Analysis of the Unit Costs of the Government's Provision of Pre-Primary Education in Tanzania

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Abstract

The realisation of universal pre-primary education in any country requires serious government intervention to finance it. To be able to provide adequate funds, governments require information regarding the annual unit cost of educating a child in a pre-primary class. This study uses the 2012 Tanzanian census data to determine the unit cost of providing pre-primary education in public pre-primary schools in Tanzania for two years. The study employed the qualitative research methodology using a basic/generic research design. Data were collected from existing documents, through observation and telephone and face-to-face interviews with head teachers and pre-primary class teachers in 260 primary schools located in Dar es Salaam and Pwani regions. The analysis was performed using the Excel program and content analysis. The findings revealed that the public pre-primary unit cost is 517,262 and 221,960 Tanzanian shillings (Tshs.) for effectively implementing the financing strategies for year one and the following year, respectively. This amount means that, for the first year of financing pre-primary education, the unit cost is Tshs. 2,666 or $1.25[1] for each school day and Tshs. 53,325 or $25.15 for 20 school days per month. For the following year, the unit cost is Tshs. 1,144 or $0.54 a day and Tshs. 22,882 or $10.79 a month. The paper suggests the need to finance pre-primary education on the basis of the actual unit cost. Hence, the optimal cost of financing pre-primary pupils is US$ 25 a month in the first year of establishing a preschool programme and US$ 10 in the following year. This sum could be provided as part of the capitation and development grants.

Keywords: pre-primary education, unit cost, Tanzania

Introduction

Pre-primary education is associated with a number of benefits, including serving as a foundation for all other levels of education (Psacharopoulos, 2014). It is emphasised that pre-primary education should be universal and extended to all children (Haque1, Nasrin, Yesmin& Biswas, 2013). Tanzania, like many other developing countries, recognises the importance of pre-primary education, as evidenced by the 1995 and 2014 education policies which require each primary school to have a pre-primary class admitting 5-6 year olds. Following these policy directives, pre-primary classes have been introduced in the majority of primary schools in

[1] I$= 2120 Tanzanian shillings

Tanzania and, in most of these, attending pre-primary classes is one of the requirements for admission to class one. Yet, the evidence of some research (see for example UWEZO, 2013) suggests that children are graduating from primary school without having acquired basic literacy and numeracy skills, meaning that they are unable to read, write or do simple arithmetic. It is surprising to note that the problem persists 20 years after implementation of the government directives regarding the introduction of pre-primary classes, which it was anticipated would provide an opportunity for children to learn and master the basic literacy and numeracy skills before they join class one. However, this has not been realised. Instead, children are spending eight years in school and leaving still unable to read and write. This is indeed a waste of government and family resources, including the children's and teachers' time. Similarly, further evidence suggests that several children are either not enrolling in pre-primary classes or are enrolling later, i.e., not at the required age of 5-6 years. For example, the data suggest that, in 2012, the population of children aged 5-6 was 2,755,525 but only 977,533 were enrolled in public and private primary schools, making the net enrolment ratio (NER) 35.5%, while the gross enrolment ratio (GER) was only 37.7% (URT - United Republic of Tanzania, 2014 b p. 6). This evidence suggests that Tanzania is far from realising the goal of universal pre-primary education.

It is worth noting that there are several possible reasons for the poor outcomes of primary school graduates, including the various challenges of managing, running and financing public pre-primary classes. As noted in Komba (2015), the policy documents regarding education financing in Tanzania fail to describe how pre-primary education is and should be financed. For example, the government of Tanzania 2014 Education and Training policy (ETP) states clearly that pre-primary education is compulsory for all children between the ages of three and five for a period of one year (URT, 2014a). However, there is no indication of the mechanism for financing these public pre-primary classes. This suggests that the government has not streamlined the mechanisms for financing pre-primary schools, as is the case for primary and secondary education. Other challenges include a lack of specific guidelines for implementing the policy, resources and a pre-primary quality assurance board (Lyabwene, 2007). As noted earlier, the pre-primary policy states that all children should be enrolled in pre-school, but there is no indication of the mechanism for financing this level of education.

Regarding the mechanism for financing pre-primary public schools, the literature suggests that, during the period of this study, parental contributions were the key financing mechanism, whereby schools were either fully or partly funded by these contributions (Komba, 2015). The amount that parents were required to pay varied from one school to another and was largely determined by their economic ability and willingness to pay rather than the actual cost of providing pre-primary education (Komba, 2015). As a result, parents were contributing different amounts, ranging from Tshs. 500-15,000 or $0.24-7.08 per month (Komba, 2015). This variation across schools contributed to a wider variation in pre-primary education in terms of the quality and quantity of the physical and human resources. These variations were so wide that, in some areas, pupils were studying outside the classroom or in old dilapidated

classrooms with no chairs, desks, textbooks or other basic teaching and learning facilities, while, in some urban and per-urban areas, the condition of pre-primary classrooms was somewhat better. Indeed, the available evidence suggests that the mechanism for financing pre-primary classes was unreliable, it generated funds that were insufficient to cater for the appropriate costs of pre-primary education and contributed to unequal pre-primary education opportunities between children living in rural and urban areas. It should be noted that the government's failure to finance pre-primary education is not peculiar to Tanzania, as in most developed and developing countries, pre-primary education is not financed as much as primary education (Lyabwene, 2007). The government's tendency to sideline the financing of the foundation level of education may have contributed to the poor outcome in primary and other levels of education.

From the previous discussion, it is obvious that, despite the government's positive commitment to ensuring that all children attend pre-primary classes, it remains unclear how this level of education will be financed. There is also a paucity of information regarding the unit cost of providing pre-primary education in public schools. Hence, this study analysed the unit cost of providing pre-primary education in 25 regions of Tanzania Mainland using the criteria of the number of children aged 5-6 years who are the target group for this level of education and the cost of the various basic items required to provide quality pre-primary education. This paper advocates the need for serious investment in pre-primary education for two years, followed by subsequent years of providing a flat amount of capitation grant. It is anticipated that the paper will inform policy-makers in countries which are yet to streamline the financing of pre-primary education regarding the procedures for calculating the unit cost and the benefits of using this unit to determine the actual cost of financing the basic level of education. More specifically, the study contributes to the Tanzanian government's decisions regarding the amount of money needed to finance pre-primary children per day, month and year. However, the information presented in this paper is limited by three factors: firstly, the calculation of the unit cost for the first and following years is based on the 2012 census data. Secondly, the study assumes that all children were enrolled in public pre-primary schools, which may not be the case, as some children may have been enrolled in private pre-primary schools. Thirdly, the study uses a fixed amount of teachers' salaries for the first and following years, although, in reality, it is obvious that, in the second year of employment, there would have been an increment in the salaries. Thus, the figures worked out in this paper as the cost of pre-primary education are indicative rather than conclusive.

Tanzania's education system

Tanzania's formal education system constitutes two years of pre-primary education, seven years of primary education, four years of junior secondary (O level), two years of senior secondary (Advanced level), and three or more years of tertiary education (URT, 1995). After completing primary education, an individual may attend a vocational training institute, proceed to secondary education or find employment in the informal sector. Similarly, after completing secondary education, an individual may attend a teacher training college or another type of vocational/training college, proceed to advanced level education or find employment in the informal or formal sector. The same applies to advanced secondary education: some individuals go on to university or college, while others find employment in the formal or non-formal sector. While primary education is compulsory and free, pre-primary education, secondary and the other levels of education involve cost sharing. It should be noted here that, in 2014, the government proposed a new education structure in which the education system constitutes one year of pre-primary education, six years of primary education, four years of ordinary secondary education, two years of advanced secondary education and three or more years of tertiary education i.e., 1+6+4+2+3 (URT, 2014a). The official age for enrolment in pre-school is five years; hence children aged 5-15 are expected to attend school (i.e., between pre-primary and ordinary secondary school).

Why should there be public investment in pre-primary education? Perspectives from the literature

The literature regarding the benefits of pre-primary education, which justifies the government's intervention in financing pre-primary education, is well documented. This paper highlights some of the justifications as follows. Firstly, preschool and primary education in Africa has been found to have the highest benefit-cost ratio relative to other levels of education (Psacharopoulos, 2014). From an economic perspective, public investment in pre-primary education has been found to be associated with several benefits that accrue to society beyond those captured by the individual child and family (Barnett & Nore, 2011). These include providing an opportunity for children's behaviour to be shaped through interacting with children from better behaved families; reducing inequality due to allowing children from economically disadvantaged families to consume pre-primary education in the same manner as those from economically better off families; increasing the likelihood of high school graduation and reducing crime; reducing the achievement gap between richer and poorer children; containing a health/nutrition element and affecting lifetime earnings through better health; and reducing grade repetition while increasing cognitive skills and adult earnings (Barnett & Nore, 201; Psacharopoulos, 2014). Hence, this evidence suggests that investment in pre-school education yields higher social and economic returns, which justifies the government's financing of this level of education.

Secondly, the government's financing of pre-primary education enhances equal access to this level of education (Zymelman, 1973). This is very important, especially in Tanzania, where the data indicate low enrolment in government and non-government pre-primary schools,

suggesting that some children do not enrol while others do so but not at the appropriate age of five to six. The 2013 data show that the GIR (gross intake ratio) and NIR (net intake ratio) in Tanzanian pre-primary education was 43% and 23%, respectively (URT, 2014b). One reason for this non-enrolment is parents' inability to cover the costs of pre-primary education. It is anticipated that government financing may result in the provision of free, national and quality pre-education, hence extending access to the rural population and children from low-income families. Consequently, quality pre-primary education may mean positive returns in terms of the acquisition of literacy and numeracy skills by the majority of children graduating from pre-primary school. Indeed, the literature shows that the quality of and returns from pre-primary education encourage children's participation in education (Palomba & Vodapivec, 2001). In a similar vein, the literature further maintains that good quality, early childhood education enhances children's readiness for school (Ethiopia policy brief, 2013). Hence, government financing may help the country to achieve the goal of compulsory pre-primary education, which hitherto has remained unfulfilled. Regarding equal access to education, it is also important to reiterate that, currently, the mode of financing pre-primary education in Tanzania has resulted in wide variations in terms of the quality and quantity of pre-primary learning resources in schools across the nation. It is argued that government financing may help to balance the quality and quantity of learning resources, thereby ensuring equal access to education by children from different regions of Tanzania.

Thirdly, government financing of pre-primary education may help to enhance the equality of social opportunities and equity by ensuring fairness and justice in the distribution of government resources to people with varying economic statuses (Zymelman, 1973). Hence, government financing may help to break the cycle of poverty and ensure that children from low-income families can freely access pre-primary education. Hence, children's enrolment in pre-school contributes to poverty reduction, although it should be understood that pre-primary education alone cannot reduce poverty, but rather it is a stepping stone to other levels of education which play an important role in reducing poverty at the level of both the family and the community. Although no data are available, experience suggests that the majority of children who are not enrolled in pre-primary school and those who graduate from primary school without acquiring basic literacy and numeracy skills come from low income families. Hence, government financing may help to ensure that family income is not a determinant of children's learning outcomes.

Fourthly, the literature identified several long-term benefits that may accrue from public investment in pre-primary education. These include lowering the cost of remedial education and grade repetition, increasing the likelihood of pupils completing school, and improving early enrolment in formal primary education (Calman & Tarr-Whelan, 2005, Ethiopia policy brief, 2013). Hence, this means that achieving universal primary education is largely determined by ensuring that all children are enrolled in pre-primary school. This can only be achieved by government intervention in financing pre-primary education.

Lastly, the other benefits of investing in pre-primary education include providing opportunities for children to acquire the concepts, skills and attitudes that lay the foundation for lifelong learning (Ethiopia policy brief, 2013). Pre-primary education has been found to stimulate cognitive and non-cognitive skills in early life which are critical for long-term development. This evidence suggests that children who do not attend pre-primary school are denied the right to an environment that will enable them to acquire the various skills which will lay the foundation for their later learning. The various benefits of investing in pre-primary education suggest that this level of education should be financed by the government. Arguably, investment in education is likely to be better at the early stage of development than in later years, because young children's cognitive ability and behaviour are more malleable than those of adults (Ethiopian policy brief, 2013 pp 2). This argument suggests that it is better to invest in early childhood education than in other levels of education. The literature further maintains that it is more efficient and equitable to invest in education at a very early stage and that intervening later is likely to be less successful since the poorest children are likely to be further behind, which may result in inequity and inefficiency (Ethiopian policy brief, 2013).

Determination of unit costs

In the context of this study, a unit cost is defined as the average total cost of educating a child for a period of one year in a public pre-primary school. This has been calculated by summing up the pre-primary direct, indirect and administrative costs and dividing the sum of these costs by the number of targeted children required to enrol in pre-primary classes, i.e., the population of children aged 5-6 years. This paper established the unit cost of providing pre-primary education as per the pre-primary school requirements stated in the 2007 Tanzania pre-primary curriculum (TIE - Tanzania Institute of Education, 2007). This curriculum states that children are required to study six subjects, which are Kiswahili learning activities, English learning activities, mathematics learning activities, science learning activities, arts learning activities and sports. Hence, it is expected that children will study six subjects, implying six books per pupil, giving a book ratio of 1:2 (TIE, 2007). Regarding human resources, the pre-primary curriculum indicates that each class is required to have two teachers, i.e., a pre-primary teacher and an assistant pre-primary teacher, who are required to be form four graduates with a diploma or certificate in early childhood education. The pre-primary curriculum clearly indicates that the required pupil-teacher ratio is 1:25, while the minimum classroom size is 6.0 x 8.0M, with teaching and learning facilities including pupils' desks (TIE, 2007). The study estimated the cost of a chair and table (each table accommodating three pupils). Further estimates of the cost of other teaching and learning facilities, including the cost of purchasing manila sheets, pencils, exercise books, diaries and games, and providing breakfast. Regarding breakfast, the paper estimated the cost of constructing a kitchen at each school. Conceptualisation of the pre-primary unit costs in this study is indicated in the following figure:

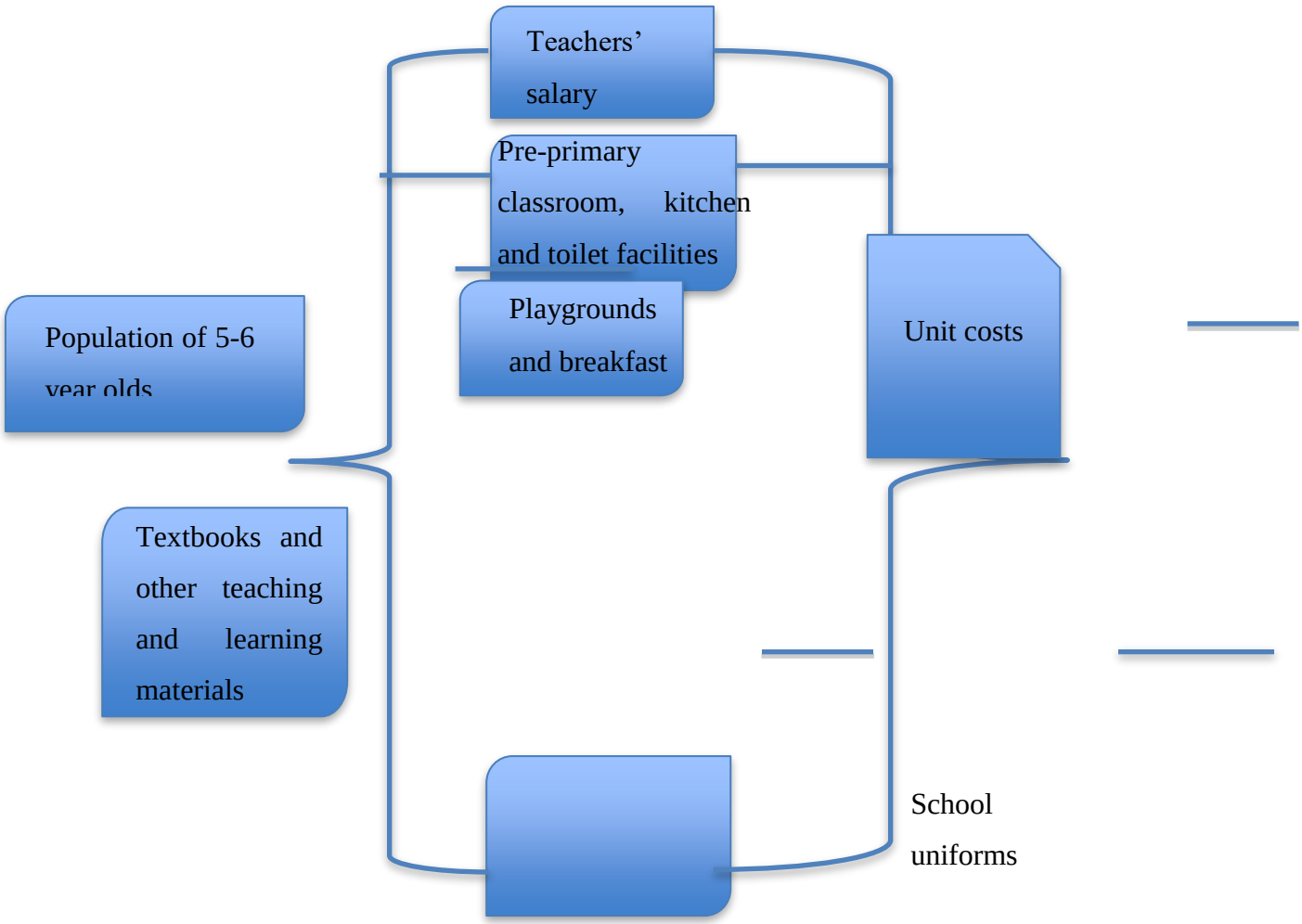

Figure 1: Conceptualisation of the Pre-primary Costs in Tanzania

Figure one indicates the key aspects used to calculate the unit costs of public pre-primary schools in Tanzania. It is expected that the population of 5-6 year olds will determine the amount to be spent on pre-primary education. The study anticipates that each school will build one playground, one pre-primary classroom, one kitchen and one toilet building with basic sanitary facilities. Given the current situation, whereby there are no specialised teachers at this level of education, this paper anticipates hiring a sufficient number of pre-primary teachers throughout the country. Hence, figure one shows that the unit cost of providing pre-primary education in Tanzania is obtained by totalling the basic costs of providing pre-primary education and dividing the total by the total population of 5-6 year olds. The formula used to calculate the unit costs was adapted from the unit cost, as indicated below:

$$\text{Unit costs} = \frac{\sum \text{pre-primary total costs}}{\text{Total output}}$$

Total outputs refer to the population of children aged 5-6.

Methodology

The study used the qualitative research methodology, employing a basic/generic research design (Merriam, 1998). The data collection tools used were documents, observation, and telephone and face-to-face interviews. The key data collection tool was documents which provided information regarding the population of children aged 5-6 in the 25 regions of Tanzania, the pre-primary GIR and NIR, pre-primary teachers' salary rate, and the cost of constructing a classroom, kitchen, playground and sanitary facilities. The supplementary data collection tools were observation and interviews. Telephone and face-to-face interviews were conducted with 260 pre-primary schoolteachers and 260 head teachers of primary schools located in Dar es Salaam and Pwani. The schools in these two regions were selected in such a way that all their educational districts were represented. The districts are: Temeke rural (R), Temeke Urban (U). Ilala (R), Ilala (U), Kindondoni (R), Kinondoni (U), Bagamoyo, Kisarawe, Rufiji, Kibaha, Kibaha, Mafia and Mkuranga. Hence in each district, stratified sampling was used to get a sample of 10 rural and 10 urban schools.

Interviews provided information regarding the current pre-primary education provided in the studied schools and data regarding the cost of the various items needed for the provision of pre-primary education. Observation provided accurate information regarding the current situation in the pre-primary classrooms and their associated facilities. The two regions and their respective districts were selected using convenience sampling, since the regions were conveniently accessible to the researcher at the time of this study. To overcome the shortcomings of convenience sampling and enhance the trustworthiness of the data, the researcher used several strategies, including the triangulation method, whereby similar data were collected from different data collection sources. Other strategies involved the respondents' validation and the use of Kiswahili to collect the data.

The data regarding the unit costs were analysed using the Excel program, whereby the total costs of the basic items required to provide pre-primary education were calculated and finally the unit cost of providing pre-primary education in the 25 regions of Tanzania mainland and the average pre-primary unit cost were established. Data collected using observation, interviews and documents were analysed using content analysis. The data for this study were collected between April and August 2014.

Findings and Discussion

The findings present an analysis of the cost of human resources, textbooks, classrooms, kitchens, playgrounds, sanitary facilities, chairs, tables, school uniforms, other teaching and learning facilities, and breakfasts.

The human resources expenses

The data collected from the interviews and observation in the 260 primary schools revealed that, during the period of the study, very few teachers were specialised in teaching pre-primary classes. Hence, in the various schools, pupils were either taught by form four and class seven graduates or primary school teachers with no specialisation in early childhood education. It was further revealed that, in several schools, the head teacher preferred to employ retired teachers who had never specialised in pre-primary education. This suggests that, with regard to pre-primary education, the main source of teacher recruitment is former employees. See the following quotations:

The school has 78 pre-primary pupils, and there is only one teacher. This is a retired teacher who used to work here as a primary school teacher. She holds a grade A certificate in teacher education and hence she is not a specialised teacher for a pre-primary class (interview, head teacher).

Our school has a total of 124 pupils in the pre-primary class but there is only one teacher. The teacher is a form four holder and has a grade A certificate. Hence, she is not a professional teacher for a pre-primary class (interview, head teacher).

I used to work as a primary school teacher, I retired in 2010. Since the school had no teacher for this class, the head teacher and parents asked me to take this job. I agreed and I am paid by the parents, so my salary varies from month to month, depending on what the parents pay that particular month (interview, pre-primary school teacher).

It was further observed that, in the majority of the schools visited, the teachers were female, suggesting that pre-primary school teaching is a career which attracts more females than males.

To ensure the quality of pre-primary education, this paper proposes that there is a need to train and employ teachers who have specialised in early childhood education. Using the existing census data on the pupil-teacher ratio in pre-primary classes as per the TIE (2007) curriculum, the findings show that the government needs to employ 54,943 pre-primary school teachers with a diploma in pre-primary education. According to the 2015 government's salary structure, which determines employees' salary according to the level of education, a diploma-holding pre-primary teacher's salary is Tshs. 810,000 per month. Hence, this amount has been used to calculate the unit costs (see Table 1 below).

Table 1: The Human Resources Required and Salary Expenses

Regions	Population of five-year olds	Number of teachers required for a pupil-teacher ratio of 1:25	Salary per teacher (Tshs.)	Salary for all teachers in a region (TShs.)
Arusha	50,557	2,022	810,000	1,638,046,800
Dar es salaam	97,100	3,884	810,000	3,146,040,000
Dodoma	70,100	2,804	810,000	2,271,240,000
Geita	62,516	2,501	810,000	2,025,518,400
Iringa	27,573	1,103	810,000	893,365,200
Kagera	76,545	3,062	810,000	2,480,058,000
Katavi	20,809	8,32	810,000	674,211,600
Kigoma	73,478	2,939	810,000	2,380,687,200
Kilimanjaro	39,700	1,588	810,000	1,286,280,000
Lindi	24,165	967	810,000	782,946,000
Manyara	49,976	1,999	810,000	1,619, 222,400
Mara	63,601	2,544	810,000	2,060,672,400
Mbeya	81,991	3,280	810,000	2,656,508,400
Morogoro	66,680	2,667	810,000	2,160,432,000
Mtwara	32,455	1,298	810,000	1,051,542,000
Mwanza	93,274	3,731	810,000	3,022,077,600
Njombe	20,421	817	810,000	661,640,400
Pwani	31,503	1,260	810,000	1,020,697,200
Rukwa	37,976	1,519	810,000	1,230, 422,400
Ruvuma	44,017	1,761	810,000	1,426,150,800
Shinyanga	54,199	2,168	810,000	1,756,047,600
Simiyu	59,401	2,376	810,000	1,924 592 400
Singida	47,911	1,916	810,000	1,552,316,400
Tabora	83,077	3,323	810,000	2,691,694,800
Tanga	64,555	2,582	810,000	2,091,582,000
Total	**1,373,580**	**54,943**		**44,503,992,000**

Sources: Various (Government reports; Basic Statistics in Education; regional reports)

The data show that Lindi and Njombe regions need to hire few teachers, meaning that they have a smaller population of 5-6 year-old children, while Tabora, Kagera, Mbeya and Dar es Salaam need to hire more than 3000 pre-primary teachers. The estimations shown in table one remain the same for the first and following year of implementing pre-primary education.

Textbook expenses

The cost of textbooks was analysed on the basis of the proposed pupil-teacher ratio of 1:2 and the six subjects indicated in the pre-primary curriculum (TIE 2007): Kiswahili learning activities,

English learning activities, science learning activities, mathematics learning activities, vocational skills learning activities, religion, sports and personality learning activities. The findings are indicated in Table 2.

Table 2: Textbook Expenses

Regions	Population of five year-olds	Number of textbooks required for a ratio of 1:2	Total number of textbooks for six subjects	Price per book (Tshs.)	Cost of six books (Tshs.)	Total cost of six books (Tshs.)
Arusha	50,557	25,279	151,671	4,000	24,000	3,640,104,000
Dar es Salaam	97,100	48,550	291,300	4,000	24,000	6 991,200, 000
Dodoma	70,100	35,050	210,300	4,000	24,000	5,047,200,000
Geita	62,516	31,258	187,548	4,000	24,000	4,501,152,000
Iringa	27,573	13,787	82,719	4,000	24,000	1,985,256,000
Kagera	76,545	38,273	229,635	4,000	24,000	5,511,240,000
Katavi	20,809	10,405	62,427	4,000	24,000	1,498,248,000
Kigoma	73,478	36,739	220,434	4,000	24,000	5,290,416,000
Kilimanjaro	39,700	19,850	119,100	4,000	24,000	2,858,400,000
Lindi	24,165	12,083	72,495	4,000	24,000	1,739,880,000
Manyara	49,976	24,988	149,928	4,000	24,000	3,598,272,000
Mara	63,601	31,801	190,803	4,000	24,000	4,579,272,000
Mbeya	81,991	40,996	245,973	4,000	24,000	5,903,352,000
Morogoro	66,680	33,340	200,040	4,000	24,000	4,800,960,000
Mtwara	32,455	16,228	97,365	4,000	24,000	2,336,760,000
Mwanza	93,274	46,637	279,822	4,000	24,000	6,715,728,000
Njombe	20,421	10,211	61,263	4,000	24,000	1,470,312,000
Pwani	31,503	15,752	94,509	4,000	24,000	2,268,216,000
Rukwa	37,976	18,988	113,928	4,000	24,000	2,734,272,000
Ruvuma	44,017	22,009	132,051	4,000	24,000	3,169,224,000
Shinyanga	54,199	27,100	162,597	4,000	24,000	3,902,328,000
Simiyu	59,401	29,701	178,203	4,000	24,000	4,276,872,000
Singida	47,911	23,956	143,733	4,000	24,000	3,449,592,000
Tabora	83,077	41,539	249,231	4,000	24,000	5,981,544,000
Tanga	64,555	32,278	193,665	4,000	24,000	4,647,960,000
Total	**1,373,580**	**686,790**	**4,120,740**			**98,897,760,000**

Source: As in Table 1.

As indicated in the above table, some regions, Katavi, Lindi, Mtwara, and Njombe, need less than 20,000 books while other regions, such as Dar es Salaam, Mwanza and Tabora, will require more than 40,000 books. The literature maintains that the proper use of textbooks plays an important role in the teaching and learning process. Books provide a useful resource for both

teachers and learners and serve several purposes, including, providing a road map for students by informing them about what to expect and what is expected of them, providing a set of visuals, and reading and counting activities, thereby saving the teacher's time in finding or developing such materials, and giving teachers a basis for assessing students' learning (Gak, 2011). Given their importance, it is argued that pupils should be provided with textbooks and hence these will need to be purchased annually. The estimated cost of books remains the same for the first and second year of implementing the programme.

Classrooms, kitchens, playgrounds and sanitary facilities costs

The data collected from observation indicate that the pre-primary classrooms in the majority of the schools were dilapidated as they had no kitchen, playground or toilet facilities for the children. Hence, it is vital to construct a new classroom, kitchen, toilet facility and playground in each school. The study uses data regarding the total number of primary schools in Tanzania (URT, 2014b), which indicate that, in total, the country has 14,154 primary schools. Hence, this suggests that, in total, the country will need to construct 14,154 classrooms, 14,154 kitchens, 14,154, toilet buildings and 14,154 playgrounds. An estimation of the classroom construction costs was obtained using the government's estimates of $5,000 per classroom, as stated in the Primary Education Development Programme (URT, 2006). The data suggest that the estimated cost of a playground, kitchen and toilet building is Tshs. 4,000,000. It is anticipated that these costs will be incurred during the first year of implementing the programme and that, in subsequent years, the costs will only involve repairs. Hence, the cost of constructing these four facilities has been omitted in the following year of the programme's implementation (see Table 3).

Table 3: Costs related to Constructing Classrooms, Kitchens, Playgrounds and Toilets

Regions	Number of classrooms, kitchens, playgrounds and toilet buildings required	Total cost of classroom construction	Total cost of kitchen construction	Total cost of playground construction	Total cost of toilet buildings construction
Arusha	485	4,850,000,000	1,940,000,000	1,940,000,000	1,940,000,000
Dar es Salaam	431	4,310,000,000	1,724,000,000	1,724,000,000	1,724,000,000
Dodoma	747	7,470,000,000	2,988 000,000	2,988, 000,000	2,988,000,000
Geita	355	3,550,000,000	1,420,000,000	1 420 000,000	1,420,000,000
Iringa	257	2,570,000,000	1,028,000,000	1,028 ,000 000	128,000,000
Kagera	896	8,960,000,000	3,584,000,000	384,000,000	3,584, 00,000
Katavi	125	125, 000,000	500, 000,000	500,000,000	500,000,000
Kigoma	456	4,560,000,000	1,824,000,000	124,000,000	1,824,000,000
Kilimanjaro	917	9,170,000,000	3,668,000,000	3,668,000,000	3,668,000,000
Lindi	374	3,740,000,000	1,496,000,000	1,496,000,000	1,496,000,000
Manyara	595	5,950,000,000	2,380,000,000	2,380,000,000	2,380,000,000

Mara	628	6,280,000,000	2,512,000,000	2,512,000,000	2,512,000,000
Mbeya	977	9,770,000,000	3,908,000,000	3 908 000,000	3,908,000,000
Morogoro	854	8,540,000,000	3,416,000,000	3,416,000,000	3,416,000,000
Mtwara	636	636,000,000	2,544,000,000	2,544,000,000	2,544,000,000
Mwanza	763	7,630,000,000	3,052,000,000	3,052,000,000	3,052,000,000
Njombe	448	4,480,000,000	1,792,000,000	1,792,000,000	1,792,000,000
Pwani	418	4,180,000,000	1,672,000,000	1,672,000,000	1,672,000,000
Rukwa	159	1,590 000,000	636,000,000	636,000,000	636,000,000
Ruvuma	533	5,330,000,000	2,132,000 000	2,132,000,000	2,132,000,000
Shinyanga	442	4,420,000,000	1,768,000,000	1,768,000,000	1,768,000,000
Simiyu	515	5,150,000,000	2,060,000,000	2,060,000,000	2,060,000,000
Singida	515	5,150,000,000	2,060,000,000	2,060,000,000	2,060,000,000
Tabora	679	6,790,000,000	2,716,000,000	2,716,000,000	2,716,000,000
Tanga	949	6,790,000,000	3,796,000,000	3,796,000,000	3,796,000,000
Total	**14,154**	**1.3884E+11**	**5,616,000,000**	**56,616,000,000**	**52,820,000,000**

It is expected that the availability of a kitchen will provide an opportunity for the children to have breakfast. On the other hand, it was revealed, during the period of this study, that the pre-primary children were sharing toilet facilities with older primary school pupils. Unfortunately, in several schools visited, even the toilets for older children were insufficient and dilapidated and hence too unhygienic to be used by young children. Hence, it is strongly recommended that schools should consider providing special toilet facilities for pre-primary pupils. The observation of playgrounds and interviews with pre-primary teachers indicate that these were largely lacking in the majority of the schools and, in practice, were not regarded as essential for pre-primary pupils' learning. Yet, the literature and evidence from research indicate that there is a link between play and brain development, motor skills, and cognitive, emotional, physical, and social development (Shasta Children and Families First Commission–SCFFC 2001). From the literature, school playgrounds serve several purposes, including promoting brain development, laying the foundation for a successful mind through repetitive play, promoting physical success by allowing children to explore, test and expand the limits of the growing body and promoting social, intellectual, and oral skills by allowing children to interact with their peers and the environment (SCFFC, 2001). The evidence from the literature indicates that playground facilitates accelerate all aspects of learning i.e., emotional, social, motor and cognitive. It is therefore argued that the lack of a playground denies children the opportunity to develop their brain, body and intellect. In this regard, it is emphasised that each school needs to have a playground offering various types of play.

Chairs and tables costs

The calculations involve estimating the cost of chairs and tables for pre-primary pupils, with three children per table. Hence, according to the 2012 census data, 1,373,580 chairs will need to

be constructed, each costing Tshs. 50,000, and 441,008 tables, each costing Tshs. 70,000. The total cost of the chairs and tables per region is indicated in Table 4. It is anticipated that these costs will be incurred during the first year of implementing the programme. Since the proposed quality of the chairs and tables is high, it is anticipated that these will not need repairing for several years. Hence, the cost of the chairs and tables was omitted in the second year of implementing the programme (see Table 4).

Table 4: Chairs and Tables Costs

Regions	Population of five year-olds	Number of chairs required	Cost per chair	Total cost of all chairs	Number of tables required	Price per table	Total cost of all tables
Arusha	50,557	50,557	50,000	2,527,850,000	16,852	70,000	1,179,663,333
Dar es Salaam	97,100	97,100	50,000	4,855,000,000	32,367	70,000	2,265,666,667
Dodoma	70,100	70,100	50,000	3,505,000,000	23,367	70,000	1,635,666,667
Geita	62,516	62,516	50,000	3,125,800,000	20,839	70,000	1,458,706,667
Iringa	27,573	27,573	50,000	1,378,650,000	9,191	70,000	643,370,000
Kagera	76,545	76,545	50,000	3,827,250,000	25,515	70,000	1,786,050,000
Katavi	20,809	20,809	50,000	1,040,450,000	6,936	70,000	485,543,333
Kigoma	73,478	73,478	50,000	3,673,900,000	24,493	70,000	1,714,486,667
Kilimanjaro	39,700	39,700	50,000	185,000,000	13,233	70,000	926,333,333
Lindi	24,165	24,165	50,000	1,208,250,000	8,055	70,000	563,850,000
Manyara	49,976	49,976	50,000	2,498,800,000	16,659	70,000	1,166,106,667
Mara	63,601	63,601	50,000	3,180,050,000	21,200	70,000	1,484,023,333
Mbeya	81,991	81,991	50,000	4,099,550,000	27,330	70,000	1,913,123,333
Morogoro	66,680	66,680	50,000	3,334,000,000	22,227	70,000	1,555,866,667
Mtwara	32,455	32,455	50,000	1,622,750,000	10,818	70,000	757,283,333
Mwanza	93,274	93,274	50,000	4,663,700,000	31,091	70,000	2,176,393,333
Njombe	20,421	20,421	50,000	1,021,050,000	6,807	70,000	476,490,000
Pwani	31,503	31,503	50,000	1 575 150 000	10,501	70,000	735,070,000
Rukwa	37,976	37,976	50,000	1,898,800,000	12,659	70,000	886,106,666
Ruvuma	44,017	44,017	50,000	2,200,850,000	14,672	70,000	1,027,063,333
Shinyanga	54,199	54,199	50,000	2,709,950,000	18,066	70,000	1,264,643,333
Simiyu	59,401	59,401	50,000	2,970,050,000	19,800	70,000	1,386,023,333
Singida	47,911	47,911	50,000	2,395,550,000	15,970	70,000	1,117,923,333
Tabora	83,077	83,077	50,000	4,153,850,000	27,692	70,000	1,938,463,333
Tanga	64,555	64,555	50,000	3,227,750,000	21,518	70,000	1,506,283,333
Total	**1,373,580**	**1,373,580**		**68,679,000 000**	**441,008**		**32,050,200,000**

The findings from observation and the interviews indicate that several schools used desks specifically designed for use by primary school pupils. It was observed that the desks used in several pre-primary schools were too large for the age and height of pre-primary pupils. Hence,

the teachers noted that children needed to stand in order to use the top part of the desks for writing. It was also revealed that, in several schools, there were no desks and hence the children had to sit on the floor. The following issues were revealed:

The school has no tables and chairs specifically designed for pre-primary pupils. We are using desks intended for older children who are in primary school. With these desks, it is impossible for the children to sit comfortably and write, since the distance between the top of the desk and the part where the pupils are required to sit is too wide. As a result, pre-primary pupils have to stand up in order to write (interview, pre-primary teacher).

The school has insufficient desks. I asked the parents to contribute so that we could buy desks but this has not been possible. Hence, the children sit on the ground (interview, pre-primary teacher).

It was revealed that the lack of desks and other facilities were among the reasons that discouraged children from attending school. Hence, in this paper, it is argued that it is vital to ensure that all children in school have access to desks or chairs that are appropriate for their age.

School uniforms and other teaching and learning facilities

The issue of school uniforms is very controversial among parents, students and educators. Yet, it is argued that school uniforms serve several roles, including enhancing the school's and pupils' safety while at school and on their way to and from school, creating equality among children from families of different social economic statuses, reducing clothing expenses and creating a strong school ethos and a sense of belonging to the school (Draa, 2005). In Tanzania, pupils are required to wear a school uniform, comprising shorts/skirts, shirts/blouses, shoes, socks and school bags. The school uniform in Tanzania is an indirect cost which is supposed to be incurred by the parents. The findings from the field indicate that a school uniform costs Tshs. 50,000 per child.

The other teaching and learning materials comprise children's games, manila cards, stationery, chalk and dusters. The estimation of all of these facilities is Tshs. 50,000 per child. The cost of school uniforms and teaching and learning facilities needs to be provided annually. Hence, this was included in the second year of implementing the project.

Breakfast

Breakfast is a key aspect in encouraging children to attend school. Breakfast is vital in school, especially since these children are too young to survive for five hours without eating. From the field it was noted that some schools provide porridge for breakfast, but not all of them. In the schools which do, the pupils can buy a cup of porridge for Tshs. 100, although in the majority of primary schools this porridge is prepared away from the school premises and hence hygiene is not assured. Hence, this study suggests that it is necessary to construct a kitchen in each school.

Similarly, to manage the provision of breakfast properly and reduce the cost of hiring a cook, this paper proposes the use of the method currently employed in certain schools which provide breakfast with some modifications. It is proposed that the kitchen is outsourced to a private, trustworthy food vender who will cook and serve the porridge at a cost of Tshs. 100 per cup. This entails privatization of the kitchen and the food vender will pay rent to the school, which will serve as a source of income. It is also worth noting that the cost of breakfast is indirectly incurred by the parents. The estimation involves calculating the amount per pupil for the 194 school days per year and the total number of pupils. The estimation of the cost of breakfast is indicated in Table 5:

Table 5: Breakfast Costs

Regions	Population of five year-olds	Breakfast per pupil	Breakfast per child for 194 school days	Total cost of breakfast for all children
Arusha	50,557	100	19,400	980,805,800
Dar es salaam	97,100	100	19,400	1 883,740,000
Dodoma	70,100	100	19,400	1,359,940,000
Geita	62,516	100	19,400	1,212,810,400
Iringa	27,573	100	19,400	534,916,200
Kagera	76,545	100	19,400	1,484,973,000
Katavi	20,809	100	19,400	403,694,600
Kigoma	73,478	100	19,400	1,425,473,200
Kilimanjaro	39,700	100	19,400	770,180,000
Lindi	24,165	100	19,400	468,801,000
Manyara	49,976	100	19,400	969,534,400
Mara	63,601	100	19,400	1,233,859,400
Mbeya	81,991	100	19,400	1,590,625,400
Morogoro	66,680	100	19,400	1,293,592,000
Mtwara	32,455	100	19,400	629,627,000
Mwanza	93,274	100	19,400	1,809,515,600
Njombe	20,421	100	19,400	396,167,400
Pwani	31,503	100	19,400	611,158,200
Rukwa	37,976	100	19,400	736,734,400
Ruvuma	44,017	100	19,400	853,929,800
Shinyanga	54,199	100	19,400	1,051,460,600
Simiyu	59,401	100	19,400	1,152,379,400
Singida	47,911	100	19,400	929,473,400
Tabora	83,077	100	19,400	1,611,693,800
Tanga	64,555	100	19,400	1,252,367,000
Total	**1,373,580**			**26,647,452,000**

Total unit costs

Having calculated the cost of all of the basic items, the unit cost was calculated. As noted above, this involves totalling all of the costs and dividing the result by the total number of outputs, i.e., pupils. The findings for the pre-primary unit costs per region for the first and second year of implementing the programme are indicated in Table 6.

Table 6: Unit Costs for Public Pre-Primary Education in the First and Following Year of Implementing the Programme

Regions	Total costs (first year of the programme)	Unit cost (first year of the programme)	Total costs (the following year)	Unit costs (the following year)
Arusha	25,692,169,933	508,82	11,314,656,600	223,800
Dar es Salaam	38,333,646,667	394,785	21,730,980,000	223,800
Dodoma	37,263,046,667	531,570	15,688,380,000	223,800
Geita	26,385,587,467	422,061	13,991,080,800	223,800
Iringa	13,846,857,400	502,189	6,170,837,400	223,800
Kagera	42,456,071,000	554,655	17,130,771,000	223,800
Katavi	8,933,047,533	429,288	4,657,054,200	223,800
Kigoma	31,864,763,067	433,664	16,444,376,400	223,800
Kilimanjaro	31,970,193,333	805,295	8,884,860,000	223,800
Lindi	15,408,227,000	637,626	5,408,127,000	223,800
Manyara	27,939,535,467	559,059	11,184,628,800	223,800
Mara	32,713,977,133	514,363	14,233,903,800	223,800
Mbeya	45,856,259,133	559,284	18,349,585,800	223,800
Morogoro	38,600,850,667	578,897	14,922,984,000	223,800
Mtwara	23,635,462,333	728,253	7,263,429,000	223,800
Mwanza	44,500,814,533	477,098	20,874,721,200	223,800
Njombe	15,923,759,800	779,774	4,570,219,800	223,800
Pwani	18,556,591,400	589,042	7,050,371,400	223,800
Rukwa	14,781,935,467	389,244	8,499,028,800	223,800
Ruvuma	24 804 917,933	563,530	9,851,004,600	223,800
Shinyanga	25,828,329,533	476,546	12,129,736,200	223,800
Simiyu	28,980,017,133	487,871	13,293,943,800	223,800
Singida	25,565,955,133	533,613	10,722,481,800	223,800
Tabora	39,622,945,933	476,942	18,592,632,600	223,800
Tanga	37,359,442,333	578,723	14,447,409,000	223,800
Total unit cost	**710,500,554,000**	**517,262**	**304,879,354,000**	**221,960**

The data indicate that the unit cost is high in regions with fewer outputs than in those with a large number of outputs. For the first year of implementing the programme, the unit cost ranges from Tshs. 422,061 to 805,295, while, for the following year, the unit cost is Tshs. 223,800 for all regions. These data are further summarised in Figure 1.

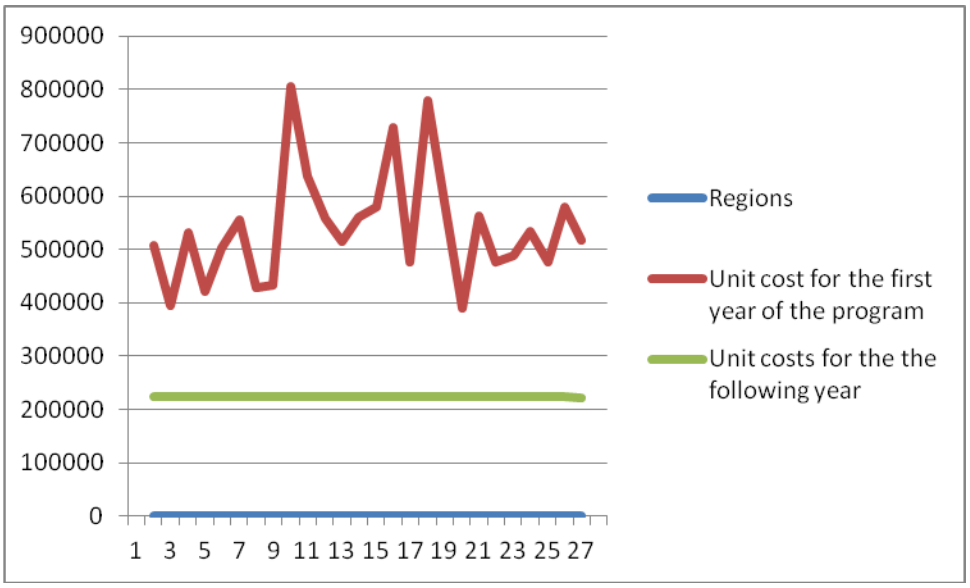

Figure 2: Unit Costs for Public Pre-Primary Education in the First and Following Year of Implementing the Programme

Figure 1 clearly indicates that the costs will be high in the first year of implementing the programme. The reason, as highlighted earlier, is that the second year does not involve estimations for constructing classrooms, playgrounds, kitchens and toilet facilities. Hence, the findings suggest that revamping pre-primary education will require a serious one-year investment by the government and that the costs will decline in the subsequent year.

Conclusions and Recommendations

Now that the government of Tanzania intends to improve literacy and numeracy in the early grades, this paper recommends revamping pre-primary education by constructing new classrooms and providing all the required resources, including hiring qualified teachers. Based on the findings, it recommends that pre-primary pupils should be provided with a capitation and development grant of $25 a month during the first year of programme implementation and $10 a month in the following years. To minimise the burden on the government, it is proposed that the construction of classrooms, sanitary facilities, kitchens and playgrounds should be mobilised at the level of district councils. The government may encourage the district councils to ensure that all primary schools possess the proposed pre-primary facilities. It is recommended that pre-primary education should be revamped following a model similar to that applied to secondary schools and science laboratories in Tanzania. It is also recommended that pre-primary education should be provided for free and that parents should only bear the indirect costs of their children's education, i.e., those relating to uniforms and breakfast. Similarly, there is a need to educate parents on the importance of pre-primary education so that all targeted children will attend pre-primary school.

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