970s when admission policy was reformed. The government at one time enacted a law exempting private schools from taxation in the acquisition and sale of properties and provided subsidies to cover the shortage of remuneration and operating costs. The amount of subsidy is determined by the difference between the school's budget and a standard budget for a public school of the same enrolment size. Thus, because of the subsidy and measures of equalization, there has not been any significant difference between private and public schools. However, although private schools get support from national and regional entities and resources from school foundations, they also get funding through tuition from parents.

Besides the private schools, urban areas middle and high schools charge tuition to supplement government funding, and funds from parents and regional entities.

Fourth, the Korean government has been keen to ensure equal opportunity for all because of the government's egalitarian ideals. In 1968, the secondary entrance exam was abolished and replaced by a lottery system based on residence, which virtually eliminated elite secondary schools. This system was well accepted by students, parents, and other stakeholders without much controversy. In 1974, a similar system was adopted for senior secondary schools.

Finally, at the early stages of expansion, South Korea combined a system of centralized financing with a system of autonomous local provision. Autonomy in the allocation and mobilization of resources made it easier for local education authorities to secure financial and personnel resources. Korea's educational institutions (elementary, middle and high schools) are controlled by the metropolitan and provincial offices of education.

Between the mid-1970s through the 1980s, major reforms were introduced in the education sector to ameliorate social ills associated with severe competition for college entrance. For instance, there were reforms that attempted to reduce private tutoring, which entailed an inordinate

financial burden to parents. In fact, entrance into elite schools became so intense that grade repetition and private tutoring soared and even became a social concern. This extreme competition was criticized on the basis that examination preparation would hamper the mental and physical development of a child, and that private tutoring would place excessive financial burdens on parents. The government responded by removing barriers of student flow and increased capacity at secondary school through public financing and privatization.

The literature on Korean education system warns that owing to what is referred to as idiosyncrasies of the Korean context, one must be careful not to draw direct implications from the experience of the Korean education.

2.6 Summary of Experiences⁸

Achieving universal primary education should be the first aim to progress into secondary education. The progress of providing universal primary education and improvement in learning achievement remains incomplete in Africa while in US, Europe and East Asia, large scale secondary education took place when universal completion of basic education had been achieved.

It appears that in most African countries, the selection process into secondary school is the first obstacle to enrolment in secondary education. In fact, the selection process has made secondary education to be exclusive instead of being inclusive. The developed countries realized this sooner than later and the results are tremendous.

Tuition and other formal and non-formal costs are often unaffordable. There is a high share of private funding by households whose costs includes: official government tuition, official government boarding fees, contribution to school management committees, contribution for the costs of textbooks, costs of learning materials, school supplies, private tuition, transportation and uniforms. Parental contributions have become an essential complement to public funding because of stagnation in government funding.

Budgetary constraints and inefficiencies in the deployment of resources have resulted in shortages in textbooks, instructional materials and supplies, and double or triple use of facilities. The main cost in secondary school is the cost of teachers; i.e. salaries are the largest component of the education budget. This has been crowding out allocations for other expenditures, resulting in severe shortages of textbooks and instructional materials, hence,

⁸ For a comprehensive analysis on issues discussed here, see SEIA (2007).

adversely affecting the effectiveness of instruction. The high salary costs per pupil are attributed to low rate of utilization of teachers, among other things.

Boarding schools also increase education costs and make secondary education a bit expensive. This implies that poor rural parents can ill afford. Because boarding facilities are expensive to build and operate, expansion of secondary education can largely be achieved through day schools. Ensuring opportunities for secondary education is available close to a student's home is an essential element of affordability and equitability. Such day secondary schools could be associated with nearby primary schools, possibly as rural schools as was done in Thailand and Zimbabwe immediately after independence. This model was in fact adopted in many industrialized countries in the twentieth century. Because of the cost of constructing schools, classrooms and other specialized facilities, double-shift use of facilities is often an attractive option for generating cost savings. This worked well in Korea, Singapore and even in some African countries.

The role of the private sector is also very important in expansion of secondary education. Several governments have attempted to establish partnerships with the private sector by providing financial support that allows students to enrol in private schools (demand-side financing). Other countries provide supply-side incentives. For instance, Burkina Faso offers private providers loans for construction of additional classrooms; Lesotho's government pays the salaries of teachers and in other countries such as Zimbabwe, the government provides grants-in-aid to private providers (especially to churches). In Malawi, the government provides matching grants for school development to communities. Mali also supports the private sector by financing about 80 per cent of the teachers' salaries in Catholic schools, while the Korea government provides subsidies to the private sector to promote its participation in secondary education.

It is evident that at the school level, private and public sources are already intertwined to support the delivery of education services. It is very clear that in most countries, governments will not be able to be the sole source of financing and provision of secondary education. Public expenditure in secondary education has been very inadequate.

2.6.1 Lessons Learnt

First, double shifts is a common feature especially in secondary education systems. These have succeeded more in developed countries and are only being experimented in Africa. However, it can be concluded that double shifts are more beneficial in terms of resource utilization and, therefore, cost-cutting. Second, in the countries reviewed, secondary education is part of

basic education, hence allowing it to enjoy public support accorded to basic education. Third, public-private partnerships exist in financing secondary education, with governments meeting teaching costs in private not-for-profit schools and sponsoring students to study in private schools. Finally, examinations and affordability seem to be the major determinants of transition to secondary education.

3. Analysis and Results

If there is a policy shift in financing⁹ secondary education in favour of heavy public subsidy (or what would popularly be called free secondary education), the enrolment dynamics of secondary education and the resource mix will change drastically and almost instantly, if the experience of Free Primary Education (FPE) is anything to go by.

In order to show a breakdown of the cost implications of Free Secondary Education (FSE), and informing the FSE debate, we assume five possible scenarios that differ in implementation approach, though using the same policy parameters. However, we recognize that they are not the only scenarios that could be simulated. The three scenarios include first, implementing a full FSE in all grades in the initial year; second, gradual roll out of FSE starting with F1 in the initial year then progressively including the other grades within a span of 4 years; and finally, providing teaching and learning materials (TLM) to all grades. A combination of the last two seems practical as well. However, their overlapping effects on enrolment makes it difficult to simulate the impact. In this study, therefore, we limit the simulations to individual approaches.

Before looking at what the simulations show, it would be important to understand some of the policy parameters and variables that are driving the simulations. Annex Table 1 presents a description of parameters, variables and some of the assumptions made. In the event that FSE is to be implemented now or in future, the two main implementation approaches identified above require different levels of inputs, produce different outputs and have different implications both within and outside education spheres.

3.1 Full Roll Out of Free Secondary Education

Implementing a full FSE would mean that infrastructure and other inputs have to be procured in the shortest time possible to avert an education quality crisis. In the meantime, what will happen to the students? Staying home to wait for school places to be expanded would be interpreted to mean that the policy has failed. The alternative would be a crash programme to try and absorb the extra numbers within the existing infrastructure and perhaps hope that the expected drop in quality of education will be short-lived. Teachers and school managers would have to deal with overcrowded classrooms and hostels. The question that arises here is whether key

⁹ See also Onsomu *et al.* (2006a).

stakeholders (teachers, school principals, BoGs and PTA) would co-operate. The other alternatives to solve the infrastructural problem in the short-term (quick fix) would be to:

- (i) Utilize any idle capacity in other neighbouring government institutions, including teacher training colleges, Youth Polytechnics (YPs), and technical institutions, among others;
- (ii) Call upon the private sector and other religious organizations to make available, on short term basis, any of their underutilized or idle infrastructure that meets certain minimum conditions for use by FSE but would they be willing and at what cost?;
- (iii) Expand existing infrastructure in primary schools to accommodate a day secondary school—a most possible alternative;
- (iv) Encourage students and able parents to go for admission to private schools then give them vouchers equivalent to the unit allocation in public schools; and
- (v) Introduce double shifts using the existing infrastructure, especially in densely populated areas. Though it is notable that double shift do not necessarily improve transition or enrolment, they increase utilization of resources and hence cut costs. In some countries where they are practiced, they are unpopular with parents but liked by teachers as they teach half day, that means a shorter working day.

The second main resource issue that comes with this option is teacher requirement. Currently, the government is very much aware of the extent of teacher shortages, though there is unequal distribution leading to overstaffing in a few schools and subjects while creating severe shortages in others, especially in core subjects. One cannot, therefore, expect the existing manpower to meet the demand for teaching services under this scenario.

Preliminary analysis shows that to maintain quality while at the same time improve on teacher utilization with a view to keeping teacher wage bill within manageable levels, about 11,590 teachers (5,403 in 2008 and 6,187 in 2009) would be needed in the short-term to cater for the extra students, at an Average Teaching Load (ATL) of 18 hours per week. If lower Pupil-Teacher Ratio (PTR) and ATL were to be preferred, then a higher number of teachers than proposed would be required. It should be noted that in 2005, PTR was about 21 and the Economic Recovery Strategy recommends a PTR of about 35 for effective utilization of teachers. The number of additional teachers required could be lower with increased utilization of the existing manpower while reducing the pressure. Another issue to contend with is whether the labour market can supply this number of secondary school

Table 5: A summary of resource requirements and costs of a full FSE

Item	2007	2008	2009	2010	2011
Standard 8 enrolment	723,773	808,845	783,495	911,750	912,236
Secondary school enrolment	1,009,645	1,387,758	1,811,827	2,247,584	2,749,419
Additional number of classrooms and other infrastructural needs		427	8,686	10,292	10,554
Additional number of teachers		5,403	6,187	19,238	19,862
Additional number of computers		139,639	35,178	40,572	
COSTS		2007/08	2008/09	2009/10	2010/11
Cost of TLM (Ksh million)		6,339	5,922	5,308	5,555
Cost of additional classrooms & other infrastructure, incl. repairs (Ksh million)		171	4,377	5,228	5,435
Teacher wage bill (Ksh million)		25,284	28,030	35,660	47,358
Total cost (less computers) (Ksh million)		39,766	48,457	58,700	73,918
Student per capita grant (FSE)—no computers		7,531	5,778	4,691	4,373
Possible financing gap (no comps.) (Ksh mn.)		14,093	21,624	30,836	45,033
Total cost (with computers) (Ksh million)		39,776	55,439	63,071	75,811
Student per capita grant (FSE) —with computers		7,531	9,945	6,775	5,105
Possible financing gap with computers (Ksh million)		14,093	28,606	35,207	46,927

Source: Generated by the Education Simulation Model 2007 version

trained teachers. Fortunately for Kenya, the training markets continued operating as usual even with a freeze on teacher recruitment that came into effect in 1997/98. Therefore, the labour markets can supply. The critical issue surrounding this resource is financing the extra teacher wage bill and whether such teachers are prepared to teach. At an average gross salary of Ksh 38,568 per month or Ksh 462,818 per annum, the secondary school teacher wage bill would increase by over Ksh 2.2 billion in the first year.

The third main provision under this scenario will be provision of text books to all students (F1 to F4). Again, to safe guard against quality decline, given the inevitable overcrowding, it would be necessary to supply text books at a ratio of 1:1. This is very rational given that the policy on pupil-textbook ratio for upper primary is 2:1. If this is done for seven subjects, at an average of Ksh 300 per text book for an expected total enrolment of 1.3 million in the initial year, the textbook bill (together with other TLM) is estimated at Ksh 6.3 billion in the first year of implementation. However, it is possible to reduce this amount if a decision is made to supply textbooks to only a limited number of the existing secondary school students, as some of them already have the books. This cost covers textbooks, teacher guides and costs of other teaching and learning materials, among others.

The fourth main cost consideration would be student accommodation (including meals) bill for existing boarding schools. In 2003, boarding

schools had 52 per cent of the secondary school population (Onsomu, *et al.*, 2006a). Assuming this trend is maintained, then we budget for about 60 per cent in the initial year of the expected 1.3 million. About 758,000 pupils will be provided with accommodation at an average cost of Ksh 6,333 (MoE guideline) per year. The expected accommodation bill will be Ksh 4.8 billion. It is expected that households would meet the cost of transport, clothing, including school uniforms if applicable and personal effects.

Finally, to provide FSE, the government would have to slightly increase programme administrative costs. This involves the current non-salary expenditures in secondary schools that stood at Ksh 210 million in 2005/06 financial year. This cost would be covered under operations and maintenance, which is calculated at 10 per cent of total cost less boarding expenses. The total operations and maintenance cost for a full FSE is estimated at Ksh 3.2 billion in the initial year and Ksh 5.8 billion in the fourth year. Schools would benefit from this allocation to meet their general purposes expenses, while the District Education Office and the Quality Assurance Office would use the same funds to monitor implementation of FSE.

Before implementing FSE, a number of other critical policy decisions have to be made. For instance, do all students have to follow the same general education curriculum or should there be a parallel and flexible secondary vocational and technical curriculum? The outcome of such a policy decision is expected to influence the costs of implementing FSE. Assuming 15 per cent of Std 8 leavers likely not to attend formal secondary schools, for whatever reason, are facilitated to enrol in Youth Polytechnics (YPs), about 145,592 pupils will be expected to enrol in YPs. It is, however, important that if FSE is implemented, the programme should benefit YPs in order to finance artisan training programmes and ensure improved skills training, otherwise Std 8 completers would shun them in favour of FSE. This would announce a death knell for YPs and perhaps kill the spirit of skill development among the youth, especially in rural areas. Some other reforms that would be considered include: rethinking the role of examination in Free Secondary Education (FSE). The role of Kenya Certificate of Primary Examination in relation to secondary education may have to be revisited with greater focus on learning achievements and competence levels rather than for selection purposes.

It would also be of policy importance to discuss who should actually be subsidized. Does the public need to provide FSE, using scarce resources, to households than can actually afford to pay? This calls for an elaborate targeting and funds disbursement mechanism. In addition, the role of the private sector investment in free secondary education provision needs to be understood. It is not the intention of the government to push the private

sector out of secondary education financing and provision. Overall, FSE should give cognisance to the need to improve quality and linkages between secondary education and labour market and not only expanding access to secondary education.

3.1.1 Macroeconomic implications of a full FSE

The following analysis looks at the macroeconomic implications of meeting the FSE financing gap. The amount of the gap is considered as injected in the economy through government expenditures and thus implication tracked through increase in total expenditures by the gap amount. The KIPPRA-Treasury Macro Model (KTMM) has been utilized with a medium term period covering years 2008 to 2011. Table 6 presents the results after the overall secondary financing gap presented in Table 7 is financed by the economy in the option of full FSE with computer expenditure included.

The gap can be financed through a mixture of two sources—extra tax revenues generated in the economy and/or domestic borrowing through the Central Bank. From Table 6 it is quite evident that domestic borrowing is more than the extra tax revenues, though the difference between the two narrows with time. The macro implication of this scenario is as follows:

- The mixture of the two sources of financing (domestic borrowing and tax revenues) gives forth a positive impact on economic growth, where the highest extra growth is shown in year 2009 with growth level of 1.5 per cent. This implies that these expenditures are growth enhancing, as they are classified in both recurrent and development, thereby increasing economic growth significantly.

Table 6: Effects of implementing a full FSE

Variable	2008	2009	2010	2011
Real GDP	1.0	1.5	1.1	0.9
Inflation	-0.01	-0.04	0.06	0.30
Exchange rate	0.00	-0.01	-0.02	-0.02
Current account	-0.2	-0.6	-0.9	-1.1
Budget deficit	-0.6	-0.9	-0.9	-1.1
Public expenditure as % GDP	0.4	0.6	0.6	0.6
Private consumption	0.93	1.45	1.17	0.95
Private investments	0.07	3.01	3.04	1.42
GAP—Expenditures on Education	14,093	28,606	35,207	46,927
Domestic borrowing	12,443	22,443	24,742	33,029
Extra total revenues	2,410	7,676	13,502	19,297
Total expenditure and net lending	14,856	30,106	38,202	52,261

Source: Generated by KTMM, 2007

- The budget deficit in this scenario worsens. As expenditures and revenues are both above the line budget items, the fact that expenditures increase more than the extra revenues generated means that the budget deficit is doomed to worsen all through as there is no equivalent counter balancing amount to the increased expenditures. This calls for massive financing levels through domestic sources, which may lead to the crowding out effect on private investments.
- The financing of the gap leads to an overall increase in inflation in the economy. Though in the first two years inflation improves marginally, as the amount of expenditures are less compared to ensuing years, the last two years record an increase in inflation levels. The increase in inflation levels is caused by massive public expenditures that trigger an increase in private consumption thereby pushing the general prices upwards.
- The total public expenditure as a percentage of GDP also increases as free secondary education requires extra expenditures to the tune of Ksh 14.1 billion in 2008 to Ksh 46.9 billion in 2011, which are huge amounts compared to the current secondary education public expenditures.
- The private consumption records some improvement throughout the period, which is necessitated by the high levels of government consumption. Also, the increase in private consumption can be alluded to freed resources in the households, which would have otherwise been spent on payment of school fees.
- There is a significant improvement in private investments, which basically is due to improved economic growth. Also, the increase in government investments helps a lot in increasing private investments. The improvement in private investments is on a rising trend in the first three years while the growth slows in the fourth year which is due to the crowding out effects of domestic borrowing.
- This mode of financing FSE has two adverse effects, namely: the worsening of budget deficits, which eventually crowds out private investments; and worsening of inflation levels in the economy.

Another implication of FSE (though not easily quantifiable) is the impact it will have on the informal book industry. In urban centres, a number of MSE rely on selling secondary school textbooks to prospective students. In the event that the cost of TLM will be met by the government, then the money meant for this item will most likely be sent to schools. Based on the Ministry of Education guidelines, suppliers of such school items are registered businesses, including formal MSEs. Introduction of subsidized secondary education, which will call for provision of TLM will, therefore, be expected

to have a negative implication on informal MSEs, and especially those in book selling. This is likely to be in form of lost sales, leading to diminishing returns that may eventually require the affected MSE's to change their business.

3.2 Roll out Gradual Free Secondary Education

Table 8 and Annex Table 3 present the simulation outputs for the second scenario, that is, implementing a FSE gradually starting with F1 in the initial year, say in 2008. Rolling out FSE in say over a four year period—that is gradual—would put less pressure on resources and allow for a more elaborate

Table 7: Financing gap for secondary education for implementation of a full FSE

	No Computers				With Computers			
	2007/08	2008/09	2009/10	2010/11	2007/08	2008/09	2009/10	2010/11
Recurrent gap	14,093	17,547	25,909	39,897	14,093	24,529	30,280	41,791
Dev. Gap	-129	4,077	4,927	5,136	-129	4,077	4,927	5,136
Overall Fin. Gap	14,093	21,624	30,836	45,033	14,093	28,606	35,207	46,927

Table 8: A summary of resource requirements and costs of gradual implementation of an FSE

Item	2007	2008	2009	2010	2011
Standard 8 enrolment	723,773	808,845	783,495	911,750	912,236
Secondary school enrolment	1,009,645	1,387,758	1,811,827	2,247,584	2,749,419
Additional number of classrooms and other infrastructural needs		427	9,135	10,924	11,392
Additional number of teachers		5,403	6,187	19,238	19,862
Additional number of computers			139,639	35,178	40,572
Costs (Ksh Million)		2007/08	2008/09	2009/10	2010/2011
Cost of TLM		3,296	4,173	5,160	5,912
Cost of Additional Classrooms and other infrastructural needs including repairs		171	4,377	5,228	5,435
Teacher wage bill		25,284	28,030	35,660	47,358
Total cost (less computers)		33,830	44,830	57,624	74,310
Student per capita grant (FSE)—no computers		4,883	4,630	4,614	4,525
Possible financing gap—no computers		8,147	17,997	29,760	45,426
Total cost (with computers)		33,830	51,812	61,995	76,204
Student per capita grant (FSE)—with computers		4,883	8,797	6,697	5,257
Possible financing gap with computers		8,147	24,979	34,131	47,319

implementation plan to be put in place. The main determining grade of FSE resource requirements and subsequent costs is F1 as enrolment in this grade would constitute about 46 per cent regardless of whether it is full or gradual FSE. Since the main reason for going for gradual implementation of FSE is to reduce the expected pressure on resources, we concentrate more on the difference in resources and cost requirements of full implementation of FSE and gradual implementation.

In fact, implementation of a heavily public subsidized secondary education can be made more feasible if the government were to concentrate more on FSE in day schools, with students joining non-day and private schools being allocated vouchers equivalent to the cost of a day school. This would perhaps call for bursary support to disadvantaged households to educate their children in non-day schools.

The two approaches have the same impact on transition, enrolment, number of teachers, infrastructural needs and computers as all these depend on the new F1 entrants. However, resource requirements in terms of TLM and boarding expenses will be the main source of cost variations as shown in Table 9. Gradual FSE implementation is relatively cheaper in the short run by about Ksh 5.6 billion but the two approaches would have little difference by the fourth year of implementation. From this analysis, it would seem that gradual FSE is more attractive on cost considerations. However, this does not rule out any other implementation approach.

Table 9: Non-operations and maintenance Cost difference between full and gradual FSE (Ksh million)

ITEM		2007/08	2008/09	2009/10	2010/11
Teaching and learning materials	Full	6,339	5,922	5,308	5,555
	Gradual	3,296	4,173	5,160	5,912
Boarding expenses	Full	4,803	6,367	7,971	9,821
	Gradual	2,204	4,663	7,058	9,821
Total	Full	11,142	12,289	13,279	15,376
	Gradual	5,500	8,836	12,218	15,733
Difference		5,642	3,453	1,061	-357

Table 10: Effects of implementing a gradual FSE

Variable	2008	2009	2010	2011
Real GDP	0.6	1.4	1.2	1.1
Inflation	-0.01	-0.04	0.01	0.21
Exchange rate	0.00	0.00	-0.02	-0.02
Current account	-0.1	-0.5	-0.8	-1.1
Budget deficit	-0.3	-0.8	-0.9	-1.2
Public expenditure as % GDP	0.3	0.6	0.6	0.7
Private consumption	0.53	1.35	1.28	1.17
Private investments	0.04	1.94	3.22	1.92
GAP - Expenditures on education	8,147	24,979	34,131	47,319
Domestic borrowing	7,122	20,308	24,901	33,905
Extra total revenues	1,379	5,828	11,816	18,243
Total expenditure and net lending	8,503	26,132	36,685	52,089

Source: Generated through KIPPRA-Treasury Macro Model

3.2.1 Macroeconomic implications of a gradual FSE

This analysis gives the macroeconomic implication when a gradual process of FSE is implemented using domestic resources. The cost implication ranges from Ksh 8.1 billion in year 2008 to Ksh 47.3 billion in year 2011. Table 10 shows the results of the macroeconomic implication if the option is a gradual FSE when computer expenditures are included.

In the financing gap (Table 11), the recurrent expenditures are different from the other scenarios and range from Ksh 8.1 billion in 2008 to Ksh 42.1 billion in 2011. This gap is intended to be financed from the extra tax revenues generated in the economy and domestic borrowing. Though it is a mixture of two sources, domestic borrowing is more than the extra tax revenues. The macro implications are:

- There is an improvement in the economy as it registers 0.6 per cent in 2008 to 1.1 per cent in 2011. The highest growth is recorded in year 2009 with a rate of 1.4 per cent. The expenditures in this case were in public consumption and also public investments, which boost growth in the economy quite well. Thus, these expenditures are growth-enhancing.
- This scenario registers a worsening budget deficit. The expenditures are quite high and also more than the revenues generated. Further, domestic borrowing requires payment of interest on loans, which increases the already high expenditures. This causes the budget deficit to worsen all through the entire period, which is likely to lead to crowding out effect on private investments.

Table 11: Financing gap for secondary education for a gradual implementation of FPE

	No Computers				With computers			
	2007/08	2008/09	2009/10	2010/11	2007/08	2008/09	2009/10	2010/11
Recurrent Gap	8,147	13,920	24,833	40,290	8,147	20,902	29,204	42,183
Development Gap	-129	4,077	4,927	5,136	-129	4,077	4,927	5,136
Overall Sec Fin Gap	8,147	17,997	29,760	45,426	8,147	24,979	34,131	47,319

- Financing of the gap leads to an overall increase in inflation in the economy. Though in the first two years inflation improves marginally as the amount of expenditures are less compared to ensuing years, the last two years record an increase in inflation levels. The increase in inflation levels are caused by massive public expenditures, which trigger an increase in private consumption thereby pushing the general prices upwards.
- The total public expenditures as a per cent of GDP have also gone up. The increase ranges from 0.3 per cent of GDP in 2008 to 0.7 per cent of GDP in 2011. These are high levels of expenditures compared to the current budget as they claim expenditures as high as Ksh 47.3 billion in year 2011.
- Due to the high levels of government consumption expenditures, private consumption responds by going up rapidly throughout the period. The increase in private consumption has been triggered by the freed resources in the households that would have otherwise been spent on payment of school fees. The highest recorded increase is in year 2009 with a level of 1.35 per cent.
- There is significant improvement in private investments which basically is due to improved economic growth. Also, increase in government investments helps a lot in increasing private investments which is on a rising trend in the first three years. However, the growth slowed in the fourth year, which basically is due to the crowding out effects of domestic borrowing.
- This mode of financing the FSE has two adverse effects, namely, the worsening of budget deficits, which eventually crowds out private investments, and the worsening of inflation levels in the economy.

The two scenarios are not very different as the financing gap for the two options are almost the same save for 2008. The minor differences are absorbed in the model multiplier analysis, thus giving the same results. The development expenditure financing gap is the same for the two options.

3.2.2 Other Implications of a gradual implementation of FSE

Given that the two approaches are being driven by new entrants in F1, their implications to education are not expected to be very different. However, the gradual implementation is expected to face a number of student flows and discipline-related challenges that will require quick administrative decision interventions. To start with, there will be pressure from parents and students of forms two to four to include them in the FSE programme with their exclusion likely to be described as a propagation of inequality and/or discrimination by extreme socialists and advocacy groups. At this stage, it may not be clear how F1 beneficiaries are likely to be treated by the other students who are excluded from the programme. However, it may not be surprising if they meet some level of hostility, though this will vary from school to school.

The other discipline-related challenge revolves around the use of shared inputs such as maps and reference books that may cut across grades. In the event that this is not controlled, the lifespan and/or access to such inputs by the intended group will be compromised. Closely related to this is theft of TLM with day schools likely to be more affected than boarding schools where carrying out random searches may be easier. In a study on delivering quality and improving access of FPE in Kenya, it was reported that, on average, schools lost about 26 textbooks though in some instances more than 200 books were lost (Ministry of Education, 2006b). Compliance rate with the lost book replacement policy was at 58 per cent, thus leaving a considerable proportion of books un-replaced.

Currently, there is public concern on drug and substance use in secondary schools in Kenya. An influx of more students in this level does not help this situation either. In fact, an upsurge of over-age students and/or students who may re-enter after some withdrawal is a determining factor in indiscipline cases. Such students are likely to be more at risk of drug and substance use in school. In addition, there would be the challenges of classroom management and instructional methods when dealing with over-age students. However, administrative and pedagogical decisions are expected to intervene with in-servicing teachers likely to assist with coping mechanisms.

Finally, gradual implementation is likely to induce temporary school withdrawal of students who are experiencing financial challenges and are not targeted by the secondary school bursary. Such students may choose to delay their education on the grounds of inability to raise fees. Unless the school can prove that such students benefit from the bursary scheme, they will withdraw only to re-enter at a later date when their grade is covered by

FSE. Going by the number of students who are in need of financial assistance, as manifested by cumulated fees arrears of Ksh 10 billion, the number expected to take this action will be large. However, to control for this action, the Ministry of Education, through school administration and Constituency Bursary Committee (CBC) can target this group and perhaps use enhanced bursary funds to retain them in school.

3.3 Provide Teaching and Learning Materials and School Infrastructure

Table 12 and Annex Table 4 present the results of scenario three which involves public provision of Teaching and Learning Materials (TLM) and the necessary School Infrastructure (SI). This scenario gives an alternative for subsidizing the cost of secondary education under resource constraints. Unlike the other two scenarios, the TLM-SI scenario exempts the parents from paying for that part of tuition fee meant for TLM and SI expenses. Parents will still be expected to pay other non-TLM and SI fees such as boarding and transport-related expenses while the government will pay for TLM-SI or tuition fees (in addition to teacher salaries). This scenario, like the others, also assumes and/or expects heavy support from CDF to go to school infrastructural developments. Full/gradual FSE estimates real transition of 80 per cent in 2008 up from 40 per cent. On average, TLM, which is the main focus in this scenario, constitute about 60 per cent of

Table 12: A summary of resource requirements and costs under a TLM-SI implementation

TLM-SI Items	2007	2008	2009	2010	2011
Std 8 enrolment	723,773	808,845	783,495	911,750	912,236
Secondary school enrolment	1,009,645	1,271,954	1,594,440	1,935,257	2,327,772
Additional teachers		5,113	819	14,514	15,395
Additional classrooms		(486)	5,790	7,753	8,180
Additional computers			121,524	27,267	31,461
Costs (Ksh million)		2007/8	2008/9	2009/10	2010/11
Cost of TLM (Ksh million)		5,683	5,115	4,379	4,591
Teachers wage bill (including FTSE) in Ksh million		25,139	26,422	31,470	40,595
Cost of additional classrooms and other infrastructural needs including repairs (Ksh million)		171	2,496	3,331	3,564
Total costs [ATL 18& FTEP, class depreciation, additional class construction, and TLM & OM]		34,091	37,435	43,098	53,625
Estimated sec. educ. financing gap, i.e. total cost less allocations (Ksh million) – no computers		8,407	10,602	15,234	24,741
Student per capita grant (FSE) - no computers		7,649	5,841	4,647	4,376
Grand total (with computers) Ksh million		34,091	43,511	46,818	55,093
Student per capita grant (FSE) - with computers		7,649	10,008	6,730	5,055
Estimated sec. educ financing gap if computers provided (Ksh million)		8,407	16,678	18,954	26,209

Table 13: Free secondary education— with computers and TLM-SI

Variable	2008	2009	2010	2011
Real GDP	0.6	0.9	0.6	0.5
Inflation	-0.01	-0.03	0.04	0.18
Exchange rate	0.00	0.00	-0.01	-0.01
Current account	-0.1	-0.4	-0.6	-0.7
Budget deficit	-0.4	-0.6	-0.5	-0.7
Public expenditure as % GDP	0.3	0.4	0.3	0.4
Private consumption	0.55	0.88	0.64	0.57
Private investments	0.06	1.84	1.92	0.72
	Ksh million			
GAP—Expenditures on education	8,367	17,161	19,599	26,890
Domestic borrowing	7,378	13,480	13,389	18,939
Extra total revenues	1,434	4,617	7,928	11,259
Total expenditure and net lending	8,813	18,090	21,292	30,159

non-salary secondary education expenses (before introduction of computers). This translates to an increment of 24 percentage points of real transition from 40 per cent to 64 per cent. We, therefore, assume a real transition of 64 per cent in 2008, which will thereafter stabilize at 72 per cent (optimistic). If TLM-SI were to be implemented, it would constitute a heavy public subsidy to day secondary schools.

This approach has a relatively low impact on transition, enrolment, number of teachers, infrastructural needs and computers as all these depend on the new F1 entrants who are mainly attracted by lower fees, among other factors. The TLM-SI implementation is relatively cheaper compared to a full or gradual implementation of FSE. From this analysis, it would seem that a TLM-SI is relatively more practical on cost considerations. However, this does not rule out any other implementation approach.

3.3.1 Macroeconomic implications of provision of TLM-SI

This analysis gives the macro implication in the economy when free secondary education (in terms of teaching, learning materials and school infrastructure) is implemented using domestic resources. The cost implication ranges from Ksh 8.3 billion in 2008 to Ksh 26.9 billion in 2011. Table 13 shows the results of the implication in the economy when computer expenditures are included.

This gap on expenditures is intended to be financed from the extra tax revenues generated in the economy, and domestic borrowing. Though it is a

mixture of two sources, domestic borrowing is more than the extra tax revenue throughout the review period. The macro implication of this scenario is as follows:

- There is a slight general improvement in the economy as it registers a positive growth in terms of 0.6 per cent in 2008 to 0.5 per cent in 2011. The average growth for the entire period is 0.6 per cent, which depicts some level of stability in the economy.
- The budget deficit worsens, which is caused by a rise in expenditure as compared to the slow growth in revenues. Further, domestic borrowing requires payment of interest on loans, which increases the already high expenditures. This, therefore, causes the budget deficit to worsen all through the entire period.
- Inflation improves in the first two years as the amount of expenditure is less compared to ensuing years, while it worsens slightly in the last two years. The rise in inflation level is caused by high public expenditure, which triggers an increase in private consumption, thereby pushing the general prices upwards.
- The total public expenditures as a percentage of GDP have also gone up. The increase ranges from 0.3 per cent of GDP in 2008 to 0.4 per cent of GDP in 2011. These are high levels of expenditure when compared to the current budget.
- Due to the high levels of government consumption expenditures, private consumption responds by going up rapidly throughout the period. The increase in private consumption is triggered by the freed resources in the households that would have otherwise been spent on payment of school fees.
- There is significant improvement in private investments, which basically is due to improved economic growth. Increase in government investments helps to increase private investments. The improvement in private investments is on a rising trend in the first three years. However, in the fourth year, the growth slows due to the crowding out effects of the domestic borrowing.
- This mode of financing free secondary education has two adverse effects, namely: the worsening of budget deficits which eventually crowds out private investments; and the worsening of inflation levels in the economy.

3.3.2 Implications of TLM-SI provision to education

Parents pay for TLM in terms of tuition fees while SI is seen in form of the various occasional and or regular levies meant for development and maintenance. If the costs were to be subsidized to this extent for public schools, it would make the cost of secondary education more affordable. Specifically, students attending day schools would be the main beneficiaries as the cost of day secondary education would reduce drastically. As is the case with all other scenarios, an influx of students to secondary schools, and mainly day schools, would be expected.

Any influx of students to secondary schools is expected to have an impact on the quality of education. It is hoped that the rate of provision of TLM and SI would be high enough to cope with the increasing number of students. To maintain quality in schools, policy decisions on textbook teacher ratios, PTR, PCR and class size have to be observed up front. Provision of TLM-SI has positive equity implications in the form of promoting equal opportunities to learning. This is so especially among children coming from disadvantaged backgrounds and or districts where parents who are poor have been unable to provide quality teaching and learning materials.

3.4 Financing Sources

The next major question is where will the government get money to finance the gap? Several possible FSE financing sources can be explored. The feasibility of some of the sources remains very remote. However, it would be advisable to explore each of them. It is also notable that FSE will not be the only public investment choice that is likely to make claim on public funds. Other alternative public expenditure areas (social protection, health, and internal security, among others) will have to be considered along with FSE.

a) Domestic funding

This is the most practical source of financing because, in the recent past, there has been a rise in the efficiency of tax administration and collection; and positive gains in economic performance with real GDP growth rate estimated at 5.8 per cent in 2005 with higher expectations in the future. Therefore, there is more optimism that tax revenue generation will go up if the current trends continue.

While the foregoing sounds encouraging, a closer look at a comparison between estimated increased total revenue and the financing gap reveals that implementing a full FSE is quite a sacrifice, with the FSE financing gap likely to consume about 28 per cent of the increased total GoK revenue in the initial year (Table 14). This will be expected to rise to about 50 per cent

Table 14: Financing gap as a proportion of projected growth in total government revenue

Item (Ksh Million) Secondary Education		2006/07	2007/08	2008/09	2009/10	2010/11
Financing gap–Full FSE	No computers	n.a	14,093	21,624	30,836	45,033
	With computers	n.a	14,093	28,606	35,207	46,927
Total GoK Revenue*		377,400	428,300	482,600	544,400	636,000
Increase in total GoK revenue		n.a	50,900	54,300	61,800	91,600
Proportion (%) of financing gap to increase in GoK revenue**	No computers	n.a	28 (16, 25)	40 (33, 31)	50 (48, 37)	49(50, 37)
	With computers	n.a	28 (16, 25)	53 (46, 42)	57 (55, 43)	51(52, 38)

** Figures in brackets indicate the proportion (%) for a gradual FSE and TLM-SI

*Source: Government of Kenya (2007)

of the increased revenue by the fourth year of implementation. If the implementation is done gradually, the proportion of the gap to increase in total revenue is relatively low (16%). Given these proportions, spending the increased revenue on FSE is likely to compromise investments in other areas of the economy. However, one may want to argue that this is a worthy goal and a future investment. Due to analytical limitations, the paper has not analyzed the effects FSE may have on other public investment choices.

There are many other sectors and public financial needs that compete for this extra revenue generated. Given the priority and civic anxiety that would come with FSE, and coupled with the need to succeed, it would be expected that FSE will be a core programme whose expenditures require to be ring-fenced. The actual amount that can come from increased revenue will be a subject of discussion between Ministry of Education and Treasury. It is also likely that the final decision to implement FSE will have a strong political influence. However, results from KTMM show that this source can contribute between Ksh 2.4 billion and Ksh 19.2 billion in a four year implementation period.

b) Domestic borrowing

One of the economic implications of increasing domestic borrowing is the crowding out effect of private investment. However, the GoK is committed to maintaining low domestic borrowing requirements in order to provide adequate room for significant but non-inflationary expansion of credit to the private sector (Government of Kenya, 2007). If the government were to maintain this trend, then little is expected from this source. However, if it were to be used without necessarily expanding it, then it would compromise funding on other development expenditure items. Table 15 shows the proportion of the FSE financing gap to net domestic borrowing. This source is also tricky as the current government budget does not factor in donor money, thus it is a main source of financing the budget deficit.

Table 15: Financing gap as a proportion of projected net domestic borrowing

Item (Ksh Million)		2007/08	2008/09	2009/10	2010/11
Net domestic borrowing*		31,900	31,700	33,600	58,000
Proportion (%) of financing gap to net domestic borrowing***	No computers-				
	Full FSE	44 (26, 40)	68 (57, 52)	92 (89, 67)	78 (78, 58)
	With computers -				
	Full FSE	44 (26, 40)	90 (79, 72)	105 (102,79)	81 (82, 61)

*Source: BOPA 2007 for FY 2007/08 – 2009/10; Ministry of Finance for 2010/11

** Figures in brackets indicate the proportion (percent) for a gradual FSE

From Table 15, the proportion of FSE financing gap to projected net domestic borrowing for a full FSE range from 44 per cent in the initial year to 105 per cent in the third year. From the second year of implementation, proportions are quite high and it would seem unlikely that the projected net domestic borrowing would be directed to funding this gap. For a gradual implementation, the proportions are relatively low (26%) in the initial year only to rise sharply (102%) by the third year, with those of TLM-SI being much lower, i.e. 26 per cent and 79 per cent, respectively. The sharp rise in the proportions is because domestic borrowing is not necessarily incremental while the FSE financing gap increases progressively. All the same, results from EdSim and KTMM show that between 39 per cent and 59 per cent of domestic borrowing is likely to be channelled to FSE over a four year implementation period.

c) Official Development Assistance (ODA) in form of grants

Kenya's development partners have played a recognizable role in funding the FPE programme and, therefore, remain potential sources of financing FSE. International community interventions in education can be explained and justified in four ways.

- (i) The international community has committed itself to increasing ODA to developing countries equivalent of 0.7 per cent of their GNI by 2015 (KIPPRA, 2007). This is in line with the spirit of Monterrey Consensus on aids effectiveness.
- (ii) The international community has agreed on the MDGs that provide monitorable progress towards poverty reduction and intends to achieve universal primary education (Goal 2), gender equality and women empowerment (Goal 3) by the year 2015 (Government of Kenya, 2005c). While each country makes its commitments to human development, development partners are obliged to assist in the spirit of global partnership.
- (iii) Education, and especially primary education, has relatively high social returns (Manda, *et al.*, 2002). This has influenced international community policy on funding the education sector and deciding which level of education to channel their resources.
- (iv) On a one to one basis, bilateral interests do influence some development countries to fund their education sector. Such bilateral agreements and relations can not be overruled in sourcing financial resources for FSE. However, the question remains as to how much can be raised from development partners, bearing in mind that their focus is more on FPE. A look at development partners' contribution to the Kenya Education Sector Support Programme (KESSP) gives an

indication of what would be expected. Based on previous donor commitments and indications, Treasury projects that Ksh 2.092 billion and Ksh 1.216 billion for the 2007/08 and 2008/09, respectively, will come from development partners (Ministry of Education, 2007b). This is about 1 per cent of the education budget. While every shilling counts, with this level of support and the importance attached to FPE by development partners, there is little hope that FSE can receive anything close to these figures. In addition, ODA sources cannot provide a sustainable source for funding a countr- grown FSE.

d) Constituency Development Fund (CDF)

Use of CDF to improve school infrastructure is not new in Kenya. Specifically about 3 per cent (up from the statutory requirement of 2.5%) of government ordinary revenue is earmarked for constituency development (Kimunya, 2006). In the 2006/07 financial year, the amount earmarked for CDF was Ksh 10 billion while the expected revenue collection was Ksh 375.4 billion (Kimunya, 2006; and Government of Kenya, 2007). The CDF Act allows up to 50 per cent of this fund to be spent for education purposes (Government of Kenya, 2003). Assuming that the Ministry of Education can convince Members of Parliament and Constituency Development Fund committees to spend up to three-quarters of the 50 per cent in support of FSE for the next four years as an affirmative action, about Ksh 3.75 billion can be made available annually from this source—that would largely go into infrastructural development. However, availability of CDF funds is largely influenced by political good will.

e) Parents and sponsors

FSE itself cannot constitute the total cost of education. There exists other out-of-school direct costs such as school uniform, boarding expenses, transport and personal effects. This part of expenditure could be left to the parents and/or sponsors of individual students. It is, therefore, important to note that parents and/or communities have a financial input to make in FSE. In addition, *harambee* and private sector contributions have been used in the past as a source of infrastructural development in many schools. This avenue can also be explored but in a controlled and purely voluntary basis (devoid of abuse). It is difficult to estimate the expected revenue from *harambees* at the moment as they sometimes depend on political leadership, while contributions from the private sector depend on their strategic plans and what they may consider as corporate social responsibility.

f) Redistribution of current education allocation

Another option is that additional resources for secondary education can be mobilized through re-distribution of current allocation between levels and

within the sub-sector. Currently, primary education sub-sector receives highest allocation of government education expenditure, estimated at 54 per cent in 2005/6 (Government of Kenya, 2007). Secondary education and university education sub-sectors received 22 per cent (of which 94 per cent is recurrent) and 13 per cent of total education budget, respectively during the same period. This is attributed to the FPE capitation grants for schools and primary education teachers' salaries. Since primary enrolments are expected to stabilize and increase at a decreasing rate towards 2010 when the first FPE cohort exits primary education cycle, some of the resources could be allocated to secondary education. This is after giving adequate consideration to sustainable provision of primary education inputs that have direct impact on quality of education. Besides, when most schools attain the targeted pupil textbook ratio (1:2 for upper primary and 1:3 for lower primary), capitation grants for textbooks could be allocation for only replacement of textbooks (life span of 4 years) and any additional enrolment, while some resources could be re-allocated to secondary education learning and teaching materials. Any re-allocation from primary school cycle is, therefore, not feasible in the near future, until such a time when a re-evaluation is done to review unit capitation allocation to schools, considering the stock of TLM already purchased by individual schools.

4. Conclusion and Recommendations

This paper has presented results of an Education Simulation Model and KTMM in an attempt to show how the future is likely to be in the event of an introduction of FSE. These results have been combined with available literature on secondary education to form an objective discussion on possible implications of FSE and arrive at an informed conclusion and recommendations.

4.1 Conclusion

The paper concludes that despite several challenges, FSE would be a good public initiative which, if implemented, would increase access to secondary education while reducing the cost burden on parents and, therefore, allowing households to increase their consumption on other needs such as health and post-secondary education and training. This would impact positively on poverty reduction as it would increase the country's stock of human capital while at the same time increasing the social benefits of education. Such a move would be very popular with citizens, hence reinforcing the need for embarking on affordable or free secondary education; in fact, public satisfaction index with Government of Kenya performance would be enhanced.

Enrolment levels in secondary education are relatively low and require a major boost while, at the same time, most parents are unable to meet the increasing cost of secondary education. One of the available interventions, the bursary scheme, effectively uses conventional targeting approaches to distribute funds across constituencies. However, its inefficiency emanates from low levels of transparency in the implementation stage by some of the Constituency Bursary Committees (CBCs). It is, therefore, arguable that the problems bedeviling the bursary scheme are not targeting problems but merely operationalization problems, which are further complicated by stiff competition for inadequate funds, lobbying, political patronage and some degree of elite capture.

The FSE or heavily subsidized secondary education would lead to more youth enrolling in school, hence improving, in general, human capital and health standards among the wider population and reducing crime rate. This is largely because the youth, mostly associated with crime, will not only have been occupied in schooling but their level of understanding and human capital will have been improved in a way that they can appreciate relatively more constructive behaviour. Any constructive social-economic and political activity that keeps the youth engaged is likely to have a positive impact on

security. As an area for further research, the impacts of inter-sectoral shifts in public expenditure need to be understood.

Unfortunately, there is no single provision of a public service without a cost. The main costs will be associated with the alternative investments choices foregone and the fact that a heavily subsidized education will be competing for the same resources with other expenditure items within the education sector, such as teacher salaries. Introduction of FSE will compete for resources with FPE which has not yet gone through a full cycle (8 years) in addition to compromising the development of the TIVET sub-system, which is currently in dire need of revitalization. Outside the education sector, other areas of expenditure deemed to have greater impact on poverty reduction will have to wait. Such areas include expenditures on youth employment-related activities and social protection programmes.

Increasing government consumption to the magnitude of closing the FSE financing gap will not slow down growth though this will have inflationary effects especially in later years of FSE implementation. The major concerns in financing FSE include the implications on the quality of education and inter-sectoral resource competition. It would appear, therefore, that policy makers will have to make a decision between implementing FSE in the short term and, therefore, increase inter-sectoral resource competition, choose to meet part of the costs of inputs or delay the introduction of FSE to a later date with a view to increasing its capacity to roll-out a programme that will adequately address both quality and access of FSE that can produce the desired outcome. In doing so, the lessons learnt from FPE are very useful. Specifically, any subsidy will lead to an immediate influx of students to secondary school in a way that is likely to overstretch the existing school infrastructure. Such influx has to be dealt with administratively in the short term in order to allow expansion of school infrastructure in a way that quality will not be compromised. Adherence to strict policy guidelines in order to maintain the standards and reputation of the secondary school system regardless of which scenario of subsidized secondary education is adopted is a prerequisite of subsidizing secondary education. In the medium term, such policy guidelines include a mean PTR of 35,¹⁰ a class size of not more than 40, a textbook pupil ratio of 1:1, and an average teaching work load of 18 hours, among others.

¹⁰ ASAL areas could be allowed to operate with lower levels of PTR while high potential areas could be allowed to operate with a slightly higher PTR.

4.2 Recommendations

From the foregoing discussions, several recommendations can be made as a way forward on the issue of introducing FSE and or a heavily subsidized secondary education system.

a) *Managing the expansion of public expenditure on secondary education*

With or without FSE, the effectiveness of public expenditure on secondary education should be rationally managed with a view to making savings that could be ploughed back to improve both access and quality of secondary education. This can be achieved by controlling the growth of teacher wage bill, among other ways. Controlling teacher wage bill without affecting teacher salary levels is very practical. For instance, increasing teacher utilization through policy decision to increase Average Teaching Load (ATL) gradually from under 18 hours per week to 20 or above as recommended in the staffing norms report and other policy documents, will reduce teacher demand (KIPPRA, 2006b; Onsomu, *et al.*, 2006 and 200b). This should include re-distribution of teachers from overstaffed areas to understaffed areas bearing in mind social and structural bottlenecks. These actions should be done gradually in order to minimize shocks and also allow an assessment of the implications of stepping up ATL on the quality of teaching and learning. Wider consultations with main stakeholders should be made a continuous process for such reforms to be acceptable especially within trade union circles.

b) *Establish the unit cost of secondary education*

Currently, most public schools are charging between Ksh 18,000 and Ksh 50,000 per year, which compares relatively well with the 2001 Ministry of Education fees guidelines if one were to factor in inflationary changes. The basis of fees guidelines and school fees levels set by individual schools are not yet clear. It is, therefore, imperative to establish the actual unit cost of secondary education with a view to establishing the cost of providing secondary education either by the public or households. A survey on the market price of school inputs that are required to produce the desired outputs is one way of providing information for unit cost analysis.

c) *Provide teaching and learning materials and computers*

To balance between the many competing needs on public expenditure and in the spirit of partnership, cost sharing and making secondary education affordable to households (with or without FSE), the Ministry should consider providing all key teaching and learning materials including computers to public schools and especially day schools. While TLM may be required

immediately, the provision of computers could be delayed to up to one year from the time TLM are provided. The need for computers is justified by the current national and global technological changes. An environmental impact assessment exercise should precede the supply of large numbers of computers in order to establish social, economic, legal and environmental implications. Staggering the provision will allow a smooth roll out of school inputs. Day schools are preferred due to their low running costs, accessibility to households and thus providing better prospects for expanding secondary education in future.

d) Provide incentives to school managers for achieving expected results at low costs

In a social organization such as a school, the school manager is expected to act in the best interest of the organization and, therefore, compromise individual interests. More often than not, organizational interests conflict with individual interests. To ensure that the school manager will, in most cases, act in the best interest of the organization, it is imperative to introduce a system of reward (and punishment) for achieving the desired results at low costs. This is intended to induce the school management to act in the best interest of the school and the larger public. Such incentives should include tying this kind of indicator (desired results at lowest cost) to promotion (or demotion), non-salary monetary benefits and sponsored education trips, among others. Desired results or outputs should be agreed upon by stakeholders, mainly the school manager, Board of Governors, Parents Teachers Association, and the Ministry of Education.

Further, objective monitorable school level indicators should be included in the head teachers' performance contracts as a basis of assessing their performance, improving efficiency in resource utilization and school management. These include: average teaching load, pupil teacher ratio and class size achieved on annual basis. School revenue and expenditure records should be regularly monitored (by school audit unit) to enhance accountability and ensure all school revenues are efficiently utilized in provision of expected school inputs.

e) Enhance bursary funds and give full support of 4 years to all orphaned and vulnerable children

In the event that FSE is not practical in the short term, the Ministry of Education may have to consider enhancing bursary funds and combine this with more effective targeting approaches with a view to including all eligible orphaned and vulnerable children (OVCs). Benefiting students should be supported for the entire duration of their secondary education not unless it is established that the status has changed. Currently, targeting and awards

are inefficient and they could benefit a lot from making the process more participatory and de-linked from local politicians. The local politicians should actually play the role of the watchdogs rather than implementers by proxy. Targeting exercises need to be operationalized at the lowest administrative level such as sub-location/village level and use community local leaders, primary school headteachers and representatives of school management committees in order to be more effective in identifying the students who are vulnerable and/or poor. In addition, participatory monitoring of targeting processes need to be reinforced, with the citizens being encouraged to hold the duty bearers accountable. Other strategies for enhancing bursary could be initiated through self-targeting programmes such as bursary-for-work, which would allow parents to participate in LATF, CDF and Roads 2000 sponsored projects among other public works system projects.

f) Shift the selection of form 1 bursary beneficiaries to when they are in standard 8

In addition to the bursary improvement measures mentioned above, there is need to increase the real transition rate from under 40 per cent to over 60 per cent. Two ways of doing this include: (i) Target Form 1 beneficiaries when they are still in Standard 8, with a view to capturing those who are discouraged from reporting to the admitted secondary school due to lack of fees or information asymmetry. Community leaders, local church leaders, school management committee, zonal education officers, and primary school head teachers, among others should be involved in the selection, ranking or vetting of needy pupils using a standardized criteria. It is such ranking that should be forwarded to the awarding committee for the bursary award on condition that such a pupil has secured a place in a secondary school in the following year. Given that the difference between real transition rate (below 40%) and nominal transition rate (at 60%) is quite large, there is need to earmark a certain proportion of bursary for improving real transition rate. Such a proportion should only be spent on F1 who will be identified while in Standard 8. The exact proportion should be arrived at after considering the number of needy cases in the other classes (Form 2 to 4) so as to maintain retention.

g) Areas for further research

One of the areas that requires further analysis is showing the implications of the extra expenditures being spent in an alternative expenditure choice such as internal security, social protection or even creation of youth employment. Future work will require this to be done, with a model that can carry out inter-sectoral analysis in order to show the real cost or the opportunity cost.

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Annexes

Annex 1: Policy parameters and variables for simulation

Parameters/Variables and their Description/assumptions

What is driving the enrolments?

14-17 population growth rate: This is the secondary school age population. This population was assumed to increase at between 1.15 per cent and 1.35 per cent based on CBS 2002 estimates.

Transition rate (real versus nominal): In the past, real transition rate from primary school to secondary school has remained low—below 40 per cent. However, the nominal transition rate is relatively high (61%) and on the increase. In the event of introduction of FSE, the two are assumed to be almost the same and above 80 per cent. Nominal transition is the proportion of those selected for admission to Form 1 from Standard 8 enrolment (the group from which they came from). Real transition is the proportion of those enrolled in Form 1 from Standard 8 enrolment.

Dropout rate/repeater rate: These student flow rates (%) influence enrolment and progression. The two were projected based on the actual rates observed in 2003 school survey. The projected rates varied from grade to grade but in the range of 5.4-0.7 for dropout and 5.0 -0.3 for repetition.

Late entry and re-entry: In the event of FSE, students who sat for their KCPE in the past years but could not enrol to secondary school due to fees related reasons are likely to take this opportunity to enrol. Equally, those who dropped out are also likely to re-enter. One would expect an influx of over-age students, including young and elderly parents. However, it was difficult to anticipate the number of former students who are likely to do this. We, therefore, assume that administrative decisions will be used to control such influx.

What is driving teacher numbers and Salaries?

Enrolments: This was projected based on the corresponding school age population and transition rates from primary to secondary.

Average Teaching Load (ATL): Based on the previous KIPPRA analysis on related topics, staffing norms, recommendation and the need to increase teacher utilization, an ATL of 18 hours per week was found most appropriate for this analysis. Of course other ATL levels will give different outputs.

Full Time Equivalent Provision (FTEP): FTEP provision was to cater for teachers who are assigned administrative duties and, therefore, their ATL is likely to be lower than 18 hours. Time taken on non-teaching duties mainly vary by school size. Such teachers include the principal, deputy principal, and heads of departments, among others. This provision was made at 210 per cent of the number of public secondary schools. The 210 per cent was arrived at after considering the number of such teachers and their expected workload across school sizes varying from one stream to over 4 streams.

Average teacher salary: This is a mean value that was arrived at after considering the number of teachers in the payroll by job group and salary scale. If the recent teacher salary increments are effected, then this average will go up by an equivalent amount.

What is driving infrastructural inputs?

Pupil Classroom Ratio (PCR) – average class-size: PCR is computed by dividing the number of permanent classrooms by enrolment. The Ministry of education uses a norm of 40 for secondary school level. This PCR was used as an input into the number of classrooms needed.

Classroom depreciation rate: This was assumed at 2 per cent, adopted from KESSP infrastructural programme. This rate was used to identify the number of classrooms to replace because of depreciation.

Unit cost of 1 classroom: The unit cost was assumed at Ksh 400,000. This was adopted from KESSP infrastructural programme that uses Ksh 300,000 for a furnished primary school classroom, then inflated upwards to cater for inflation and expected furniture's for a secondary school classroom.

Unit cost for other infrastructural needs: Other infrastructural needs such as a laboratory, were assumed at a cost of Ksh 1 million, for one structure. This is a KESSP provision.

What is driving the quantity and cost of teaching and learning materials (including computers)?

Input lifespan: Textbooks including computers were assumed to have a lifespan of 4 years while consumables such as stationary were replaced every year. Maps were deemed to have a span of 5 years. Teaching and Learning Materials (TLM) lifespan used was in line with Ministry of Education policy on TLM.

Input unit cost: Input costs are based on market rates published by the Ministry of Education in the 'Orange Book' after consultation with suppliers. Textbooks were averaged at Ksh 300. When supplementary reading materials are added, the unit cost of key TLM inputs increased to Ksh 331. Computer's price was estimated at Ksh 50,000 by year 2009 for a branded PC. This does not include connectivity and was based on a spot check of market prices. However, the Education Sector Report uses a figure of Ksh 105,000 (Government of Kenya, 2007).

Pupil-input ratio: This is the number of students sharing an input. It varied from one input to another. For instance, Pupil-Textbook Ratio was 1, same as for stationary package, Pupil-Computer Ratio was 12 while Pupil-World map ratio was 480.

Annex 2: Education simulation model outputs for full FSE

Free Secondary Education - FULL	2007	2008	2009	2010	2011
Age 14-17 Population	3,322,843	3,388,806	3,455,587	3,523,182	3,531,879
Std 8 enrolment	723,773	808,845	783,495	911,750	912,236
Transition rate expected to reach 85% by 2010 with some of the remainder joining Youth Polytechnics (%)	40	80	82	85	85
Form 1 enrolment	256,503	580,057	665,446	668,306	777,153
Number expected to join Youth Polytechnics	-	145,592	141,029	164,115	164,202
Public secondary enrolment	897,121	1,263,981	1,675,673	2,097,814	2,584,673
Private secondary enrolment	112,524	123,776	136,154	149,770	164,746
Total Secondary Enrolment	1,009,645	1,387,758	1,811,827	2,247,584	2,749,419
Public secondary GER (%)	27	37	48	60	73
Public and private secondary GER (%)	30	41	52	64	78
Number of public schools	3,163	3,123	3,846	4,704	5,583
Number of private schools	567	596	625	657	689
Number of total schools	3,730	3,718	4,472	5,361	6,273
Resource Requirements					
Teachers (18 ATL)	48,425	48,425	52,666	69,820	87,409
Full Time Equivalent provision for admin duties (FTEP) (210% of number of schools)		5,403	7,349	9,434	11,706
Teachers (18ATL)+FTEP	48,425	53,828	60,015	79,253	99,115
Classrooms required		22,428	31,600	41,892	52,445
Classrooms to replace for depreciation (2%)		427	449	632	638
Additional Classrooms		(486)	8,686	10,292	10,554
Additional Schools Equivalent		(40)	724	858	879
Computers and associated equipment – stock			139,639	174,818	215,389
Additional Computers and associated equipment			139,639	35,178	40,572
Costs (Ksh million)	2006/7	2007/8	2008/9	2009/10	2010/11
Teachers Salaries (18 ATL)	22,029	22,587	24,255	30,622	40,858
Full Time Equivalent Provision for admin duties (FTEP) (210% of number of schools)	2,148	2,697	3,776	5,038	6,500
Total teacher wage bill	24,177	25,284	28,031	35,660	47,358
Classrooms to replace for depreciation		171	179	253	335
Construction of additional classrooms (estimated at Ksh 400,000 furnished)	-	-	3,474	4,117	4,221
Teaching and learning materials (TLM)		6,339	5,922	5,308	5,555
Total costs ATL 18 & FTEP, class depreciation, additional class construction, and TLM	26,613	31,794	37,606	45,338	57,470
Operations and Maintenance (10%)		3,191	3,820	4,610	5,848
Boarding Expenses		4,803	6,367	7,971	9,821
Other infrastructure (laboratories, hostels, offices, sanitary facilities, dining halls, workshops, library, etc)					
Ksh 1million per new school equivalent		(40)	724	858	879
Grand Total (Ksh million)	32,683	39,776	48,457	58,700	73,918
Current Secondary Allocation' (Ksh Mn)	24,342	25,684	26,833	27,864	28,884
Estimated Sec Education Financing Gap (Ksh Mn)	8,341	14,093	21,624	30,836	45,033
Total FSE Capitation (Ksh Million)		9,530	9,742	9,918	11,403
Student annual per capita allocation (all basic inputs)		31,572	29,310	28,380	29,028
Student per capita grant (FSE)		7,540	5,814	4,728	4,412
Computers and associated equipment			6,982	4,370	1,894
Grand total (with computers) Ksh Mn	32,683	39,776	55,439	63,071	75,811
Total FSE capitation (Ksh million)	4,857	9,530	16,724	14,288	13,297
Student annual per capita allocation (all basic inputs)	35,536	31,572	33,477	30,463	29,760
Student per capita grant (FSE)	5,413	7,540	9,980	6,811	5,144
Estimated sec. educ. financing gap if computers provided (Ksh million)	8,341	14,093	28,606	35,207	46,927

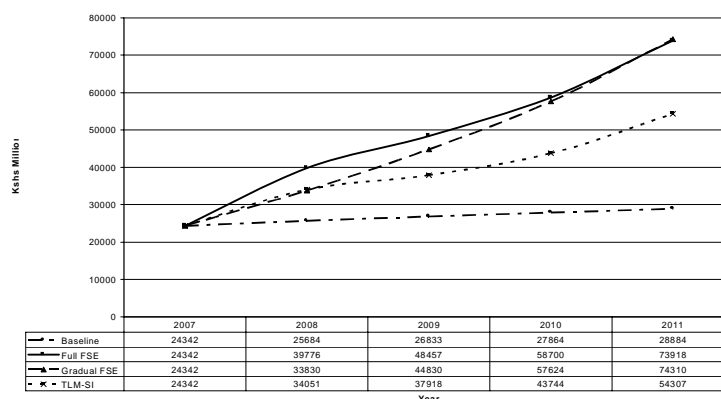
Annex 3: Education simulation model outputs for gradual FSE

Free Secondary Education- GRADUAL	2007	2008	2009	2010	2011
Age 14-17 Population	3,322,843	3,388,806	3,455,587	3,523,182	3,531,879
Std 8 Enrolment	723,773	808,845	783,495	911,750	912,236
Transition Rate expected to reach 85% by 2010 with some of the remainder joining Youth Polytechnics (%)	40	80	82	85	85
Form 1 enrolment	256,503	580,057	665,446	668,306	777,153
Number expected to join Youth Polytechnics		145,592	141,029	164,115	164,202
Public secondary enrolment	897,121	1,263,981	1,675,673	2,097,814	2,584,673
Private secondary enrolment	112,524	123,776	136,154	149,770	164,746
Total Secondary Enrolment	1,009,645	1,387,758	1,811,827	2,247,584	2,749,419
Public secondary GER (%)	27	37	48	60	73
Public and private secondary GER (%)	30	41	52	64	78
Number of public schools	3,163	3,123	3,846	4,704	5,583
Number of private schools	567	596	625	657	689
Number of total schools	3,730	3,718	4,472	5,361	6,273
Resource Requirements					
Teachers (18 ATL)	48,425	48,425	52,666	69,820	87,409
Full Time Equivalent provision for admin. duties (FTEP) (210% of number of schools)		5,403	7,349	9,434	11,706
Teachers (18ATL)+FTEP	48,425	53,828	60,015	79,253	99,115
Classrooms required	21,327	22,428	31,600	41,892	52,445
Classrooms to replace for depreciation (2%)	418	427	449	632	838
Additional classrooms		(486)	8,686	10,292	10,554
Additional schools equivalent computers and associated equipment -stock		(40)	724	858	879
Additional computers and associated equipment			139,639	174,818	215,389
			139,639	35,178	40,572
Costs (Ksh Million)	2006/7	2007/8	2008/9	2009/10	2010/11
Teachers' salaries (18 ATL)	22,029	22,587	24,255	30,622	40,858
Full Time Equivalent Provision for admin duties (FTEP) (210% of number of schools)	2,148	2,697	3,776	5,038	6,500
Total Teacher Wage Bill	24,177	25,284	28,031	35,660	47,358
Classrooms to replace for depreciation	171	179	253	335	
Construction of additional classrooms (estimated at Ksh. 400,000 furnished)	-	-	3,474	4,117	4,221
Teaching and learning materials		3,296	4,173	5,160	5,912
Total costs ATL 18& FTEP, class depreciation, additional class construction, and TLM	25,963	28,751	35,857	45,189	57,827
Operations and Maintenance (10%)	2,523	2,887	3,645	4,595	5,883
Boarding Expenses		2,204	4,663	7,058	9,821
Other infrastructure (Laboratories, Hostels, offices, sanitary facilities, dining halls, workshops, library, etc) Ksh 1million per new school equivalent		(40)	724	858	879
Grand Total (Ksh Million)		30,764	33,830	44,830	57,624
Current Secondary Allocation (Ksh Mn)	24,342	25,684	26,833	27,864	28,884
Estimated Sec Educ Financing Gap (Ksh Mn)	6,422	8,147	17,997	29,760	45,426
Total FSE Capitation (Ksh. Million)		6,183	7,818	9,755	11,795
Student annual per capita allocation (all basic inputs)		26,868	27,145	27,867	29,179
Student per capita grant (FSE)		4,892	4,666	4,650	4,564
Computers and associated equipment			6,982	4,370	1,894
Grand Total (with computers) Ksh Mn	30,764	33,830	51,812	61,995	76,204
Total FSE Capitation (Ksh. Million)		6,183	14,800	14,125	13,689
Student annual per capita allocation (all basic inputs)		26,868	31,312	29,950	29,912
Student per capita grant (FSE)		4,892	8,833	6,733	5,296
Estimated Sec Education Financing Gap if computers provided (Ksh Mn)	6,422	8,147	24,979	34,131	47,319

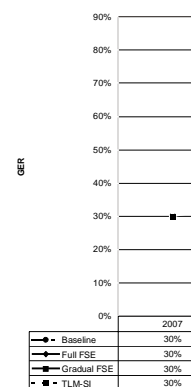
Annex Table 4: Education Simulation Model Outputs for TLM Provision

TLM-Free Secondary Education	2007	2008	2009	2010	2011
Age 14-17 population	3,322,843	3,388,806	3,455,587	3,523,182	3,531,879
Std 8 enrolment	723,773	808,845	783,495	911,750	912,236
Transition rate expected to reach 72% by 2010	0.40	0.64	0.69	0.72	0.72
Form 1 enrolment	256,503	464,253	559,858	566,082	658,294
Number expected to join Youth Polytechnics (it is proposed that FSE be extended to YPs)		145,592	141,029	164,115	164,202
Public secondary enrolment	897,121	1,148,178	1,458,286	1,785,488	2,163,026
Private secondary enrolment	112,524	123,776	136,154	149,770	164,746
Total Secondary Enrolment	1,009,645	1,271,954	1,594,440	1,935,257	2,327,772
Public secondary GER	0.270	0.339	0.422	0.507	0.612
Public and private secondary GER	0.304	0.375	0.461	0.549	0.659
Number of public schools	3,163	3,123	3,605	4,251	4,933
Number of private schools	567	596	625	657	689
Number of total schools	3,730	3,718	4,230	4,908	5,622
Resource Requirements					
Teachers (18 ATL)	48,425	48,425	47,841	60,762	74,395
Teachers (18ATL)+FTEP	48,425	53,538	54,357	68,871	84,267
Classrooms required	21,327	22,428	28,704	36,457	44,637
Classrooms to replace for depreciation (2%)	418	427	449	574	729
Additional classrooms	-1,587	- 86	5,790	7,753	8,180
Additional schools equivalent	-132	-40	483	646	682
Computers and assoc. equip - stock			121,524	148,791	180,252
Additional computers and ass. equip			121,524	27,267	31,461
Costs (Ksh Million)	2006/7	2007/8	2008/9	2009/10	2010/11
Teachers salaries (18 ATL)	22,029	22,587	23,075	27,140	35,115
Full Time Equivalent provision for admin. duties (FTEP)(210% of number of schools)	2,148	2,551	3,346	4,329	5,480
Total teacher wage bill	24,177	25,138	26,421	31,469	40,595
Classrooms to replace for depreciation	167	171	179	230	292
Construction of additional classrooms (estimated at Ksh 400,000 furnished)	0	0	2,316	3,101	3,272
Teaching and learning materials (TLM)	2,268	5,683	5,115	4,379	4,591
Total costs ATL 18& FTEP, class depreciation, additional class construction, and TLM	26,613	30,992	34,032	39,180	48,750
Operations and maintenance (10%)	2,661	3,099	3,403	3,918	4,875
Boarding expenses	3,409	4,363	5,541	6,784	8,219
Other infrastructure (laboratories, hostels, offices, sanitary facilities, dining halls, workshops, library, etc)					
Ksh 1million per new school equivalent	-132	-40	483	646	682
Grand Total (Ksh Million)	32,683	38,454	43,459	50,528	62,526
Current Secondary Allocation (Ksh Mn - MPER 07)	24,342	25,684	26,833	27,864	28,884
Estimated Sec Educ Financing Gap (Ksh Mn) - no computers	8,341	12,770	16,626	22,664	33,641
Total FSE Capitation (Ksh. Million) - no computers	4,930	8,782	8,518	8,297	9,466
Student annual per capita allocation (all basic inputs)	36,431	33,491	29,802	28,299	28,907
Student per capita grant (FSE) - no comps	5,495	7,649	5,841	4,647	4,376
Computers and associated equipment			6,076	3,720	1,468
Grand Total (with computers) Ksh Mn	32,683	38,454	49,535	54,248	63,994
Total FSE Capitation (Ksh. Million)	4,930	8,782	14,594	12,017	10,934
Student annual per capita allocation (all basic inputs)	36,431	33,491	33,968	30,383	29,585
Student per capita grant (FSE) - with comps	5,495	7,649	10,008	6,730	5,055
Estimated sec. education financing gap if computers provided (Ksh million)	8,341	12,770	22,703	26,384	35,110

Annex Figure 1: Comparison of scenarios by input costs (Ksh Million)



Annex Figure 2: Comparison of scenarios by output



Other Related KIPPRA Papers

1. Kimalu, P. K., Nafula N. N., Manda D. K., Mwabu, G. and Kimenyi, M. S. (2001), Education indicators in Kenya. KIPPRA Working Paper No. 4.
2. Bedi, A., Kimalu, P. K., Manda, D. K. and Nafula, N. N. (2002), The decline in primary school enrolment in Kenya. KIPPRA Discussion Paper No. 14.
3. Vos R., Bedi, A., Kimalu, P., Manda, D. K., Nafula N. N. and Kimenyi, S. (2004), Achieving universal primary school education in Kenya. KIPPRA Discussion Paper No. 46
4. Onsomu, E. N., Muthaka, D., Ngware, M. and Kosimbei, G. (2006), Financing of secondary education in Kenya: Costs and options. KIPPRA Discussion Paper No. 55.
5. Onsomu, E. N., Muthaka, D. I., Ngware, M. W. and Manda, D. K. (2006), Determinants and strategies for expanding access to secondary education in Kenya. KIPPRA Discussion Paper No. 63.
6. Ngware, M. W., Onsomu E. N. and Manda, D. K. (2006), Private sector investment in education and training: A case of tertiary education in Kenya. KIPPRA Special Report No. 6.
7. Impact of primary school education inputs and outputs in Kenya (forthcoming discussion paper)
8. Private sector investment in primary and secondary education in Kenya (forthcoming discussion paper)