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TUSOME AND PRIMR: A DESK REVIEW OF EARLY GRADE READING PROGRAMS IN KENYA FROM 2011-2019

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ACRONYMS

APBET	Alternative Provision of Basic Education and Training
ASAL	Arid and Semi-Arid Lands
CBC	Competency-Based Curriculum
CWPM	Correct Words Per Minute
CEB	County Education Board
CSO	Curriculum Support Officer
DFID	Department for International Development
EMIS	Education Management Information System
EVS	Education Voucher Scheme
EYS	Elimu Yetu Coalition
FPE	Free Primary Education
GDP	Gross Domestic Product
GPE	Global Partnership for Education
GoK	Government of Kenya
GPS	Global Positioning System
ICT	Information and Communications Technology
IP	Implementing Partners
INSET	In-Service Education and Training
KEMI	Kenya Education Management Institute
KICD	Kenya Institute for Curriculum Development
KNEC	Kenya National Examinations Council
MoE	Ministry of Education
M&E	Monitoring and Evaluation
NASMLA	National Assessment System for Monitoring Learner Achievement
NESSP	National Education Sector Strategic Plan
NGO	Non-Governmental Organization
PRIMR	Primary Math and Reading
PTTC	Primary Teacher Training Colleges
RCT	Randomized Controlled Trial
STI	Science, Technology and Innovation
SAGA	Semi-Autonomous Government Agencies
SES	Social Economic Status
TAC	Teacher Advisory Centre
TSC	Teachers Service Commission
TLM	Teaching Learning Material
USAID	U.S. Agency for International Development

EXECUTIVE SUMMARY

Reading is a fundamental skill which is linked to future academic success and life outcomes. Early grade reading scores in many low- and middle-income contexts are significantly lower than in high-income countries. Children who do not learn to read in the first few grades of school have higher likelihoods of repeating classes or dropping out of school compared to their literate peers.

Kenya has had a number of reforms in the education sector. For example, in 2003, the Government of Kenya implemented Free Primary Education, which drastically increased pupil enrollment, with near gender parity. However, the quality of education provided in many public primary schools began to decline. The core skills of literacy and numeracy degenerated the most due, in part, to increased enrollment numbers that were not accompanied by an increase in supportive services and resources. The lack of supportive services and resources was especially felt after the 2007/8 election violence, as most of the infrastructure was destroyed and funding allocation to the education sector reduced. With donor support in subsequent years, the Ministry of Education started to improve school infrastructure, including providing electricity in schools and building of computer rooms. The U.S. Agency for International Development funded Tusome (2014-2019), a successful early grade reading program, implemented by RTI International.

PURPOSE OF REVIEW

The purpose of this desk review is to provide an analysis of Tusome's successes, the challenges it faced, and the factors that enabled the Kenyan Ministry of Education (MoE) to scale and sustain the program.

THE TUSOME PROGRAM

The Tusome program takes its name from the Kiswahili word for "Let's Read." Tusome is set apart by two major aspects: its strong evidence-based approach drawn from the highly successful precursor initiative, Primary Math and Reading (PRIMR) and, its ability to be implemented at the national scale in a cost-effective way. Tusome focuses on five key interventions that were developed and proven under PRIMR to improve pupils' learning outcomes, namely: 1) Enhancing teachers' capacity to effectively deliver classroom instructions; 2) Improving learners' access and use of appropriate core and supplemental reading instructional materials and resources; 3) Enhancing instructional support and supervision; 4) Integrating the use of information and communications technology (ICT) and data through Curriculum Support Officers' (CSOs') tablets, nationally; and 5) Enhancing collaboration with other literacy actors locally and internationally.

TUSOME PROGRAM SUCCESSSES

Tusome is on course to improve literacy levels for approximately seven million Kenyan children in Grades 1–3 in more than 22,600 public schools, 5,027 private schools, and 1,500 Alternative Provision of Basic Education and Training (APBET) institutions by the end of 2019. This is attributed to a number of factors including the following: conducive policy environments, leverage of government systems, availability of teaching and learning materials with a pupil to textbook ratio of 1:1, use of result-oriented research-based information and communications technology (ICT) methods, teacher training and supervision, economic factors/government buy-in and spending, improved infrastructure such as electricity and school feeding, and learner factors.

TUSOME PROGRAM CHALLENGES AND MITIGATION STRATEGIES

Although Tusome has had a successful implementation, there are some challenges that spilled over from the PRIMR program. The major challenges included capacity gaps at the national level, such as limited monitoring and evaluation (M&E) capacity for the education system, as well as inadequate data on school lists and pupils enrollment within APBET and Special Needs Education (SNE) schools. Other challenges included a lack of functional libraries for both staff and pupils and delayed replacement of retired CSOs, which resulted in a number of school zones not being supported as expected.

There are a number of ways through which the challenges have been mitigated. Direct distribution of textbooks to schools was centralized to mitigate the misuse of capitation funds that were initially sent to schools. Additionally, the Kenya Institute for Curriculum Development (KICD), an agency responsible for learning material development, proposed that essential textbooks for use in literacy (in English and Kiswahili) and numeracy in lower primary be prepared by a group of curriculum specialists under its guidance. KICD also proposed a competitive search for the cheapest source for publication of learning materials. Furthermore, the Tusome program supported the development of the Education Management Information System (EMIS) and demonstrated how MoE would conduct M&E through Dashboard, an online tool that using GPS systems to capture and share M&E activities and data by field officers in real time. Tusome also strengthened collaboration between the MoE departments, Teachers Service Commission (TSC), and other partners in capacity development. It developed a policy framework for capacity development of education managers, continued to design new training activities in response to changes in the education sector, and continued engaging with TSC on CSO replacement.

TUSOME PROGRAM SUSTAINABILITY PLAN

Tusome outlined a sustainability plan where the MoE will assume full responsibility of all activities by January 2020. These activities include the following: development, printing, and distribution of instructional materials; data management on Dashboard; teacher trainings and professional development; on-going classroom support; and mentoring and coaching. RTI International has gradually released responsibilities to MoE, but will continue to provide technical and logistical support to the Ministry, which is now (beginning this year, 2019) starting to lead these activities. There are specific efforts from the Government of Kenya (GoK) under the MoE to sustain and institutionalize Tusome. These efforts include continued training, capacity building, and consistent support of CSOs and the continued training of headteachers on how to provide instructional leadership for their schools while managing the acquisition, proper utilization, and maintenance of the new learning materials. The MoE, through Kenya Institute for Curriculum Development (KICD), incorporated Tusome interventions into the new Competency-Based Curriculum (CBC) for the Early Years Education (Grades 1-3), which was rolled out in all public primary schools in Kenya. The MoE also committed funds to the education sector. Furthermore, the MoE, through KICD, revised Tusome materials to ensure that they are CBC compliant, acquired copyright of the materials, and will be publishing the materials henceforth to ensure the success and sustainability of Tusome. At the county level, the MoE and TSC developed and are rolling out joint county work plans that integrate Tusome key activities in all the 47 counties.

1.0 INTRODUCTION AND BACKGROUND

Early grade reading is a fundamental skill linked to future academic success and life outcomes. However, early grade reading scores in many low- and middle-income contexts are significantly lower than in high income countries. Research on early grade reading demonstrates that children who do not learn to read in the first few grades of school have higher likelihoods of repetition or drop-out compared to their peers. Moreover, over time, the learning gap increases between students who can read fluently and with comprehension compared to their peers who cannot read fluently and with comprehension.

The Kenyan MoE works to improve education quality with a focus on basic education and early grade reading. The Kenyan Constitution of 2010 guarantees every child has a right to free and compulsory basic education and Articles 43 (1) (f), 53 (1) (b) and 55 (a) in Chapter 4 of the Constitution obligate both the State and parents to facilitate quality basic education to all children (Constitution, 2010). However, these constitutional changes did not result in quality basic education or improved learning outcomes. In 2013, the National Education Sector Strategic Plan (NESSP) 2013-2018 was developed, with the main goal of providing quality basic education for Kenya's sustainable development (MoE, 2014). The implementation period of NESSP 2013-2018 came to an end in June 2018. The subsequent, partially (70 percent complete) drafted, NESSP (2018-2022) will provide policy direction to both the Science, Technology and Innovation (STI) sector and the Education and Training Sector. NESSP aims to address challenges in promoting equitable access to quality education and training, as well as STI. The draft NESSP incorporates the aspirations of the Third Medium Term Plan (MTP III 2018-2022) of the Kenya Vision 2030, "Big Four Agenda" among other national priorities (MoE, 2018).

This report provides an analysis of the scale-up of the Tusome Early Grade Reading program in Kenya from 2014-2019, the challenges it faced, and factors that have enabled the Kenyan MoE to implement and sustain the program.

1.1 KENYA'S EDUCATION CONTEXT

Prior to the introduction of formal education, indigenous education existed for centuries across Africa. In the mid-19th century, missionaries laid the foundation for formal education in Kenya starting along the coastal areas where they introduced reading as an important mechanism for spreading Christianity. In the early 20th century, schools started to open, but the majority were attended by European and Asian children. Even as formal education continued to grow, colonial education for the Africans was inadequate in both quantity and scope, with narrow and restrictive objectives. The restrictive effect of colonial policy on African education meant that a large majority of school-age children were not going to school. The few that went to school later became the small, educationally-elite group, with many assuming leadership positions after Independence.

In 1963, Kenya obtained her independence from Great Britain and Jomo Kenyatta was elected as the first president. The new government in Kenya emphasized education as critical for national development and immediately embarked on developing policies that would address issues of opportunity, access, and equity. In 1964, the new MoE set up its first national commission to assess the education system, review policy needs, and recommend improvements to the government.

Kenya witnessed several education reforms since gaining independence. These reforms are summarized below (Lelei and Weidman, 2012).

The Ominde Commission (1964): This Commission undertook an exhaustive investigation of all aspects of education. The urgent task was to abolish segregation on the basis of race (African, Arab, Asian, and European) and foster the psychological basis of nationhood, both to promote national unity and to serve as an instrument for conscious change of attitudes. The Commission worked towards the formulation of official and inclusive educational policies to meet the needs of a newly independent nation. The Ominde Commission made significant recommendations aimed at abolishing segregated schools, expanding educational opportunities for African children especially at the secondary and tertiary levels, establishing schools with funds generated by local community members ("harambee schools"), and changing the curriculum to suit the needs of a newly independent nation. The Commission recommended increasing the opportunities for access to the formal sectors of education through establishment of schools with funds generated by local community members.

While the policy of education expansion was in full gear and the country began to witness tremendous increases in the number of secondary schools, the educational development trends were uneven; they favored the parts of the country endowed with resources while marginalizing parts of the country that were hard to reach and had limited resources.

The Gachathi Commission (1976): Due to the numerous problems the education system was experiencing, especially the relevance of education to rural development, the enormous increase in the cost of education since Independence, and the rapidly rising level of unemployment among school graduates, the government appointed the National Committee on Educational Objectives and Policies (the Gachathi Commission, 1976). Three goals were set for this commission; they were to evaluate the system of education, define a new set of educational goals for the second decade of independence, and formulate a specific program of action for achieving the set goals.

The Gachathi Committee identified two key problems with the education system in Kenya: 1) the concentration of most of the economic growth gains within the modern formal sector was accessed by a few people who completed secondary and tertiary levels of formal education, and 2) the objectives, structure, and content of the education system were highly selective with an aim of producing a few individuals who were well-equipped to enter the modern formal sector of the economy.

The Gachathi Report provided three particularly important recommendations: 1) access to seven years of basic education for every child should be regarded as a fundamental right and provided free of charge; 2) public funds should be directed to improving the quality and content of education; and 3) the government should continue to review the curriculum, methods of teaching, and forms of selection for student transition that were being used at the primary and secondary levels, with a goal of making the content of the educational system more relevant to the country's social and economic needs.

Mackay Commission (1981): The Mackay Commission was appointed by President Moi in 1981 primarily to study the country's needs for higher education in relation to the country's objectives for rural development. The following recommendations were provided: 1) restructure Kenya's system of education, moving away from the British structure of seven years of primary, four years of secondary, two years of advanced secondary, and three years of university, to a new structure that resembled a common American pattern, with eight years of primary, four years of secondary,

and four years of college or university (8-4-4 system); 2) restructure the curriculum, putting more emphasis on practical courses and skill acquisition and; 3) require all students at the secondary level to take science and mathematics for graduation.

Kamunge Commission (1988): This commission, dubbed "the Presidential Working Party on Education and Manpower Training for the Next Decade and Beyond," conducted a comprehensive review of national educational philosophy, policies, and objectives to ascertain whether they were in agreement with the changing social, cultural, economic, and political demands in the country. The Commission made the following observations: 1) it was mainly through education, training, and research that the nation would be able to meet the many challenges of socio-economic development and industrialization, utilize modern technology, and enhance the quality of life for all Kenyans; 2) it supported the 8-4-4 system of education, especially its broadly-based, more vocationally-oriented curriculum; 3) it proposed cost-sharing in order to support the new curriculum where its implementation required better physical facilities, teaching and learning materials, and teachers; and 4) it coordinated and harmonized curriculum, examinations, and certification, and ensured effective management and supervision at all levels. The implementation of cost-sharing recommendation had major negative effects on education, especially for the rural poor, resulting in many children dropping out of school and declined enrollment.

Koech Commission (1999): Established in 1999, the Koech Commission was focused on Totally Integrated Quality Education and Training (TIQET). The Commission was mandated to recommend ways and means of enabling the education system to facilitate national unity, mutual social responsibility, accelerated industrial and technological redevelopment, life-long learning, and adaptation in response to Kenya's changing needs in a global environment.

By the time this Commission was constituted, the public perceived that the 8-4-4 education system was not delivering as anticipated. Some of the major complaints included access, quality, equity, and the system's relevance to Kenyans' needs amidst the high levels of unemployment among graduates. The Koech report highlighted issues related to: 1) shifting policies that kept education from attaining national goals, 2) the declining moral fabric of the nation, 3) the declining quality of the vocational education sector, 4) the poor coordination of education services and too much centralization of decision-making, 5) haphazard implementation and monitoring of the 8-4-4 system of education, and 6) poor linkages between educational institutions and industry contributing to its lack of quality and relevance, as well as the slow rate of employment creation.

The Koech Commission saw a need to re-evaluate the goals and objectives of education in the Kenyan context. The existing Education Act was outdated because it neglected crucial areas of education including early childhood care, development and education, education for those with special needs, and the role of parent associations. The country needed to focus on providing the resources needed to build a comprehensive education system that would provide high quality of education for all (Koech, 1999).

The Koech Commission proposed the new TIQET system, replacing previous structures titled according to the numbers of years of education at each level. The commission recommended a new Education Act, new laws, and amendments to other laws related to education. The proposed TIQET system included several significant changes in the structure and organization of Kenyan education including: 1) expanding access to basic education from 8 to 12 years so every Kenyan would have an opportunity to attain secondary education; 2) provision of universal and compulsory basic education thus reducing disparities in education; 3) expansion of opportunities at the post-secondary level so that learners could flexibly pursue further studies; 4) introduction of a modular

or unit learning approach at post-secondary education; 5) expansion of alternative and continuing education; and 6) introduction of manageable curriculum content at all levels of education.

Free Primary Education: In 2003, the GoK implemented Free Primary Education, which saw a drastic increase in pupil enrollment, with near gender parity (Avenstrup et al., 2004). However, the quality of education provided in many public primary schools began to decline with core skills of literacy and numeracy being the hit the hardest. This decline was due, in part, to the increase in enrollment that was not accompanied by an increase in supportive services and resources (Piper and Mugenda, 2013). The lack of supportive services and resources was especially felt after the 2007/2008 election violence, as the majority of school structures were destroyed and the education sector's funding was reduced. It was not until donor support resumed in 2010 that the MoE got the support needed to provide schools with resources, such as electricity and computer rooms. Overall, positive contributions by the government resumed in 2011/2012 as the country was stabilizing from the post-election crisis. Research under Uwezo Kenya¹ Initiative (2016) and the National Assessment System for Monitoring Learner Achievement, NASMLA (2018) further attested to the low levels of literacy skills among early grade learners in Kenya (NESSP, 2019).

1.2 THE PRIMARY MATH AND READING (PRIMR) APPROACH

In 2011, Kenya began implementing the PRIMR project, the precursor to the 5-year Tusome intervention (2014-2019). PRIMR encompassed two separate but interrelated research programs with funding from the U.S. Agency for International Development (USAID) and the Department for International Development (DFID), organized into a set of randomized controlled trials (RCTs) with various intervention groups to determine the most cost-effective means of improving early literacy and numeracy (Piper et al., 2018b). This three-year PRIMR program covered 547 formal public schools and low-cost private schools across Kenya. The low-cost private schools were located in informal settlements in urban centers of Nairobi. They from part of schools now referred to as APBET schools.

PRIMR focused on improving numeracy and reading outcomes in Classes 1 and 2. The program's scope was to apply innovative, evidence-based methods to increase students' fundamental skills in literacy and numeracy. PRIMR's mandate was also to test how the initiative could be scaled up at the national level by testing and monitoring several scenarios within the public education system to determine which activities would most efficiently and cost-effectively improve pupil learning outcomes. For instance, PRIMR included two local languages, Lubukusu and Kikamba, in addition to Kiswahili and English. It also tested an ICT-based intervention in Kisumu. The PRIMR model required that the actual training and classroom support be done by existing government officers and that research be undertaken to understand whether and how these officers would be able to accommodate the PRIMR activities in their daily work, an important consideration that many pilot programs do not take into account (Gove et al., 2017). Worth noting is that local government officers' attention and time are sparse, as they face many competing demands. Thus, many programs that have had statistically significant effects have not been scaled due to a lack of attention to this inherent weakness.

¹ Uwezo means 'capability' in Kiswahili. It is a 5-year initiative that aimed to improve competencies in literacy and numeracy among children aged 6-16 years old in Kenya, Tanzania, and Uganda, by using an innovative approach to social change that is citizen driven and accountable to the public. <http://www.uwezo.net/>.

Due to the nature of its design (i.e a RCT), PRIMR made it feasible to estimate the impact of the intervention on learning. Table 1 below shows PRIMR's impact on English outcomes.

Table 1: Endline impact of PRIMR treatment on English outcomes

Early Grade Reading Assessment (EGRA) subtasks	Overall			Class 1			Class 2		
	Treatment group	Control group	Effect size	Treatment group	Control group	Effect size	Treatment group	Control group	Effect size
Letter-sound fluency (correct letters per minute, clpm)	47.0	25.7	21.3 (0.73)	43.5	24.6	18.9 (0.68)	50.8	26.8	24 (0.78)
Oral reading fluency (correct words per minute, cwpm)	45.1	31.4	13.7 (0.40)	32.2	20.1	12.1 (0.44)	58.9	42.8	16.1 (0.45)
Reading comprehension (%correct out of 5 questions)	34.3	19.4	14.9 (0.38)	21.1	9.8	11.3 (0.38)	48.4	29.1	19.3 (0.44)
Reading at benchmark (% of pupils reading 65 cwpm+)	28.3	12.6	15.7 (0.36)	14.0	4.0	10.0 (0.32)	43.7	21.3	22.4 (0.45)
Average effect size (SD)			0.46			0.47			0.49

Noteworthy, PRIMR had successful English outcomes in treatment schools. For letter-sound fluency, pupils in PRIMR treatment schools identified 47.0 correct letters per minute (clpm), compared to 25.7 letters per minute among pupils in control schools. This represented a causal effect of 21.3 clpm, or 0.73 standard deviations (SD). PRIMR's average effect in oral reading fluency in English was 13.7 correct words per minute (CWPM). This equates to more than one year of normal gain, which is considerably high. Reading comprehension scores in English were more than twice as high in PRIMR (21.1 percent) as they were in control schools (9.8 percent) in Class 1, and the absolute gain in comprehension attributed to PRIMR in Class 2 was 19.3 percent (Piper and Mugenda, 2014). The proportion of pupils reading at benchmark in English by endline was more than twice as high in PRIMR (28.3 percent) as in control schools (12.6 percent). PRIMR demonstrated similar gains in Kiswahili and Mathematics outcomes as assessed during the Kiswahili Early Grade Reading Assessment (EGRA) and Mathematics Early Grade Mathematics Assessment.

PRIMR was much more cost-effective than the MoE system as evidenced in a cost-effectiveness analysis. PRIMR increased oral reading fluency for English by 13.8 CWPM per U.S. dollar, while the MoE system increased oral reading fluency by 8.8 CWPM per U.S. dollar. The cost-effectiveness benefit of PRIMR was even more evident for the measure looking at the percentage of pupils reading at the Kenya National Examinations Council (KNEC) benchmark. This shows that for both English and Kiswahili, the PRIMR treatment was more than two and nearly three times as cost-effective as the MoE system (Piper and Mugenda, 2014).

Owing to its overwhelming success, the literacy component was scaled up under a new name, Tusome. On the other hand, the numeracy component was scaled up under the Kenya Primary Education Development Project with funding from Global Partnership for Education.

1.3 PRINCIPAL LESSONS AND EVIDENCE LEARNED FROM PRIMR

For early grade reading to be scaled, PRIMR, had to reach certain set milestones and also have a high buy-in by all the stakeholders involved. The GoK has always described basic education as the bedrock of national development and this has been demonstrated by the efforts shown in the NESSP, which aims at improving early grade literacy and numeracy outcomes. Despite the government's efforts to achieve universal education coverage, previous research consistently indicated that children in lower primary classes did not have the requisite skills in literacy and numeracy (Piper and Mugenda, 2012). When the PRIMR initiative was birthed in 2011 as a RCT, the MoE, in collaboration with the USAID and DFID, made a commitment to ensure the literacy and numeracy outcomes of Class 1 and 2 pupils improved. The MoE, through KNEC, set reading benchmarks for Class 1 and 2 as shown in Table 2 below.

Table 2: Reading fluency benchmarks for Class 1 and 2 in Kenya

	Kiswahili (CWPM)	English (CWPM)
Class 1	17	45
Class 2	45	60

Learners were expected to comprehend at least 80 percent of what they read to meet the comprehension benchmarks.

From Table 2, pupils in Class 2 reaching the benchmark in Kiswahili, for instance, needed to read a minimum of 45 CWPM. Throughout PRIMR's implementation, grade-appropriate oral reading fluency and comprehension increased for pupils in Classes 1 and 2 with learners in PRIMR schools being twice as likely as those in control schools to meet the MoE's benchmark for reading fluency and comprehension. This was a key benchmark result that all PRIMR stakeholders had to achieve to demonstrate that PRIMR's interventions improved pupils' literacy outcomes. It is important to note that the greater length of words in Kiswahili- an agglutinative language- was the primary reason for its lower benchmark levels.

For PRIMR to be scaled to Tusome, it needed to reach certain milestones set by the program's stakeholders, including proof that interventions developed and piloted through PRIMR were successful. The endline assessment report indicated that the proportion of pupils reading at the benchmark was nine times larger in Class 1 and twice as large in Class 2. Overall, the outcomes of PRIMR were much higher than at midterm assessment and much higher than expected given the challenges of implementation in 2013 (June and July) when the second teachers' strike occurred. The second strike was longer than the one PRIMR had endured in September 2012. In addition, Kenya held a national general election in March 2013. Political activities that precede any given election affect the daily functioning of many institutions, including schools. Therefore, teachers' instructional time may have been less than ideal. In non-formal schools supported by PRIMR, the turnover rates were very high, with many teachers trained under PRIMR changing schools. In spite of these challenges, PRIMR saw high levels of take-up by teachers and head teachers, an increased demand for PRIMR, increased enrollment in PRIMR schools, and an ongoing enthusiasm for the program by county education offices and TSC officers (RTI, 2013). It's based on the achievement of these milestones that Tusome was birthed, so as to scale PRIMR intervention to the national level.

2.0 REVIEW OBJECTIVES & METHODOLOGY

2.1 OBJECTIVES AND RESEARCH QUESTIONS

The purpose of this desk review is to provide an analysis of the scale-up of the Tusome Early Grade Reading Program in Kenya from 2014-2019, the challenges it faced, and the factors that enabled the Kenyan (MoE) to scale and sustain this program. This desk review provides critical answers to the following questions:

1. How did Tusome emerge from PRIMR?
2. What are the factors that contributed to the success of Tusome?
3. What are the challenges that were faced during the transition from PRIMR to Tusome?
4. How did Tusome mitigate these challenges?
5. How did the Tusome program approach sustainability and institutionalization?

2.2 METHODOLOGY

Publications on early grade reading programs implemented in Kenya were identified and for review and analysis by the desk review team. The publications were sub-categorized as “Background documents,” “Tier 1” (very relevant), and “Tier 2” (somewhat relevant). Some of these documents were evaluation reports for both PRIMR and Tusome programs, while others were peer-reviewed journal articles on both programs, and policy and strategy reports. We identified the documents through 1) emails to USAID Kenya/EA, USAID/Washington DC, and RTI, the implementer of Tusome, 2) a systematic database search conducted by Makerere University and University of Nairobi research teams, and 3) internet searches.

3.0 THE TUSOME PROGRAM

The Tusome program took its name from the Kiswahili word for “Let’s Read.” The name was not only homegrown, but also a unique collective term with nuances of inclusivity –*let us* read– the clarion call inherent in the word essentially invites all stakeholders to take an active role in the all-important act of reading and to ensure early grade learners are learning to read and latching onto reading within a few days of starting school. The name endeared the program to many Kenyans.

Tusome is set apart by two major aspects: its strong evidence-based approach drawn from the highly successful PRIMR initiative and its ability to be implemented at the national scale in a cost-effective way (Piper et al., 2016a). Tusome focuses on five key interventions that were developed and proven under PRIMR to improve pupils’ learning outcomes, namely: 1) Enhancing teachers’ capacity to effectively deliver classroom instructions; 2) Improving schools’ access and use of appropriate core- and supplemental reading instructional materials and resources; 3) Enhancing instructional support and supervision; 4) Integrating the use of information and communications technology (ICT) and data through Curriculum Support Officers’ (CSOs’) tablets, nationally; and 5) Enhancing collaboration with other literacy actors locally and internationally (USAID, 2017a).

Tusome was designed to go beyond PRIMR’s success to achieve even greater improvements in literacy levels for approximately seven million Kenyan children in Grades 1–3 between 2014 and 2019, in more than 23,000 public schools and 1,500 APBET institutions (Crouch and DeStefano, 2017). By the end of 2019, Tusome will have supported literacy development and fostered a reading culture among early-grade pupils, including those with visual and hearing impairments. Noteworthy, Tusome was implemented under the watch of MoE, and most of its goals were aligned with the NESSP, which made the MoE’s work easier.

3.1 FACTORS THAT POSITIVELY AFFECTED TUSOME

3.1.1 Policy Environment

The Constitution of Kenya recognizes that all children, youths, and adults should have access to quality basic education as a human right. Furthermore, the Constitution states that basic education should be free and compulsory to all children. On the side of teachers, the Teacher Service Commission shall review the standards of education and training of persons entering the teaching service. The National Government is responsible for the education policy, standards, curricula, and examinations (Constitution, 2010).

The Basic Education Act of 2013 articulates that it is the responsibility of the government to provide quality basic education to every child. The Act emphasizes the right of a child to free and compulsory primary and secondary education in all public schools. It provides for the regulation and progressive development of the education sector. The Act clearly lays out the roles and responsibilities of the different stakeholders within the sector. The Act outlines the responsibilities of the Government, including provision of infrastructure and resources such as human resources, learning and teaching equipment, and special needs education. The Act ensures that children in marginalized, vulnerable, or disadvantaged groups are not discriminated against and prevented from pursuing basic education (Kenya, 2013).

The 2009 APBET policy ensures all institutions delivering alternative education and training are registered with the MoE. The APBET institutions are established under public-private partnership for the provision of basic education or vocational training to children and youth who, due to



difficult circumstances, are unable to access public or private schools in informal settlements and other hard-to-reach areas. These institutions compliment the government's effort to provide education and training to all. They provide basic education and training to marginalized and low-income areas and within pockets of poverty in Kenya. It is also worth noting that in 2015, the MoE established guidelines to regulate the establishment, registration, and operation of APBET institutions. The guidelines also direct the Cabinet Secretary (MoE) in exercise of authority pursuant to the Basic Education Act section 95 (i) and (j) in respect of basic education APBET institutions.

One of the focus areas of the 2013-2018 NESSP was raising literacy and numeracy levels among Kenyan children in public and APBET primary schools. Both the GoK and USAID were, and still are, strategically focusing on early grade reading. The NESSP Implementation Plan focused on the urgent need to enroll all students in basic education, raise literacy and numeracy levels, reduce existing disparities, and improve the quality of education. Priority areas included teacher quality, school-level leadership, effective and efficient application of content and pedagogical knowledge in the classroom, increasing resources to the education sector, and targeting improvements and monitoring key results. The priority areas resonated well with Tusome's objectives. Tusome was thus aligned with MoE's 2013-2018 NESSP, with the common goal of improving Kenyan children's early grade literacy and numeracy levels. With this unity in purpose, it was easy for MoE to seamlessly take up the institutionalization, scale up, and sustenance of Tusome. In any case, Tusome's content was provided by the KICD syllabi. Further alignments of Tusome with the NESSP 2018-2022 (in Press) firmly ground literacy as a key priority area for MoE over the next five years. NESSP also aligned education planning with the Medium-Term Plan 2013-2017, Kenya Vision 2030, Jubilee Manifesto (2012), and the Public Financial Management Act of 2012, which made it easier for the Tusome framework to be incorporated, thus contributing to the positive outcomes of the program.

Furthermore, policies to improve access to education were developed specifically for hard-to-reach children through management initiatives with a focus on increasing enrollment and completion rates in basic education. These initiatives include provision of grants to selected schools found in districts classified as Arid and Semi-Arid Lands (ASAL) to mitigate the effects of drought and other natural and man-made calamities that limit parents' ability to not only pay fees, but to also contribute meaningfully to their childrens' learning outcomes. Affirmative action programs such as the Northern Kenya Education Trust and provision of grants to needy public schools in pockets of poverty areas ensure access, retention, and quality of education to marginalized and vulnerable children (MoE, 2014). The National Council for Nomadic Education was established to spearhead education initiatives among nomadic communities in Kenya (MoE, 2014). This made it easy for Tusome to access all children even in the traditionally hard-to-reach areas.

3.1.2. Tusome Design and Leverage of Government

To the Kenyan MoE's credit, the Tusome program was structured to implement the most cost-effective elements that PRIMR showed would work through government systems. It is noteworthy that the PRIMR model required that the actual training and classroom support be done by existing government officers and that research be undertaken to understand whether and how these officers would be able to accommodate the PRIMR activities in their daily work. This was an important consideration that many pilot programs do not take into account (Gove et al., 2017). It is important to note that local government officers' attention and time are sparse as they face many competing demands. As such, many programs that have had statistically significant effects have been unable to be scaled given inattention to this inherent weakness.

3.1.3. Teaching and Learning Materials

Access to textbooks and other reading materials is critical for children in the lower grades who are learning to read (Neuman, 2004). In the higher grades, there seems to be limited effects of reducing the student–textbook ratio, as was confirmed by a study done in Kenya for grades 3 through 8 (Glewwe et al., 2009). Prior to Tusome, the government’s textbook policy mandated a 3:1 student-to-textbook ratio for grades 1 through 3, and indeed the PRIMR baseline assessment report indicated an average ratio of 3:1 in rural and urban locations (Piper and Mugenda, 2012).

There were several factors related to teaching and learning materials that positively impacted the Tusome program. The MoE and other NGOs in Kenya (e.g. Aga Khan Foundation, Bridge International Academies, Bible Translation and Literacy, Education Development Trust, National Book Development Council of Kenya, SIL International, and Story Moja) provided core and supplemental reading instructional materials and resources to different schools prior to the Tusome program. These efforts laid the groundwork for the importance of quality and culturally relevant teacher learning materials (TLMs) and could have contributed to the positive outcomes of Tusome. That said, Tusome developed and will have distributed over 24 million English and Kiswahili textbooks, workbooks, and supplemental readers by December 2019 to pupils in grades 1, 2, and 3, thereby ensuring a pupil to textbook ratio of 1:1.

Tusome materials stand out in terms of their design, development, and use in the early grades. Local reading specialists and linguists, MoE officials, and early grade (English and Kiswahili) language teachers were engaged from the very beginning to design and develop the TLMs using a well-thought-out scope and sequence extracted from the national curriculum provided by Kenya Institute of Curriculum Development (KICD)². The ensuing quality culturally-relevant TLMs included pupil textbooks and teachers’ guides with literacy activities organized sequentially from easiest to most difficult. Teachers’ guides have specific activities matched with pupil’s books. More important was the demonstration by Tusome’s team that a pupil-textbook ratio of 1:1 can be achieved in a cost-effective and efficient way to augment pupils’ literacy (and numeracy) skills (Piper and Mugenda, 2014).

During PRIMR implementation, RTI International sought to answer additional questions on what combinations of instructional approaches would yield the greatest impact. Thus, within PRIMR’s RCT, another trial with two options was included. In Option 1, teachers were simply trained and not provided with any instructional materials. In Option 2, teachers were trained and given a package of teachers’ guides and learner books. Option 2 (where the package of teachers’ guides and learner books was provided) was shown to be more cost-effective than programs that offered only training without these materials (Piper et al., 2018a). Access to reading materials in the school and access to a teacher’s reading instructional guide showed an increase in oral reading fluency for pupils with teachers who reported having them compared to those had none (Piper and Mugenda, 2013).

Provision of a textbook for every pupil is paramount to improving pupils’ literacy (and numeracy) skills. The PRIMR analysis of 2013 costs suggested that the government’s current allocation could pay for a 1:1 ratio of books for all pupils in Kenya without any additional funds required from elsewhere, if the cost of the books were more competitive. This was a recommendation from the endline report of PRIMR that was taken up and implemented by Tusome (Piper and Mugenda, 2014).

² Kenya has a centralized curriculum. KICD is a Semi-Autonomous Governmental Agency (SAGA) whose core mandate is curriculum design, development, piloting, implementation, monitoring and evaluation.

3.1.4. Use of Result-Oriented Research-Based ICT Methods and Kenya's National Tablet Program

In January 2013, selected zones in Kisumu County participated in a three-level ICT-based literacy RCT under the PRIMR ICT program. Option 1 included use of tablets only by Teacher Advisory Centre (TAC) tutors for instructional support. Option 2 included use of tablets by teachers who also received classroom pedagogical support from TAC tutors. Option 3 included use of e-readers by pupils to practice reading. The e-readers were loaded with storybooks, dictionaries, and course books. Tablets (for TAC tutors and teachers) contained the following components: audio lesson plans, which aid in letter sounds and words specific to the lesson; the Papaya™ software application, which allowed more practice of all letter sounds in English and Kiswahili; and Tangerine: Class™, which aided in lesson evaluation. Participants in the three options of the ICT-based trial continued to receive support just like the rest of the schools (i.e. learner books, teachers' guides, core and supplemental readers, and instructional aids alongside teacher training and supervision support). Findings indicated that Option 2 (where teachers used tablets and received TAC Tutor instructional support) showed the highest percentage gains compared to the other two options: use of tutor tablets and pupil e-readers (Piper et al., 2015).

The PRIMR schools where the ICT intervention was implemented showed an improvement in pupils' ability to read. Pupils in these schools were between 1.7 and 2.6 times more likely to read fluently than those in control zones (Piper et al., 2015). The results show that the TAC tutor tablet and teacher tablet interventions had larger impacts on the key variables than the pupil e-reader interventions, although the e-reader group also saw an increase in the proportion of pupils reading at the appropriate benchmarks (Piper and Kwayumba, 2014). The TAC tutor group consistently displayed higher effects compared to the teacher and learner groups. The effects of the TAC tutor and teacher groups can be attributed to training on the PRIMR approach for TAC tutors and teachers, presentation of reading materials in print and electronic format, lesson plans, and ongoing classroom support. The PRIMR instructional approach addressed five components of reading (phonemic awareness, alphabetic principle, fluency, vocabulary, and comprehension in English and Kiswahili). Research-based approaches to teaching literacy do not over-emphasize reading. Instead, they focus on how to use a balanced approach that does not ignore reading as a key element of a literacy approach embracing all four macro language skills: listening, speaking, reading, and writing (Piper et al., 2016b). By contrast, traditional teaching approaches focus more on teaching language rather than teaching pupils how to read (Piper et al., 2015). This means an instructional focus on reading, in addition to listening, speaking, and writing, does matter.

These PRIMR findings guided the design of Kenya's National Tablet Program. The program was designed as a tablet-based instructional support program for CSOs and instructional coaches using ICT. The tablets program was piloted as part of the PRIMR Initiative from 2013 to 2014 and expanded to a national level in 2015 via the Tusome Early Grade Reading Activity. The program provided tablets to CSOs and coaches rather than to teachers or learners. The purpose of the Tablet Program is to deepen the quality of the instructional support given to teachers by Tusome CSOs and coaches. The tablets contain four digital resources:

- 1) Tangerine®:Tutor, which is an Android-based application developed by RTI International. The App contains a classroom observational tool with embedded lesson plans created especially for the Tusome national literacy program, including items for sharing the CSO or instructional coaches' views of the quality of teaching. After each classroom lesson observed by the CSO or coach, the CSO or coach assesses three randomly selected learners on a simple fluency measure. The data collected during the literacy classroom observations are automatically analyzed by Tangerine®:Tutor along

with the students' reading fluency rates. Tangerine®:Tutor software then suggests key points for emphasis to the coach, which the coach can use during a feedback discussion with the teacher at the end of the lesson. Tangerine®:Tutor saves the feedback on the tablet so that when the coach visits that particular teacher again, he or she can reference previous progress.

2) Electronic PDF versions of all Tusome-designed books and materials. These documents are linked to the observational tool on the tablets, for easier reference during classroom visits. This allows the coach to compare what the teachers' guide suggests with what is actually being done in classrooms.

3) Thirty short instructional videos in English and Kiswahili which serve as visual examples of how teachers effectively teach particular components of the Tusome instructional approach. Many of the videos have embedded quizzes that the CSO or coach can administer to the teachers. Furthermore, the Tangerine®:Tutor tool can recommend particular videos for the coach to show the teacher based on the results from the classroom observations and the student fluency measurement.

4) A letter-sound practice tool called Papaya™ to guide CSOs, coaches, and teachers on the proper pronunciations while handling English and Kiswahili lessons. They can use the software to practice hearing and pronunciation of certain letter sounds that are the most problematic to them. Papaya™ has recordings of the correct letter sounds for both languages. Papaya™ also allows CSOs, coaches, and teachers to record their own pronunciation of the letters to compare with the examples provided. Furthermore, the Tangerine®:Tutor feedback can recommend that the teacher uses the letter-sound practice tool if the classroom observational data highlights consistent problems in letter-sound accuracy.

The integration of ICT into basic education has enabled the Kenyan government to access real time data on classroom instructional support done by the CSOs and coaches through the cloud and the dashboard. Kenya's education system at the subnational level is managed by Directors. Each county has a MoE County Director of Education, who supervises the education system and policy implementation. There is also a Teachers' Service Commission County Director, who oversees teachers and instructional practices. In order to strengthen the MoE accountability structures at the national level to the counties, and from the counties to the CSOs and coaches, each Director was given a tablet. A dashboard was designed on the tablets and the Cabinet Secretary, Principal Secretary, national-level Directors, and county-level Directors were trained on how to view the dashboard and use it to expand accountability. The dashboard allows national-level educational directors to compare performance between (and within) counties and between zones or clusters.³ Every month, the dashboard aggregates the number of visits performed by the CSOs and coaches. The national education leaders and county directors are sent a monthly email with a literacy performance summary with links to the active dashboard. Tangerine®:Tutor captures GPS coordinates for each classroom observation location. The dashboard also produces a map of the visits so that county-level officers can hold the CSOs and coaches accountable for the number of visits they make per month and confirm that those visits are legitimate ones.

³ Zones are groups of public schools, typically ranging from 15 to 30 schools in a geographic area and are supported by the TSC-hired CSOs. Clusters are groups of APBET schools that are privately managed and serve populations in nonformal settlements or slum areas of Nairobi, Mombasa, Kisumu, and Nakuru, the largest cities in Kenya.

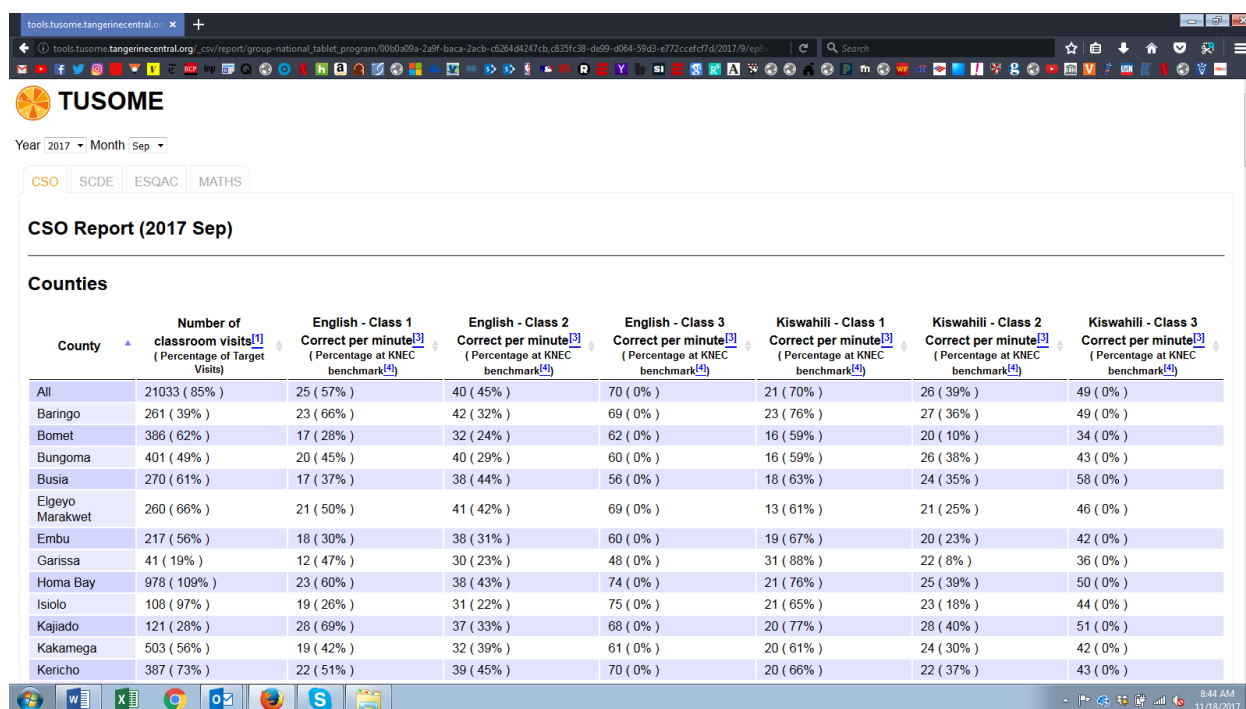


Fig. 1: Dashboard from the National Tablets Program

3.1.5. Teacher Training and Supervision

CSOs, instructional coaches, school administrators and teachers were trained based on practical classroom-based experiences. Emphasis was put on training CSOs and teachers on the instructional materials' features, components of reading, and how to use the tools embedded in the Tusome program. The Tusome training for CSOs and coaches focused on instructional coaching and improvement, with further training on how to use technology as a tool to coach teachers. Tablet training was done for Grades 1, 2 and 3 teachers. The training increased teachers' efficacy in using the tablets to support ICT-based learning that has proven to advance the outcomes of the Tusome project (Piper et al., 2016b). Furthermore, these trainings helped develop teachers' pedagogical and content knowledge in critical technical areas that have a high impact on learners' reading development and instructional quality, such as phonemic awareness, reading comprehension, lesson planning, and curriculum coverage (USAID, 2017a).⁴

Head teachers (Principals) were also trained to provide instructional leadership in their schools and manage the acquisition, utilization, and maintenance of the new core and supplemental reading instructional materials.

Senior county and national education leaders were trained on new reading techniques and how to address gaps in the relevant laws, policies, strategies, and regulations that impact early-grade reading, thus contributing to the success of the Tusome program (Piper and Mugenda, 2014). They were also instructed on assessing learners' reading abilities and uploading real-time performance

⁴ This entailed walking teachers through the scope of lessons that the learners have to undertake during the school year in Grade 1 and 2. Emphasis was placed on not teachers skipping any lesson but rather teaching it in the order in which it was laid out given that the lessons were sequentially organized with a previous lesson providing background knowledge necessary for subsequent lessons.

data through cloud computing. In that way, the data were made available to local and national education stakeholders and fostered accountability throughout the system (USAID, 2017a).

Teachers' capacities to deliver quality instruction in literacy and numeracy were enhanced through continuous trainings. During the trainings, the teachers got ample opportunities to practice new and effective institutional strategies. When the teachers went back to their schools, CSOs⁵ and instructional coaches followed them to provide on-going institutional support, coaching, and mentoring. Whereas not all teacher professional development programs are successful, studies in Kenya have found that teacher professional development and training programs can improve teachers' literacy knowledge (Dubeck et al., 2015). Teacher professional development and coaching, coupled with provision of quality cultural relevant textbooks, structured teachers' guides, and supplemental reading materials had a positive impact on student outcomes (Piper et al., 2018b).

The Tusome teacher training model was the same as that for PRIMR. The only difference was the number of training days per year. Six training days per year were affordable at the national scale compared with 10 days of teacher professional development under PRIMR (Piper et al., 2018b). This was also demonstrated by similar studies conducted by other scholars (Fleisch, 2012, Pritchett, 2015), hence facilitating its scale up. Furthermore, PRIMR's findings indicated that coaches did improve the literacy program and that a 15:1 school-to-coach ratio was more cost-effective than a 10:1 ratio (Piper and Zuilkowski, 2015).

An increase in the frequency of lesson plan reviews, coupled with an increase in classroom libraries, resulted in better pupil outcomes; oral reading fluency scores of pupils in schools that had classroom libraries were higher than those in schools with no libraries. Female teachers and head teachers were also found to have a positive impact on the Tusome project compared to their male counterparts. Availability of guidelines for reading instruction in English and Kiswahili improved teachers' abilities to teach. About 83 percent of the Tusome teachers received three training sessions a year and this could have enhanced their teaching skills which, in turn, resulted in Tusome's positive outcomes (Piper and Mugenda, 2013).

Findings indicate that pupils in APBET⁶ and urban schools significantly outperformed pupils in formal and rural schools. Noteworthy, many teachers in APBET schools are usually high school graduates without formal teacher training. These teachers are paid poorly (about US \$10 a month) and work in squalid conditions with little or no instructional materials. They do not have job security. APBET school proprietors may fire them at any time, especially if learning outcomes in their classrooms remain low. As a result, the teachers are under constant pressure to perform well or risk losing their jobs. Perhaps, this pressure was enough to propel them to do a better job in the classroom, but the situation does raise more questions than provide answers. It is against this background that these teachers had a higher uptake of PRIMR and Tusome trainings. These were likely the only capacity building opportunities they may have had to improve their instructional

⁵ Curriculum Support Officers (CSOs) were known as Teacher Advisory Centre (TAC) Tutors or TAC Tutors. This is the title that was used during PRIMR. The name was changed to CSOs during Tusome as part of a re-defining of their roles and mind-set shift towards positive teacher support, mentoring and coaching. This was important for Tusome because there had been a history of school inspectors and TAC Tutors harassing teacher and finding faults in their instruction practice. A re-training of the TAC Tutors was absolutely necessary for better understanding of their new role.

⁶ These are schools found in informal settlements or slums of major cities and were previously known as non-formal schools. APBET schools are set up and managed by private proprietors.

practice. It is also possible that Tusome instructional materials were the only materials these teachers may have had to use in their classrooms.

Pupils in classrooms where English was the language of instruction outperformed their peers, in both English and Kiswahili oral reading fluency, compared with classrooms that used Kiswahili or a mother tongue (Piper and Mugenda, 2014). Interestingly, and based on evidence from other research, reading comprehension outcomes varied in contexts where trials were undertaken using mother tongue (i.e., Lubukusu and Kikamba), Kiswahili, and English; comprehension scores were highest in a mother tongue, followed by Kiswahili and lastly English. So, though the oral reading fluency may have been highest in English, Kiswahili, then mother tongue respectively, the reading comprehension scores were in reverse order. Bear in mind that more than half the schools use Kiswahili as the language of instruction for Classes 1 and 2, while about 30 percent use a mother tongue, and 18 percent use English. Mother tongue(s) or Kiswahili are often the default languages at home, which may explain the reading comprehension outcomes. This was more evident when listening comprehension activities were used to assess reading comprehension (Piper and Mugenda, 2014).

Improvements in literacy (and numeracy) outcomes can be attributed to the frequency of supervision given to teachers under PRIMR and later integrated into Tusome. Findings from the Kisumu ICT brief illustrated that the higher the frequency of supervision visits, the higher the gains in learning outcomes. During supervision, TAC tutors identified areas in which teachers needed more support and retrained them using modeling. PRIMR ICT treatment schools demonstrated remarkable improvements in oral reading fluency—as high as 300 percent in Barkorwa zone. This was attributed to training on the PRIMR approach for TAC tutors and teachers, the improved reading materials, lesson plans, and on-going classroom support. PRIMR recommended that TAC tutors visit and support teachers in a collaborative manner once per month. An increased emphasis on instructional quality as a core part of the TAC tutor’s job was essential to improving literacy (and numeracy) findings across Kenya (Piper et al., 2016b).

3.1.6. Economic Factors/Government Spending

The NESSP 2018-2022 (in Press) indicates that in constant 2014 prices, the economy increased by 24 percent, from a GDP of close to KES. 4.8 trillion in 2013 to about KES. 7 trillion in 2017. The NESSP adds that the real GDP annual growth rate averaged 5.6 percent, declining from 5.9 percent in 2016 to 4.9 percent in 2017. NESSP also states that the average wealth of Kenyans increased steadily during the 2012-2017 period. In real terms, the GDP per capita increased by 11 percent, from about KES. 87,000 in 2013 to KES. 96,000 in 2017.

The NESSP 2018-2022 (in Press) indicates that Kenya’s fiscal outturn during the financial years 2012/13 to 2017/18 shows that expenditures were above revenues by about 8 percentage points. Over this period, total revenues, excluding grants, averaged about 19 percent of GDP and are forecasted to stay that way for the foreseeable future. During the same period, total government spending averaged 30 percent of GDP. Recurrent spending takes the largest share of government spending as shown in Table 3 below.

Table 3: Government resources and spending as a % of GDP at current market prices

	2013/14	2014/15	2015/16	2016/17	2017/18
Total revenues excluding grants	19.9	19.6	18.8	19.1	22.1
Total government expenditure	30.4	33.6	30.4	30.1	35.9

Source: NESSP 2018-2022 (in Press).

Table 3 reflects an over-expenditure by the Government of Kenya (GoK). That notwithstanding, the GoK invests heavily in the education sector by committing around 5 percent of GDP to the sector annually as shown in Table 4 below.

Table 4: Government expenditure on education (2010/11 to 2015/16)

	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16*
Government expenditure on education (KES millions)	169,093	205,262	230,599	250,551	284,792	319,425
Recurrent Expenditure	159,540	193,811	219,868	235,677	263,537	297,851
Development Expenditure	9,553	11,452	10,731	14,874	21,255	21,574
Percent recurrent expenditure	94.4%	94.4%	95.3%	94.1%	92.5%	93.2%
Education expenditure as a share of total government expenditure	17.7%	20.2%	18.6%	16.3%	14.6%	14.4%
Education expenditure as share of GDP	5.3%	5.5%	5.4%	5.3%	5.3%	5.1%

Source: NESSP 2018-2022 (In Press)

It is important to note that the 5 percent of GDP investment in education is higher than global average of government expenditures on education which is 4.48 percent and Sub-Saharan Africa's average of 3.92 percent (WorldBankGroup, 2011). The high expenditure level reflects the priorities and commitment of the government to the education of its citizens. This commitment to invest in education ensures the efficient provision of 14 years of basic education (two years of pre-primary, eight years of primary, and four years of secondary education). The only down-side is that the real average (public/government) spending (per capita spending) on education per child in the population has remained the same since 2011. The primary sub-sector remains the highest consumer of education budget. Recurrent spending takes the lion's share - nearly 80 percent - with two-thirds of education recurrent resources going to salaries. Noteworthy, public expenditure on primary (and pre-primary and secondary education) mostly benefits the bottom 40 percent of the population and can, therefore, be classified as being pro-poor. According to NESSP 2018-2022, the exception is the more than 60 percent of children from urban informal settlements (slums), especially in large cities, who may not benefit from the public spending in primary education on non-examination related expenditure. NESSP affirms that a significant portion of spending in education is off-budget, mainly from households and development partners.

In spite of the challenges with education financing, it is not far-fetched to state that such commitment and political good will from the GoK positively impacted the Tusome program since it was within the government's mandate to provide better quality education (MoE, 2014). Further as attested by NESSP 2018-2022, the GoK supports the education sector through salary payments, capital and operational grants, and the provision of teaching resources that are critical to the education system's efficiency.

Additionally, policies such as the Education Voucher Scheme (EVS) were set up to target children who were from poor backgrounds and are frequently absent from school or drop-out due to hunger, clothing (uniform), and minor health ailments. As part of the demand-side financing mechanisms, the EVS initiative complimented previous and on-going initiatives of addressing inequality in education through support to poor families, thus improving access to education. The EVS also enabled children who would otherwise be out of school to access and complete the full cycle of quality basic education. This too positively impacted the Tusome project's outcomes (MoE, 2014).

Grants in the form of targeted financial support to address education challenges among marginalized groups and regions were set up by the government. The targeted groups included children from nomadic and disadvantaged communities, learners with special needs, children learning with disabilities, as well as learners in informal settlements, among others. This was done to promote access, retention, quality, and equity in the distribution of educational opportunities for children of nomadic communities and regions. This positively impacted the Tusome project's outcomes since its framework fit within the pre-existing structure (MoE, 2014).

The Tusome program enriched existing grants by adding two special funds to encourage community accountability for better reading outcomes. These were the Youth Fund and the Partnership Fund. The Youth Fund empowered local youth groups to work with younger children in their communities to improve reading skills. The Partnership Fund linked public and private-sector partners to develop local reading programs and instill a reading culture across the country (USAID, 2017a). In a sense, the two funds helped create reading champions outside of formal education structures (USAID, 2017a).

3.1.7. Infrastructural Factors

The GoK was, and still is, committed to ensuring universal primary education for all pupils. The GoK demonstrated this commitment by providing electricity to 83 percent of public schools. Computer rooms were built, and computers provided for pupils in about 46 percent of the schools. The government also rolled out a school feeding program to about 44.1 percent of the schools (Piper and Mugenda, 2013). Results from both the PRIMR endline and Tusome midline evaluations, however, indicate that pupils in schools with and without a functional library show small and inconsistent differences. The differences based on where the school gets its textbooks are inconclusive, as are the differences between schools with electricity, a feeding program, and a computer room (Freudenberger and Davis, 2017).

3.1.8. Learner Factors

During PRIMR, children from the highest income households were better at oral reading fluency compared to their counterparts with lower social economic status (SES). However, SES differences for oral reading fluency were not statistically significant (Piper and Mugenda, 2013). Therefore, a quality literacy program such as Tusome has the potential to ameliorate SES factors and improve reading outcomes of learners from low- and middle-income households. Findings from the PRIMR

endline evaluation report indicated that pupils who had electricity at home read 18.8 CWPM more fluently than those who did not, and those with a television set at home read 17.0 CWPM more fluently than those who did not. Other social factors that were associated with good oral reading fluency include having a toilet inside a home and possessing a refrigerator at home (Piper et al., 2016).

Pupils of the correct age range (5 to 9 years old), enrolled in Classes 1 and 2, showed better learning outcomes compared to those that were enrolled outside that age bracket. Therefore, pupils who enrolled at the age-appropriate grade level and/or started school on time demonstrated better reading (and numeracy) outcomes. This also contributed to the Tusome program's positive outcomes.

Findings from the National Assessment System for Monitoring Learner Achievement (NASMLA) for Classes 2 and 3, cited in NESSP 2018-2022 (in Press), surmise and affirm there being a learning crisis mainly among learners from low socio-economic status and those from ASAL areas. There is also a gender difference with girls performing better in literacy, especially at early grades, while boys perform better in numeracy.

The Tusome program provided ample opportunities for pupils to practice reading aloud and reading silently while at school. This practice had been introduced through PRIMR, but was carried forward. The reading practice improved the childrens' oral reading fluency skills during PRIMR with important implications on Tusome (Piper and Mugenda, 2013). In addition, full day school shifts (versus half day) also contributed to better reading (and numeracy) outcomes. The official operating hours for all private and public institutions in Kenya are Monday to Friday; 8:00am to 3:00pm for class hours and 3:30pm to 4:45pm for co-curricular activities (Government, 2015). Pupils in grades 1-3 learn from morning to 12:30 p.m. Starting at 2:00 p.m. teachers conduct remedial lessons. They may target struggling readers and/or catch up on some reading (or numeracy) activities that may not have been covered during the lesson. As the teachers provide remediation to some pupils, others may have more time to read for pleasure with important implications on reading outcomes.

Other factors include absenteeism, which significantly affects learner achievements, as well as pupils whose parents regularly meet with teachers show higher achievement levels compared to those whose parents infrequently hold meetings with teachers.

3.2 FACTORS THAT NEGATIVELY AFFECTED TUSOME

Although the GoK was committed to ensuring universal quality education, about 82.1 percent of the schools lacked functional libraries for both staff and pupils, something that could have negatively impacted Tusome's outcomes (Piper and Mugenda, 2013). Lack of proper sanitation facilities in most households and access to safe drinking water could have negatively impacted pupils' learning outcomes and in turn affected the overall outcome of Tusome (Piper and Mugenda, 2014). NESSP 2018-2022 (in Press) outlines other equally important factors that affected access to quality education and may have affected Tusome. These include direct costs on uniforms and school meals, indirect costs related to poverty, insecurity, retrogressive cultural practices, early pregnancies, long distances to schools, inadequate gender sensitive sanitary facilities, and lack of food and water at home.

3.3 TUSOME'S KEY STAKEHOLDERS AND THEIR CONTRIBUTION TO SCALING OF PROGRAM

Tusome was funded by USAID/Kenya and DFID and implemented by RTI International. A coordinating team was appointed by the Ministry of Education, Science and Technology, the main government implementing ministry. The Tusome National Technical Team was formed and composed of senior officers from the MoE. The team developed a wide range of partnerships with institutions across Kenya that are playing a role in Tusome's implementation. The team also conducted numerous workshops, trainings, and sensitization meetings that involved stakeholders from all of Kenya's 47 counties. In addition, the Tusome technical team often followed CSOs to the classroom and to their subsequent one-on-one sessions with teachers and then gave feedback on the quality of the CSOs' instructional support.

Members included Kiswahili, English, and math subject specialists from MoE and within the Directorate of Quality Assurance and Standards that conducted standard assessments in education institutions, upgraded teachers' pedagogical skills and advisory services to education managers across the education sector, and participated in the process of curriculum development by chairing all curriculum committees at KICD. Other representatives were also appointed from relevant Semi-Autonomous Government Agencies (SAGAs), such as English, Kiswahili, and math specialists from KICD that were involved in the development of curriculum support materials for the three subjects. Those from the KNEC were responsible for setting benchmark exams for pupils and assessing their performance in the three subjects, as well as those from the Kenya Education Management Institute. Representatives from Kenya Institute of Special Education and the Kenya Institute for the Blind were mandated to produce instructional materials for learners with visual and hearing impairment and training teachers in special needs education. Special needs education is provided in special schools, integrated schools, and in special units attached to regular schools. The TSC provided expert leadership advice to the technical team.

International NGOs like SIL International worked with language consultants to analyze all coursebooks used to teach English and Kiswahili at PRIMR's inception. These were coursebooks approved by KICD and published in the Orange Book. SIL identified gaps in those coursebooks, and based on this analysis, developed initial teachers' guides and learner books for English and Kiswahili. SIL supported PRIMR reading instructional materials' revisions in subsequent years. SIL also later supported the development of core- and supplemental reading instructional materials for mother-tongue programs in the Lubukusu and Kikamba languages, funded under the DFID Rural Expansion Program (Piper and Mugenda, 2014).

Representatives of the Primary Teacher Training Colleges (PTTCs) participated in the trainings of both pre-service and in-service teachers on Early Grade Reading techniques. WorldReader's task was the distribution and management of e-readers, loading e-readers with the required number of book titles and updating them each term, training TAC tutors and teachers especially those in e-reader zones, and supervising TAC tutors. The role of the TAC tutors was to visit and observe teachers in their respective classrooms. Each TAC tutor was responsible for between 10 and 15 schools based on the geographic location of the schools.

Other stakeholders included formal and low-cost private schools that were the main beneficiaries of the project as they enrolled pupils, teachers who taught the pupils and implemented the program, head teachers who also implemented the project, and supervised the teachers and pupils of Class 1 and 2 that were the primary beneficiaries (Piper and Mugenda, 2014).

3.4 CHALLENGES FACED BY TUSOME

Some of the challenges that had been described by the NESSP were still the same challenges that were met by PRIMR. PRIMR tried to mitigate the challenges and the resulting solutions were upheld in the implementation of Tusome. However, some of the challenges spilled over into Tusome. Gaps at the national level included limited monitoring and evaluation capacity for the education system, inadequate data on APBET schools for quality education, and training and weak linkages to EMIS (MoE, 2014).

APBET schools were set up and managed by individual proprietors in informal settlements. Many schools were outgrowths of faith- and community-based efforts to deal with challenges in informal settlements. The proprietors varied in their management of schools and the teaching staff. Some schools were 'makeshift' depending on the funding streams available to them at any given time. They were thus not officially registered with the MoE. This made it difficult to map the exact number of schools in informal settlements. In addition, proprietors of such schools were suspicious of visitors inquiring about their schools, fearing arrests and prosecutions and/or closure of their schools. The general set-up of informal settlements without proper roads and transportation systems made accessibility for education services difficult. Some sections of the informal settlements were not safe, thus, further compromising the access to universal education that was guaranteed to all pupils.

Agencies within the MoE were affected by weak governance and management structures and inadequate funding for the planned initiatives and operations. Other challenges included large numbers of untrained teachers and lack of clear certification and accreditation mechanisms to facilitate entry and re-entry to formal schooling levels (MoE, 2014).

There was inadequate staff management by the MoE and unmet staff development needs to cope with the ever-changing student needs and dynamic technological advancements. There was also an unsystematic staff redeployment that caused low morale and low motivation that consequently affected education service delivery.

In some cases, the underutilization of the education workforce at the national level contributed to high staff turnover. The MoE also lacked the capacity to impart new key competencies that were needed to enable staff to fit and function well in the education sector. There were limited opportunities for staff capacity building as the appraisal system was viewed by many as a bureaucratic process with little relevance to improving performance and accountability.

Further, some In-Service Education and Training (INSET) events took place without proper coordination or even being assessed for their quality and effectiveness. There was also a low commitment of specialized personnel seconded to MoE by other Departments. All these affected the quality of education that was delivered (MoE, 2014).

The MoE also estimated about 250,000 vulnerable school-age children, some of whom fell within the Tusome target group, faced challenges in accessing quality education due to natural or man-made disasters annually, especially in marginalized districts and nomadic areas of ASAL. Equally, about 8,000 teachers were also faced with the same situation (MoE, 2014).

At PRIMR's inception, few schools (40 percent) were connected to the electric power grid and 35 percent of the schools did not have access to a clean water supply and sanitary facilities. Some land/schools were owned by individuals, Faith Based Organizations (FBOs)/NGOs, and communities, which posed challenges concerning registration by the department of education. The

pre-existing infrastructure and land size did not meet the current department of education standards compared with expected pupil enrollments (MoE, 2014). It was also established that 55 percent of the schools did not have any school feeding program for the pupils, 75 percent of the schools did not have books in their libraries, 88 percent of the teachers did not have computers, and 95 percent of the pupils also equally lacked computers (Piper and Mugenda, 2014).

At PRIMR's inception, the textbook procurement system was left to schools. The MoE disbursed capitation funds directly to schools. Schools were responsible for making decisions on which textbooks to purchase from the Orange Book of textbooks approved by KICD. This scenario provided business opportunities for publishers to push their books to be included in the Orange Book as well as ensure as many schools as possible purchased their books. The early grades were thus the biggest market for publishers and may have, inadvertently, contributed to cut-throat business and potential conflict-of-interest by different stakeholders. This had important implications on the quality of textbooks ending up in the classrooms with some publishers by-passing the KICD vetting process. From 2012, PRIMR developed their own instructional materials for Class 1 and 2 in three subjects: English, Kiswahili, and mathematics and immediately set itself at cross-hairs with publishing houses. The situation was worsened with the national scale-up of Tusome. Whereas managing publishers was a challenge within PRIMR, Tusome demonstrated to MoE that they could cost-effectively achieve the 1:1 textbook-learner ratio of quality instructional materials through a centralized procurement system.

3.5 MITIGATION OF CHALLENGES FACED BY TUSOME

PRIMR undertook a comprehensive and in-depth study on existing textbook policy, with a view of proposing strategic and effective options for consideration by the government. Results revealed that 46 percent of the primary schools sampled had average textbook-pupil ratios of 1:10 in English, Kiswahili, and mathematics, in spite of the large infusions of funds for this purpose over the past decade (Piper and Mugenda, 2014). A probable explanation is the mismanagement of capitation funds by some school administration in collusion with some publishing firms. PRIMR proposed that textbook distribution to schools be done centrally, thereby eliminating the direct channeling of finances to schools. Private publishers were also advised to continue participating in the competitive vetting and selection process by KICD as they were also expected to get approved requisitions for all the schools from the respective County Education Board (CEB) and take responsibility for delivering the books to the schools (Piper and Mugenda, 2014). The schools and the CEB would then verify the deliveries before payments were made by the central government, potentially reducing the financial leakages.

The KICD, which controls development of learning materials suggested that essential textbooks for use in literacy (in English and Kiswahili) and numeracy in lower primary be prepared by a group of curriculum specialists under their guidance, and the cheapest source for publication of materials be sought competitively. This would ensure appropriate content delivery using the most suitable pedagogical approaches and at an affordable cost. The PRIMR pilot proved that the cost of producing textbooks in the schools was much cheaper than anticipated. Due to the significant impacts of PRIMR's teaching and learning materials on pupil performance, above that of other textbooks in the market, Tusome project rollout was made much easier as requisite materials (PRIMR books) were availed to the schools (Piper and Mugenda, 2014).

The PRIMR team communicated with the Director of Policy, Partnerships and East African Affairs who advocated for specific research studies to address policy-related issues. The policy issues that were recommended for further study included: curriculum design and development, with

provisions for a school course book as guided by the current MoE book policy; the role of the private sector in the provision of quality education, especially within the informal settlements in the urban areas; and the level of preparedness of pre-service trainees in teaching literacy and numeracy in the primary schools upon graduation from the colleges (Piper and Mugenda, 2014).

The PRIMR project tried addressing some of these challenges by developing the capacity of the county educational managers and personnel on their roles, responsibilities, and functions, as well as strengthening accountability and transparency in education and training institutions, and training education managers on performance contracting and ICT integration as a management tool to enhance service delivery. To this end, Tusome supported development of the EMIS system and demonstrated how the MoE would conduct monitoring and evaluation through the Dashboard, an online tool that enables capturing and sharing M&E activities and data by field officers in real time using a GPS system. PRIMR and Tusome also strengthened collaboration between the department of education agencies and other partners in capacity development, developed a policy framework for capacity development of education managers, and continued to design new training activities in response to changes in the education sector. Coordination between education departments was strengthened. The MoE conducted monitoring and evaluation of training activities and trained school leadership on pedagogical leadership to support teachers in an effort to implement skills they had acquired through INSET in the classrooms and support school-based INSET activities. There were also refresher trainings for the staff conducted on a quarterly basis (Piper and Mugenda, 2014).

Tusome trained CSOs, administrators, teachers, and instructional coaches based on practical classroom-based experiences. The trainings helped develop teachers' pedagogical skills in critical technical areas such as phonemic awareness, reading comprehension, lesson planning, and content coverage (Freudenberger and Davis, 2017). Head teachers were also trained to provide instructional leadership for their schools while managing the acquisition, utilization, and maintenance of the new learning materials. Tusome is also on track to develop and distribute over 24 million English and Kiswahili textbooks, workbooks, and supplemental readers by December 2019 to pupils in Classes 1, 2, and 3 to ensure a pupil to textbook ratio of 1:1 (Freudenberger and Davis, 2017).

3.6 SUSTAINABILITY AND INSTITUTIONALIZATION OF TUSOME

According to the sustainability plan, the MoE was to systematically take over the implementation aspects for Tusome. The Ministry was to assume full responsibility of all activities (including instructional materials development, printing and distribution, data management on the dashboard and teacher trainings, professional development and on-going classroom support, and mentoring and coaching) by January 2020 through a gradual release of responsibility from RTI to MoE. This year (2019), the MoE is taking the lead in all the activities and RTI is offering technical and logistical support. This began with procuring grade 1 teaching and learning materials, as well as training CSOs, head teachers, and teachers. The positive outcomes demonstrated by the Tusome mid-term assessment invigorated the MoE's zeal to sustain and institutionalize Tusome. Specific efforts from the GoK under the MoE to sustain and institutionalize Tusome include:

- Continuing trainings, capacity building, and consistent support of CSOs. The Teachers Service Commission (TSC) was mandated to manage the CSOs by detailing their terms of service, remuneration, professional development, and career progression. CSOs play a key role by visiting the schools implementing Tusome, and observing and monitoring the inputs and outputs of the activities. The regular visits by CSOs reinforce teachers' adherence to the

sequence of lessons in the teachers' guides and generate data on student learning progress. Quality CSO feedback improves implementation and increases sustainability by ensuring accountability.

- Creating relevant policies that back the continued implementation of the Tusome project in places where it has not been implemented yet and improving the gains in places where it is functional.
- Continuing the trainings of head teachers on how to provide instructional leadership for their schools while managing the acquisition, proper utilization, and maintenance of the new learning materials (Piper and Mugenda, 2014). Conducting workshops between MoE and Tusome Implementing Partners (IPs) that emphasize understanding and setting the approach for teaching reading and the sequence of teaching letters and skills necessary to learn to read. The workshops are important to increase buy-in from IPs, equip them with requisite skills to run Tusome in their areas of jurisdiction, and thereby increase sustainability.
- The MoE, through KICD, infused Tusome interventions into the new Competency-Based Curriculum (CBC) for the Early Years Education (Grades 1-3) which has been rolled out in all public primary schools in Kenya. The Tusome approach covers all four macro-language skills of listening, speaking, reading, and writing in one lesson, with greater emphasis on phonological awareness and alphabetic principle as compared to the traditional approach. Findings from PRIMR showed that this change can be done without losing the thematic organization of the KICD curriculum and that changing the order of instruction is an important reform that can drastically increase the pace of reading acquisition in young pupils, thereby ensuring the sustainability of the program (Piper and Mugenda, 2014).
- The MoE also committed a large portion of yearly funding to education (Piper and Mugenda, 2014a).
- The MoE, through KICD, revised Tusome materials to ensure that they are CBC compliant, acquired copyright of the materials, and will be publishing the materials henceforth to ensure the success and sustainability of Tusome.

The Tusome midline evaluation highlighted the following activity components that had been implemented in schools nationwide: Ninety-eight percent of teachers received at least some Tusome training, 38 percent of Class 1 and 48 percent of Class 2 teachers reported participating in five or more Tusome training sessions, 83 percent of head teachers reported that they received reading instruction training in the past 12 months, 99 percent of teachers had a Tusome teacher's guide in their classroom, 97 percent of Class 1 and 95 percent of Class 2 classrooms had at least one Tusome pupil's book per pupil, 96 percent of classrooms had at least one exercise book per pupil, 84 percent of Class 1 and 82 percent of Class 2 teachers reported being observed about once per term by a CSO, 96 percent of Class 1 and 90 percent of Class 2 teachers reported being observed about once per term by their head teachers, and 54 percent of CSOs observed 15 or more lessons in the 30 days prior to the evaluation.

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