

Secondary and Primary Education in Jamaica: Financial Requirements for Quality

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In attempting to discuss the financing of the education system in Jamaica we must first postulate what we think the ideal school should look like. This exercise will not seek to address the issue of financing the central administrative cost of the education system, i.e. the cost of running the Ministry of Education. We make no attempt to cost the transition from where we are to where we want to be. What we do is to construct what we perceive to be a reasonable school system and ask ourselves what it would cost to maintain such a system; we therefore jump immediately to the desired configuration.

We are concerned only with the operation of the school, not the provision of welfare services through the school. This means that we do not consider the provision of meals or textbooks, or other welfare services, all of which might be vital for the success of the educational process, but which are strictly speaking outside of the central mandate of a school.

High School

We start with the secondary system. We do not consider boarding schools. Our model high school will consist of 1,500 students, distributed as follows: 300 (20%) in the sixth form and 1,200 (80%) between Grades 7 – 11. The average class size in the sixth form is 25 while between Grades 7 – 11 it is 35. The average class size throughout the school is therefore 33. Our model school therefore has 7 streams in each grade between Grades 7 – 11. It is assumed that 150 students enter the 6th form each year i.e. 62.5% of the Grade 11 cohort.

The current secondary system has 246,965 students (2010/11) of which 8,798 are in sixth form i.e. 3.6%, a far cry from the targeted 20%. Not all of the current students are in designated secondary institutions. 6,233 are in All Age Schools (158) and 17,300 are in Primary & Junior High Schools (87). The secondary education system should seek to educate all secondary students in designated secondary school i.e. the approximately 23,500 students of secondary age who are currently housed in All Age and Primary & Junior High Schools should be transferred to designated secondary institutions. The shift system should also be ended and these students transferred to institutions with regular school hours. There are currently 107 institutions operating the shift system – 25 primary; 9 all age; 32 primary & junior high; 40 secondary high; and 1 technical high. We do not know the precise number of students being educated on a second shift. This number does not affect our steady state funding estimates; what it affects is the transition path from where we are to where we would like to go.

Based on our assumption of 1,500 students being the ideal school size, the current secondary school population would require 165 schools. There are currently 165 designated secondary schools in the

public education system – 149 secondary high, 14 technical high and 2 agricultural schools. Because the population is not uniformly distributed throughout the country we cannot assume that our simple math implies that we do not need any additional schools. If schools were to be built to accommodate the 23,500 secondary students who are not in designated secondary schools we would need an additional 16 schools. It is therefore reasonable that we require additional schools in the range of 0 – 16. Demographic data and existing capacity would have to be used to identify the precise number of additional schools needed. Expansion of some existing schools might be possible to absorb some students, rather than the construction of ‘greenfield’ schools.

The pupil/teacher ratio in our model school is 19:1. This means that in our 1,500 pupil school there will be 79 teachers, inclusive of a principal, 2 vice principals, 1 librarian and 2 guidance counselors (we do not take account of teachers on leave). The current pupil/teacher ratio in exclusively designated secondary schools is 19.02:1 (19.2:1 in secondary high; 17:8 in technical high and 10:1 in agricultural high – these figures include teachers on leave). There are 581 teachers in the All Age Schools who teach secondary students and 1,337 in the Primary & Junior High Schools. The pupil/teacher ratio in these schools combined is 12.2:1. Great care must be exercised in interpreting this number as it is very likely that these teachers also teach at the primary level, so the ratio would be greatly understated.

Our model school will have all teachers being trained university graduates. The current state of affairs is that 44% of all teachers teaching at the secondary level have this level of education/training. Both All Age and Primary & Junior High Schools have 47% of their teachers so trained; Secondary High Schools have 44% while Technical High and Agricultural High Schools have 40% and 33% respectively.

In our model school 30% of teachers (excluding principal and vice principals) will be senior teachers. Currently 17% of teachers who teach secondary students are senior teachers. 18% of the teachers in the Technical High and Secondary High Schools are senior teachers while 14% of teachers in Agricultural High and 11% in All Age Schools are senior teachers.

In order to estimate academic staff cost per annum we take the current salary scale as given, make adjustments for inflation and make assumptions as to where on the scale the ‘average’ teacher would fall. All academic staff salaries are calculated using the 2008/2010 Heads of Agreement between the Ministries of Finance and the Public Services and Education on the one hand, and the Jamaica Teachers’ Association representing teachers in the government service on the other hand. The contract period is from April 2008 to March 31, 2010. These staff costs are adjusted for inflation first to March 2011 (7.9%) and then to March 2012 (7.3%).

Personnel Cost

Academic

Principal

We assume that the average principal is a principal of a Secondary III school being paid at the 4th increment of a 6 increment scale. All values given below are in J\$.

Basic Salary	2,710,821
Housing	372,118
Travelling	142,405
Special Teachers' Allowance	493,224
Special Responsibility	139,099
Book Allowance	117,282
Total	3,974,949

Vice Principal

We assume that a vice principal is at the 4th increment of a 6 increment scale.

Basic Salary	2,033,394
Housing	279,126
Travelling	142,405
Special Teachers' Allowance	221,033
Special Responsibility	139,099
Book Allowance	117,282
Total	2,932,339

Senior Teacher

We assume that a senior teacher is at the 9th increment on an 11 increment scale

Basic Salary	1,429,114
Travelling	142,405
Special Teachers' Allowance	41,419
Special Responsibility	139,099
Book Allowance	117,282
Total	1,869,319

Teacher

The assumption is the teacher is at the 4th increment on an 11 increment scale

Basic Salary	1,281,777
Special Teachers' Allowance	365,825
Book Allowance	117,282
Total	1,764,884

Given our assumption that 30% of the teachers (excluding the principal and vice principals) will be senior teachers, our representative teacher is $0.3(\text{senior teacher}) + 0.7(\text{teacher})$. Such a representative teacher will receive emoluments valued at \$1,796,215 ($= 0.3(1,869,319) + 0.7(1,764,884)$) per annum.

Academic staff cost at our model high school is given in the table below

Academic Staff Cost			
Numbers	Position	Per unit cost J\$	Cost J\$
1	Principal	3,974,949	3,974,949
2	Vice Principal	2,932,339	5,864,678
76	Teachers	1,796,214	136,512,302
	NIS		2,429,442
	NHT		4,383,240
	Total		153,164,601

Administration

Administrative salaries were not taken as given. In our model school these payments are varied. We will attempt to justify the recommendations which we make.

Secretary/Bursar

The position of Secretary/Bursar should be raised to the level of a Vice Principal. This person is in charge of the administrative arm of the school. Overall responsibility for the running of the school resides with the principal. The bursar should report to the principal and should be put in charge of all the support services in the school – accounting, human resource management, property and grounds, security, record keeping and any other administrative function. Current salary levels of approximately \$1.2 million (adjusted for inflation) are totally inadequate for the scale of responsibility. At these salary levels it is unlikely that a school will be able to attract/retain the skill set required to carry out this function effectively.

Assistant Bursar

An assistant bursar should be paid at the same level of a teacher. The broad scope of oversight which the bursar has is likely to require some delegation to an assistant bursary. Current levels of approximately \$831,000 (adjusted for inflation) will definitely not attract the required skill set.

Registrar

Each school should have a registrar paid at the level of a teacher. The role of the registrar is going to be vital if the teaching staff is to have immediate access to each student's history. The registrar in a school should be versed in Information Technology, be competent in storing, retrieving and manipulating data. Without current information being always accessible the ability to design a targeted response to each student's need in a timely fashion becomes impossible. The current remuneration of approximately \$650,000 is very unlikely to deliver a person who is to become the information centre of the school. This person could also be relied upon to keep personnel records.

School Nurse

Currently nurses are paid the basic pay of nurses in the government service (approximately \$930,000). However nurses in the public hospitals and other public facilities are able to earn sessional payments

which results in the salary package for a school nurse being very uncompetitive. The result is that nurses tend to spend a very short period of time as a school nurse. It is proposed that nurses be paid at the level of a teacher.

Plant Manager

A school is a complex plant, which requires many different things to keep the school functions smoothly. Children tend to be more destructive than adults, so within a school things are constantly being broken and in need of repair. A plant manager is required to ensure the smooth functioning of the school plant and equipment, inclusive of esthetics. A person who can interact with and contact tradesmen and who therefore have some knowledge of estate management, plumbing, carpentry, metal work, electrical issues is required. This person cannot be seen as a low level ancillary worker. This person is a vital part of the administrative structure of a school. It is proposed that a salary of \$1 million be attached to this post.

Our model high school would incur the following staff cost for administration

Administrative Staff Cost			
Number	Position	Unit Cost J\$	Cost J\$
1	Bursar	2,932,339	2,932,339
2	Assist. Bursars	1,764,884	3,529,768
1	Registrar	1,764,884	1,764,884
1	Plant Manager	1,000,000	1,000,000
1	Nurse	1,764,884	1,764,884
4	Secretaries	950,000	3,800,000
2	Lab Technicians	600,000	1,200,000
1	Library Assistant	600,000	600,000
3	Clerical Assistants	600,000	1,800,000
	NIS		454,279
	NHT		545,135
	Total		19,391,289

Ancillary

Ancillary Staff costing are presented in the table below

Ancillary Staff Cost			
Number	Position	Per Unit Cost J\$	Cost J\$
6	Cleaners	438,284	2,629,704
5	Grounds men	438,284	2,191,420
4	Watchmen	462,305	1,849,220
1	Messenger	407,038	407,038
	NIS		176,935
	NHT		212,251
	Total		7,466,567

Administrative Expenses

There are some costs which a school must incur which are not related to the personnel cost of the people employed to the school. These we have chosen to collectively call Administrative Expenses. Included in this category are utility bills (electricity, water, and telephone), supplies for the school – cleaning material, toiletries, stationary, security etc. We estimate these costs for our model high school to be \$30 million per annum

Teaching/Learning Supplies

These inputs are vital for the school's primary mission. This category includes material for laboratories, libraries, classroom material (chalk/markers, duster, maps etc). We estimate these expenditures for our model school to be \$6 million per annum.

Co-curricular Expenditure

Spending on this category throughout the secondary school system is very uneven. There are schools with highly developed sports programmes (including school challenge quiz), and those which have well established cultural programmes (choir, orchestra, dance groups) which utilize vast amount of resources in keeping these programmes going and which incur significant expenses in moving these groups around the island (or even overseas). Many of these schools spend significantly in excess of our recommendation. We are however trying to estimate what it would cost to have a vibrant co-curricular programme which would give each student an opportunity to be involved meaningful in something. We estimate that a co-curricular budget of \$8 million should give students of our model school a very rich sports/cultural/service experience. The idea is to try to get as many students as possible involved in some activity outside of the classroom as these activities are essential complements to the classroom and through which much of the social aspect of education is transmitted.

Maintenance Cost

We estimate a depreciation rate of 7.5% per annum. Maintenance would therefore require that each school spends 7.5% of the replacement cost of the school each year on maintenance. We estimate that the cost of building a school which would accommodate 1500 students is \$700 million. This would mean that the annual maintenance cost for our model school would be \$52.5 million.

Estimated Cost of Operating Our Model High School

The table below summarizes the cost of operating our model school for a year.

Estimate for the Operation of the Model High School		
	Cost J\$	Cost per Student J\$
Total Staff Cost	180,022,457	120,015
Academic Staff	153,164,601	102,110
Administrative Staff	19,391,289	12,928
Ancillary Staff	7,466,567	4,978
Administrative Expenses	30,000,000	20,000
Teaching Supplies	6,000,000	4,000
Co-curricular Expenditure	8,000,000	5,333
Total Recurrent Expenditure	224,022,457	149,348
Maintenance	52,500,000	35,000
Total Annual Cost	276,522,457	184,348

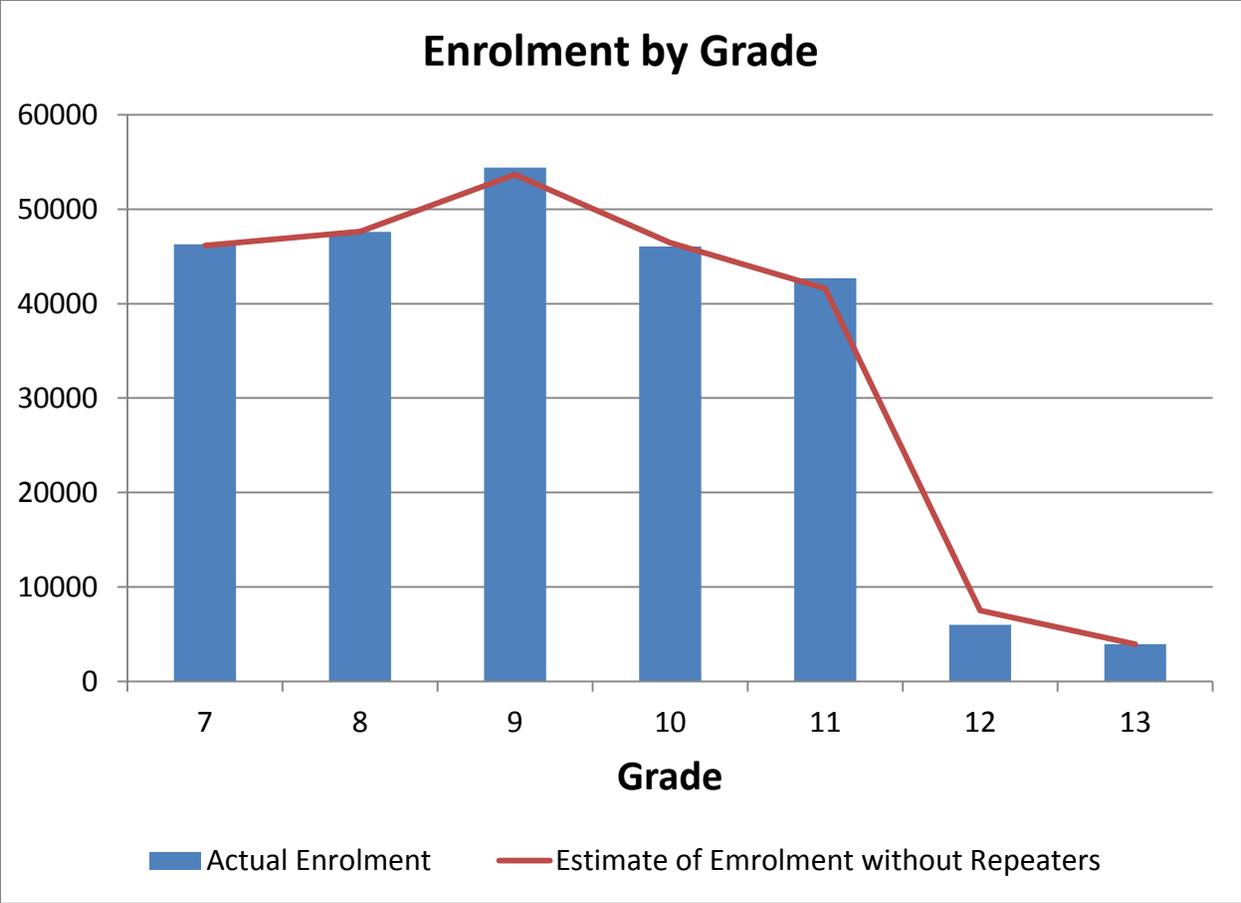
Note that these estimates do not include cost of teachers on leave, any welfare programmes delivered through the school (school feeding or school books) or the cost for any net addition to the capital stock of the school.

Progression through the Secondary System

Our data indicate the following distribution of students by grade throughout the secondary system

	Grades						
	7	8	9	10	11	12	13
Actual Enrolment	46,292	47,613	54,395	46,057	42,679	6,007	3,932
Estimated Enrolment without repeaters	46,152	47,646	53,664	46,437	41,605	7,526	3945

This information is presented graphically below



The estimation of the grade population without repeaters is based on subtracting the repeaters of a particular grade from the grade population and adding them to the grade population of the higher grade. This is a crude estimate assuming that the number of repeaters remain roughly the same from year to year. The highest numbers of repeaters occur at Grade 11 (1,532) and Grade 9 (838). According to the data for 2010/11 the expected population of Grade 8 was approximately 1,500 more than the expected population of Grade 7. The expected population of Grade 9 was approximately 6,000 more than the expected population of Grade 8. It is difficult to explain such large differences in the grade populations since population bulges are not expected to be so significant in a one year period. The population of Grade 9 students housed in All Age and Primary & Junior High Schools is approximately 9,100. The Grade 9 population in these schools is approximately 1,500 more than the Grade 8 population. Of the overall difference of 6,000 students between Grades 8 and 9, the All Age and Primary & Junior High schools accounted for a quarter.

The grade population falls by approximately 12,000 between Grades 9 and 11. This is very significant. If we think that the Grade 9 bulge is artificial and instead use the Grade 8 figure as a more representative number of what the expected population of Grade 9 should be, there is still an approximately 6,000 fall in the student population between Grades 9 and 11. The attrition rate between Grades 9 and 11 is high. It is not unreasonable to assume that a significant part of the 12,000 difference between Grades 9 and 11 are accounted for by students coming from the All Age and Primary & Junior High Schools. These

students would have finished the lower cycle of the secondary system in these schools but would have had to transfer to other schools for the upper cycle, since All Age and Primary & Junior High Schools do not offer the upper cycle. The secondary system is in need of approximately 6,000 additional spaces in Grade 11, if the attrition rate between Grade 9 and Grade 11 is to fall to zero. Likewise an additional 1,200 spaces would be required for Grade 10.

Costing of the Entire Secondary System

Using our estimate of \$184,348 as the cost of educating each secondary student we estimate the cost of educating the total existing student population for a year. We also simulate the replication of our model school throughout the secondary system and cost it. We assume:

- 1) We move all students not in exclusively designated secondary institutions into such institutions;
- 2) We take the average of the Grade 7 and Grade 8 population as the 'normal' cohort of students entering the secondary system each year and we project that population over 5 years of secondary schooling;
- 3) We also promote 62.5% of the Grade 11 cohort into sixth form (Grades 12 and 13) for two years.
- 4) Repetition rate is held at the current level of 1.125%.

Our simulation assumes a grade population of 46,960 in each grade between 7 and 11 i.e. a total student population between Grades 7 – 11 of 234,800. We assume a sixth form population of 58,700. This would mean a total high school population of 293,500. If we allow repeating at the current rate of 1.125% this would move the high school population to 297,200.

	Number of Students	Total Cost \$million
Existing	246,975	45,530
Simulation	297,200	54,788

The Estimates of Expenditure for the Fiscal Year 2011/12 had the Government of Jamaica allocating \$22,744 million to the secondary sector. This sum represents 50% of what we estimate it would take to educate existing secondary school students according to the model we have outlined above. If we were able to retain the entire secondary age population for grades 7 – 11 and a six form population of 20% of the entire secondary school system, the current allocation would amount to 41.5% of the required funding.

Using our estimated cost of \$184,348 per student at the secondary level and our estimate that the government is only supplying approximately half of this amount, the question must be raised as to additional sources of funding. Cost sharing must be considered. If parents were asked to bear directly 10% of the cost of a child's education at high school this would require a payment of \$18,435 per annum. A payment plan where parents pay in three installments would mean a payment of \$6,145 each term per child. A 15% contribution would mean \$27,653 per year or \$9,218 per term. Whatever the figure chosen there will be some parents who either cannot or will not pay. Since there is a social

benefit to education the option of exclusion cannot be pursued. The government will therefore have to pay for those who are unable to pay. What the market can bear is as much a political as well as an economic question. There needs to be some coalescing in the society around the idea that parents will have to bear directly a portion of the cost of secondary schools. The society needs to understand that the better resourced schools do not rely exclusively on the government for resources. If a significant portion of the population does not contribute to the cost of running the high schools which their children attend, the gulf between the high performing secondary schools and the others will continue. This is the single biggest reason for the intense competition at Grade 6 for placements in secondary schools – the relatively small percentage of well-resourced and therefore high performing secondary schools.

Canteens can be outsourced with a concessionaire fee paid to the school. Such a model would relieve the school of administrative cost of managing canteens. We estimate that a school with a population of 15,000 should be able to command a concessionaire fee of approximately \$10 million per annum.

Should schools implement a 10% cost-sharing scheme as well as outsource their canteen operations we estimate that they would be able to collect approximately 14% of the cost of running the school. This with 50% coming from the government would mean that there is a short fall of approximately 36%. If the cost-sharing was 20% and there was full compliance, this along with the canteen earning would mean that the school would be able to raise 24% of its financing cost, leaving a deficit of 26%. Of course these figures represent upper bounds, and further refinements would have to be made to estimate the extent of compliance and hence the amount of additional resources which would actually flow into the schools. Some amount of deficit will still exist, probably somewhere between 30% and 40%. It might be impossible to close this gap financially, and therefore it will be closed in terms of quality i.e. we might not be able to get to our model school but must be satisfied at this time with something less. Improvements in the funding prospects for the secondary system will improve with overall economic expansion. If the economy grows on average by 3% per annum, all other things remaining constant in 9 years the government would be able to spend 30% more on education than it currently spends (if the average growth rate is 2% it will take 14 years). Economic growth not only implies that the government is able to spend more, but also that parents are in a better position to contribute a larger share of the cost of their children's education. It might therefore not be unrealistic to think that the country over the next 10 to 20 years will be in a position to finance a more equitable high quality secondary system.

It is common in countries which seek to expand education that they first concentrate on access, largely ignoring quality, at first. After sufficient progress has been made on access, education policy makers turn their attention to the issue of quality. Jamaica has had fairly good access at the primary level for a very long time, and now enjoys significant improvement in access at the secondary level. There is great disparity in output from different schools, which indicates that the issue of system-wide quality needs to be addressed.

Primary School

We start with our ideal primary school consisting of 450 students. Currently primary education is delivered in four types of institutions: Primary Schools (grades 1-6 and public); Preparatory Schools (grades 1-6 and private); All Age Schools (grades 1-9); and Primary & Junior High Schools (grades 1-9) both public institutions. The average class size in our model school will be 25 students. The student/teacher ratio in such a school is 21.4:1 (this does not include teachers on leave). Included in the teacher corps are a principal, a vice principal, a guidance counselor and a librarian (teachers on leave are not included). It is assumed that the vice-principal is also a classroom teacher. The current student/teacher ratios are: Primary 24.6:1; All Age – 24:1; Primary & Junior High – 25.5:1; and Preparatory – 16:1. For the public system it is 24.6:1 (these figures exclude teachers on leave and administrators). In our configuration of the educational system, public primary education would be delivered exclusively in primary schools.

We make the same assumption about a primary school teacher as we do about a high school teacher i.e. the teacher is a trained graduate. Currently 42% of teachers teaching at the primary level are so trained (42% in Primary Schools; 40% in All Age Schools; 46% in Primary & Junior High).

Personnel Cost

Academic

Principal

We assume that the average principal is a principal of a Primary III school being paid at the 4th increment of a 6 increment scale. We use the rates given in the Heads of Agreement concluded between the Ministries of Finance and the Public Service, and Education on the one hand and the Jamaica Teachers' Association on the other dated October 28, 2008 (adjusted for inflation). All values given below are in J\$.

Basic Salary	2,064,407
Housing	280,205
Travelling	142,405
Special Teachers' Allowance	61,738
Special Responsibility	139,099
Book Allowance	117,282
Total	2,805,136

Vice Principal

We assume that a vice principal is at the 4th increment of a 6 increment scale.

Basic Salary	1,563,391
Housing	214,663
Travelling	142,405
Special Teachers' Allowance	61,738
Special Responsibility	139,099
Book Allowance	117,282
Total	2,238,578

We further adjust the Special Teachers' Allowance payable to vice principals to the level paid to principals to sufficiently differentiate the payments to a vice principal and a teacher.

We assume the same rate of pay for teachers in the primary schools as in high schools. We also assume the same ratio of senior teachers to junior teacher. The average cost of a teacher is therefore \$1,796,215 per annum

Academic staff cost at our model Primary school is given in the table below

Academic Staff Cost			
Numbers	Position	Per unit cost J\$	Cost J\$
1	Principal	2,805,136	2,805,136
1	Vice Principal	2,238,578	2,238,578
19	Teachers	1,796,214	34,128,006
	NIS		620,434
	NHT		1,119,398
	Total		40,911,613

Administration

The administrative staff cost for our model school are as follows:

Administrative Staff Cost			
Number	Position	Unit Cost J\$	Cost J\$
1	Bursar/Registrar	2,238,578	2,238,578
1	Maintenance Manager	750,000	750,000
1	Nurse	1,764,884	1,764,884
1	Secretary	950,000	950,000
2	Clerical Assistants	600,000	1,200,000
	NIS		170,515
	NHT		204,618
	Total		7,278,596

For the primary school we do not designate a plant manager, instead we use a maintenance manager – a different nomenclature is used to indicate that the tasks required of this person at a primary school is likely to be less onerous than his/her counterpart at a high school.

Ancillary

Ancillary Staff costing are presented in the table below

Ancillary Staff Cost			
Number	Position	Per Unit Cost J\$	Cost J\$
2	Cleaners	438,284	876,568
2	Grounds men	438,284	876,568
2	Watchmen	462,305	924,610
1	Messenger	407,038	407,038
	NIS		77,120
	NHT		92,512
	Total		3,254,416

Administrative Expenses

Our estimate for administrative expenses (non-salary cost) for our model primary school is \$4.5 million per year. This will cover utility bills, cleaning material, stationery etc.

Teaching/Learning Supplies

We estimate the cost for teaching/learning supplies to be \$1.8 million.

Co-curricular Expenditure

Co-curricular activities are estimated to cost \$1.8 million.

Maintenance Cost

In estimating the maintenance cost of our model primary school we make the assumption that a primary school student utilizes approximately 50 percent of the space utilized by a high school student. A high school has more space dedicated to specific activities – science laboratories, gymnasiums, auditoriums etc. For a high school student we estimated a maintenance cost of \$35,000 per student. We estimate a maintenance cost at primary school of \$18,000 per student (making allowance for diseconomies of scale).

Estimated Cost of Operating Our Model Primary School

The table below summarizes the cost of operating our model primary school for a year.

Estimate for the Operation of the Model Primary School		
	Cost J\$	Cost per Student J\$
Total Staff Cost	51,444,625	114,321
Academic Staff	40,911,613	90,914
Administrative Staff	7,278,596	16,175
Ancillary Staff	3,254,416	7,232
Administrative Expenses	4,500,000	10,000
Teaching Supplies	1,800,000	4,000
Co-curricular Expenditure	1,500,000	3,333
Total Recurrent Expenditure	59,244,625	131,655
Maintenance	8,100,000	18,000
Total Annual Cost	67,344,625	149,655

Note that these estimates do not include cost of teachers on leave, any welfare programmes delivered through the school (school feeding or school books) or the cost for any net addition to the capital stock of the school.

Costing of the Entire Primary System

Currently there are 273,802 primary students (grades 1-6) distributed as follows:

Primary Schools	191,557
All Age Schools	33,101
Primary & Junior High	33,924
Total Public Primary System	256,582
Preparatory	15,220
Total	273,802

We are concerned with the public education system. Some parents will choose private education for their children. At an annual cost of \$149,655/student the entire public primary system would cost \$38,698 million.

Currently 3.4% (8,789) of the primary students in the public system repeat a grade annually (3% - Primary; 5.5% - All Age; 3.5% - Primary & Junior High).

Repetition by grade for 2010/11 is presented below

Repetition by Grade 2010/11					
Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
1,664	543	493	581	860	4,648

Allowing for such a repeat rate adds \$1,315 million to the primary budget i.e. if there were no repeaters the annual primary school budget would be approximately \$37,383 million. The following table summarizes this information.

	Number of Students	Cost (\$ million)
Current Situation (3.4% repeaters)	256,582	38,698
No repeaters	249,796	37,383

It might be cheaper to put in place mechanisms which reduce repeaters than incurring the cost of \$1,315 million annually to accommodate them.

The estimates of expenditure for the fiscal year 2011/12 had the Government of Jamaica allocating \$21,854 million to the primary education sector. This represents 56.5% of our estimated cost of what it should take to educate the students currently in the public primary system. The notion of a 'free' primary education system has been practiced in Jamaica for a very long time. This has led to a sparsity of resources. Approximately 5.6% of the children of primary school age are being educated in the private sector (prep schools). Politically, it might be impossible to impose user fees at the primary level. The resourcing of this sector might be more dependent on improvements in public finances than the secondary or tertiary levels.

Comparison between the cost of our model Primary and High Schools

For ease of comparison we present below tables of our model primary and secondary schools.

Comparison between cost (J\$) of model high and primary schools					
	High School	Share %	Primary School	Share %	Raito High:Primary
Total Staff Cost	180,022,457	65.1	51,444,625	76.4	3.5
Academic Staff	153,164,601	55.4	40,911,613	60.7	3.7
Administrative Staff	19,391,289	7.0	7,278,596	10.8	2.7
Ancillary Staff	7,466,567	2.7	3,254,416	4.8	2.3
Administrative Expenses	30,000,000	10.4	4,500,000	6.7	6.7
Teaching Supplies	6,000,000	2.2	1,800,000	2.7	3.3
Co-curricular Expenditure	8,000,000	2.9	1,500,000	2.2	5.3
Total Recurrent Expenditure	224,022,457	81.0	59,244,625	88.0	3.7
Maintenance	52,500,000	19.0	8,100,000	12.0	6.5
Total Annual Cost	276,522,457	100	67,344,625	100	4.1

Our model high school has 3.3 times as many students as our model primary school. This ratio must be borne in mind when interpreting the ratio between high school and primary schools in the table above.

Comparison between cost (J\$) per student in model high and primary schools					
	High School	Share %	Primary School	Share %	Raito High:Primary
Total Staff Cost	120,015	65.1	114,321	76.4	1.1
Academic Staff	102,110	55.4	90,914	60.7	1.1
Administrative Staff	12,928	7.0	16,175	10.8	0.8
Ancillary Staff	4,978	2.7	7,232	4.8	0.7
Administrative Expenses	20,000	10.8	10,000	6.7	2.0
Teaching Supplies	4,000	2.2	4,000	2.7	1.0
Co-curricular Expenditure	5,333	2.9	3,333	2.2	1.6
Total Recurrent Expenditure	149,348	81.0	131,655	88.0	1.1
Maintenance	35,000	19.0	18,000	12.0	1.9
Total Annual Cost	184,348	100	149,655	100	1.2

It costs 20% more to educate a secondary student in our model high school than it costs to educate a primary student in our model primary school. In the above table any ratio which is less than 1 indicates economies of scale in the secondary school e.g. the administrative staff cost per student in a high school is 80% of the administrative staff cost per student in a primary school because in the high school the administrative staff cost while being higher than in the primary school is shared over a relatively larger number of students. The big differences between the per student costs in high and primary schools are in the areas of administrative expenses, co-curriculum activity and maintenance which are 100%, 60% and 90% higher respectively. Larger space per student in high school implies higher per student utility bills and higher per student usage of cleaning material. High school students are likely to consume more stationery than primary school students, as more handout and correspondence for home will be utilized at the secondary than the primary level. High school co-curriculum activities are more expensive per student than primary school activities. Since each high school student occupies more space and in particular more specialized space than a primary school student, maintenance cost will be significantly higher.

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