PALACKÝ UNIVERSITY OLOMOUC

Faculty of Science

Department of Development and Environmental Studies

Lucie Podhorná

Role of literacy programs in formal education in Northern Ghana

Case study of Rural Literacy Solution, NGO

Master's thesis

Supervisor: Mgr. Martin SCHLOSSAREK, Ph.D.

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I declare in lieu of oath that I wrote my thesis myself. All information derived from the work of others has been acknowledged in the text and in the enclosed list of references.

In Olomouc, 6 June 2022   ……………………………………

Acknowledgements

ABSTRACT

The theoretical part of the thesis focus on formal education in Ghana and the role of non-profit organizations implementing its literacy programs at states schools. In addition, the author analyzes and evaluates the literacy program of a selected local NGO, Rural Literacy Solution, focused on increasing literacy among school children in rural areas of Northern Ghana.

Keywords: literacy, education, Northern Ghana, literacy programs, evaluation, NGO

Table of contentstable

List of Tables and Figures

Glossary

AAG	Action Aid Ghana
BDID	British Department for International Development
GDCA	Ghana Developing Communities Association
GDP	Gross Domestic Product
GES	Ghana Education Service
GSS	Ghana Statistical Service
CODE	Canadian Organization for Development of Education
EGRA	Early Grade Reading Assessment
FLP	Functional Literacy Programmes
JPP	Jolly Phonics programme
LL	Log likelihood
MCC	Millennium Change Corporation
NGO	Non-Governmental Organization
RLS	Rural Literacy Solutions
SFL	School for Life
ULS	Universal Learning Solutions
WB	World Bank
WVG	World Vision Ghana

I. Theoretical framework

1. Introduction

According to the Ghana Poverty Mapping Report (2019), Northern region has more poor persons than any other district in Ghana. The Northern, Upper East, Upper West, Central, and Western Regions have the highest incidence of poverty, with more than 40% of people living below the poverty line (i.e. less than $1.9 per day). Nineteen of Ghana's 40 poorest districts are located in the three northern regions. This means that Northern Ghana is home to nearly half of the most impoverished districts.

Aside from contributing to economic growth, Budu (2020) claims, education also contributes to social, cultural, and political development. Literacy is one of the prerequisites for obtaining an education. Literate people are more aware of their health and nutrition status and are likely to take advantage of social services available to them. As a result, child and infant mortality rates may be reduced. Mother education has a significantly negative correlation with infant and child mortality. Children born to uneducated mothers have the highest mortality rate. For instance in 2014 according to Ghana Demographic and Health Survey proportion of mortality among children under five years born to mothers with no education was 5,8 % and among children whose mothers had attended secondary school was 4,4%

Northern Ghana's low level of educational development can be traced back to Ghana's colonial past. The fact that Northern Ghana's educational development lags behind the rest of the country are one clear indicator of deprivation. Despite the implementation of certain corrective development measures since independence, the phenomenon of north-south labor drift persists.

In response to the peculiar educational problems in Northern Ghana, the Rural Literacy Solutions (RLS) Programme was developed. The programme is designed as a complementary educational scheme targeted at primary school children between the ages of 6-16, aimed at assisting children to attain basic literacy skills to help them go through elementary school.

This thesis summarizes findings and lessons learned from a recently conducted impact evaluation study of a primary school student's literacy programme in the districts of Northern Ghana. The study was an attempt to assess literacy skills levels. The aim is also to ascertain pupils' levels of knowledge and skills after attending a literacy programme by a selected NGO. Evaluation primarily assesses beneficiaries' achievement, in three categories: *letter sound, word reading, and writing*. The findings from this study are intended to evaluate the programme and perhaps help to improve the current and future functional literacy programs of the organization Rural Literacy Solutions (RLS).

2. Aims and Objectives

This thesis is based on the results of an impact evaluation study of Rural Literacy Solutions' literacy programme.

The thesis aims to evaluate the real functioning of the programme in relation to its stated objectives. Evaluation aims to answer whether RLS is succeeding in improving pupils' skills in letter sound, reading and writing.

The evaluation serves as feedback to the organization implementing the programme and also offers them options for addressing of potential recognized issues. It is also a report for funders to learn how their money is actually helping. The evaluation can also be a useful resource for other literacy programme organizations (current and future), providing information on what works and what does not work in which contexts, what is best avoided and what can be used.

3. Thesis structure

The thesis is split into two sections: I. Theoretical framework, and II. Research. The theoretical framework includes general chapters that are relevant to the topic at hand. Included Chapter 4. Northern Ghana - the broad context, which addresses the general characteristics of the area in which the literacy program under investigation, as well as the research, takes place. Subchapters cover literacy, Ghanaian languages, and concrete literacy programs. Rural Literacy Solution, a separate chapter, introduces the NGO under this study.

In the section II. Research, I deal with the research itself and its results. Chapter 7 discusses the research methodology, the setting of the research design and plan, the research questions, the respondents, the data collection methods and the subsequent data analysis. In this chapter I also discuss the limitations of the research and its validity. Chapter 8 focuses on specifying the characteristics of the specific districts of Northern Ghana where the project and research under study are set. In subchapter 8.2, I discuss the application of data collection methods in more detail. Chapters 9 and 10 then discuss the research results and other findings, which are incorporated here. In Chapter 9, I present the summary results and conclusions of the evaluation, focusing on the impacts of the programme in each of the categories and locations. Chapter 10 provides a summary of the work, followed by recommendations for the organization. The literature is listed in Chapter 12. Graphical annexes (tables, charts, maps, figures) are included in the text or separately in the annexes.

4. Northern Ghana

Northern and Southern regions of Ghana have vastly different educational systems. Despite Ghana's high ranking in Africa due to its natural resources, Northern areas have poor educational infrastructure. Northern politics have hampered educational opportunities. However, things have changed since then. A variety of local and national organizations together with governmental programmes, are currently working in Northern Ghana to boost literacy, not only in schools. This can be demonstrated, for example, by the fact on increased school attendance. The report published by Ghana Statistical Service (2021) indicates that the proportion of the persons three years and older currently attending school in the Northern, Savannah, North East, Upper East and Upper West regions is about twice as high as those who attended in the past years.

Ghana was the first African country to break free from colonial rule by the British. On March 6 1957, Kwame Nkrumah led the country to independence, while also establishing Pan-African organizations across the continent (Gocking, 2005). Goody (1967) credits the president Nkrumah for spearheading effective efforts in Ghana to increase literacy. Throughout the southern provinces, his administration built and supported a number of schools. As a result, many southern regions have a well-educated young adult population.

In Northern Ghana, this was not the case. According to Goody (1967), due to tribal-nationalist disputes that arose alongside post-colonial governing efforts, the Nkrumah administrations disregarded the Northern region educational system in the 1960s. "We were hoping that when Ghana became independent, the newly all-African government would equip the North with all that was required to free the North from ignorance," President Nkrumah's critics said (Abdulai, 2016). Instead, the Southern-dominated government wanted to keep Northerners down. People in the Northern Ghana were generally perceive as a low-skilled labor for the security services of Southern Territories. W. J.A Jones, Chief Commissioner of the Northern Territories, aptly summarized the Northern Territories' position on the Gold Coast. He reported: "P*eople of the Protectorate, were regarded as an amiable but backward people, useful as soldiers, policemen and laborers in the mines and cocoa farms, in short fit only to be hewers of wood and drawers of water for their brothers in the Colony and Ashanti."* (Bening, 1990, P186)

Things rapidly changed in 2018 when Ghana's current (in 2022) president, Akufo-Addo, pledged to build new schools and provide supplies to all regions (Ministry of Education of Ghana, 2017). He

declares there will be no admission fees, no library fees, no examination fees. There will be free textbooks and free meals.

The Millennium Change Corporation (MCC), which was founded by the United States, has contributed more than $9 million to Ghana's educational sector. This includes funds to build 221 schools in Northern and Southern Ghana. Furthermore, MCC has made ground-breaking investments in education infrastructure since 2007, resulting in increased school access. Improved educational outcomes would reduce poverty through economic growth (Tarnoff, 2014).

To summarize, Ghana has increasingly prioritized education development and illiteracy eradication as a strategy for promoting development and social empowerment since gaining independence in 1957. As a result, the State has enacted a number of educational acts over the last five decades, the most important of which are the Education Act of 1961 and the 1992 Constitution, which established education as a fundamental right for all citizens. Furthermore, in accordance with its constitutional obligations, Ghana has established a number of educational programmes in collaboration with NGOs. This can be demonstrated, for example, with data from the World Bank (2022), in 2017 Ghana has one of the highest investments in education with 20% of the government budget on the educational sector and 11% of the country's GDP invested in public schools.

4.1. Literacy

There are several definitions of literacy. The most commonly used is the one defined by UNESCO.

*"Functioning literacy is **the ability to use reading, writing and numeracy skills for effective functioning and development of the individual and the community**. A person is literate who can, with understanding, both read and write a short statement on his or her everyday life."*

The World Bank, for example, uses this definition. However, since the Ghana Statistical Service (GSS), provides more detailed data, it was finally decided that their definition would be used for the purposes of this research. The main difference in these two definitions is that the GSS, does not take into account numeracy skills. Furthermore, even the research conducted as part of this thesis did not include numeracy skills among the indicators. Literacy is therefore defined as follows:

*"Literacy refers to the ability to **read and write with understanding** in any language."*

According to a report from the GSS (2021) Population and Housing Census the country's literacy rate in 2021 was 69.8 percent, see Table 1. This is an improvement over the 2010 census figures, which showed a rate of 67.1 percent. The data for 2021 are for people aged six and up who can read and

write in any language. Males account for 74.1 percent of the total, while females account for 65.4 percent.

Table 1: Proportion of persons 6 years and older by literacy status
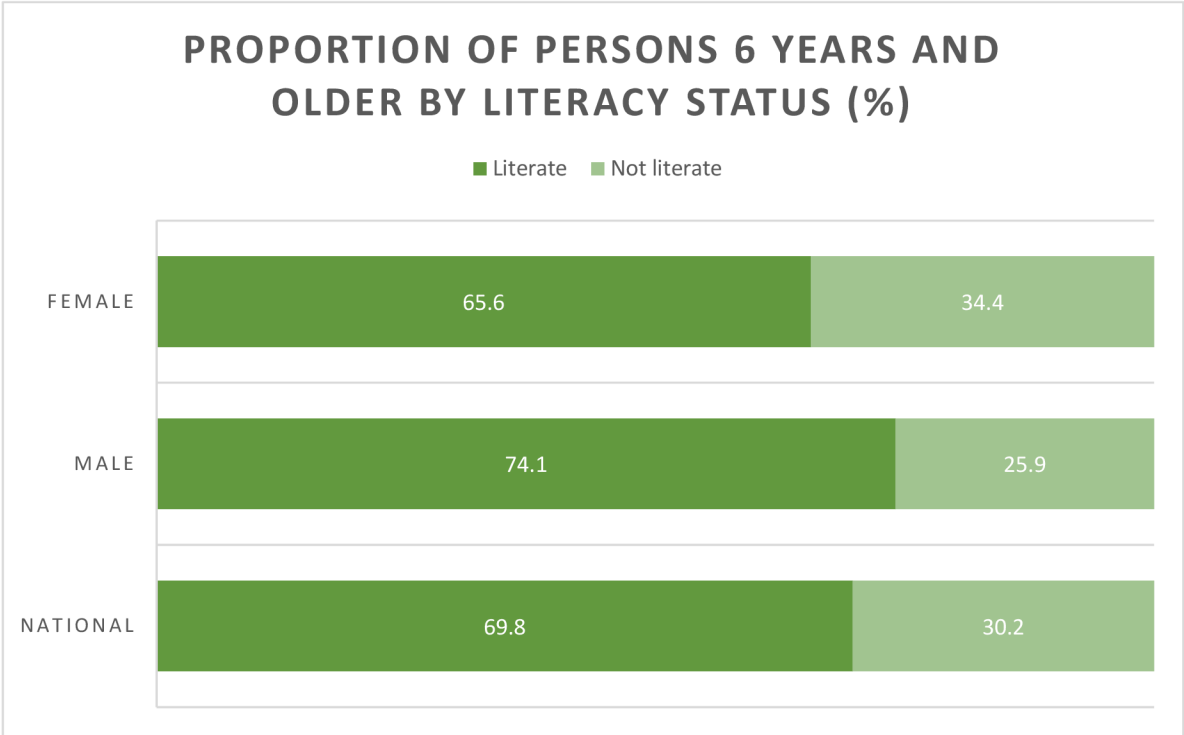
Source: data from GSS (2021)

Table 2 bellow shows literacy rate among people aged six and up in nine of the 16 regions is lower than the national figure (69.8 %), with Greater Accra Region (87.9%) having the highest and Savannah Region (32.8%) having the lowest. When compared to females in 12 regions, the male population in eight regions has a lower literacy rate than the national figure.

Four of the sixteen regions have more than three-quarters (75%) of their population aged 6 and older literate, with Greater Accra Region (87.9%) having the highest and Savannah Region (32.8%) having the lowest. There are seven regions for males and one region for females (Greater Accra), with more than three-quarters (75%) of the population aged 6 and older being literate.

Table 2: Proportion of the population 6 years and older who are literate by sex and region

Region	National	Male	Female
Greater Accra	87,9	91,1	84,9
Ashanti	78	82	74,2
Eastern	75,7	79,7	71,9
Central	75,2	79,9	70,9
Western	72,6	76,5	68,6
Bono	71,5	75,8	67,3
Volta	70,9	76,7	65,8
Ahafo	68,6	72,5	64,5
Western North	62,8	67,5	57,8
Bono East	56,3	60,5	52,2
Oti	50,6	55,8	45,3
Upper East	48,1	52,8	43,7
Upper West	46	50,6	41,7
Northern	41,3	48,1	34,8
North East	35,9	41,3	30,9
Savannah	32,8	36,7	28,9
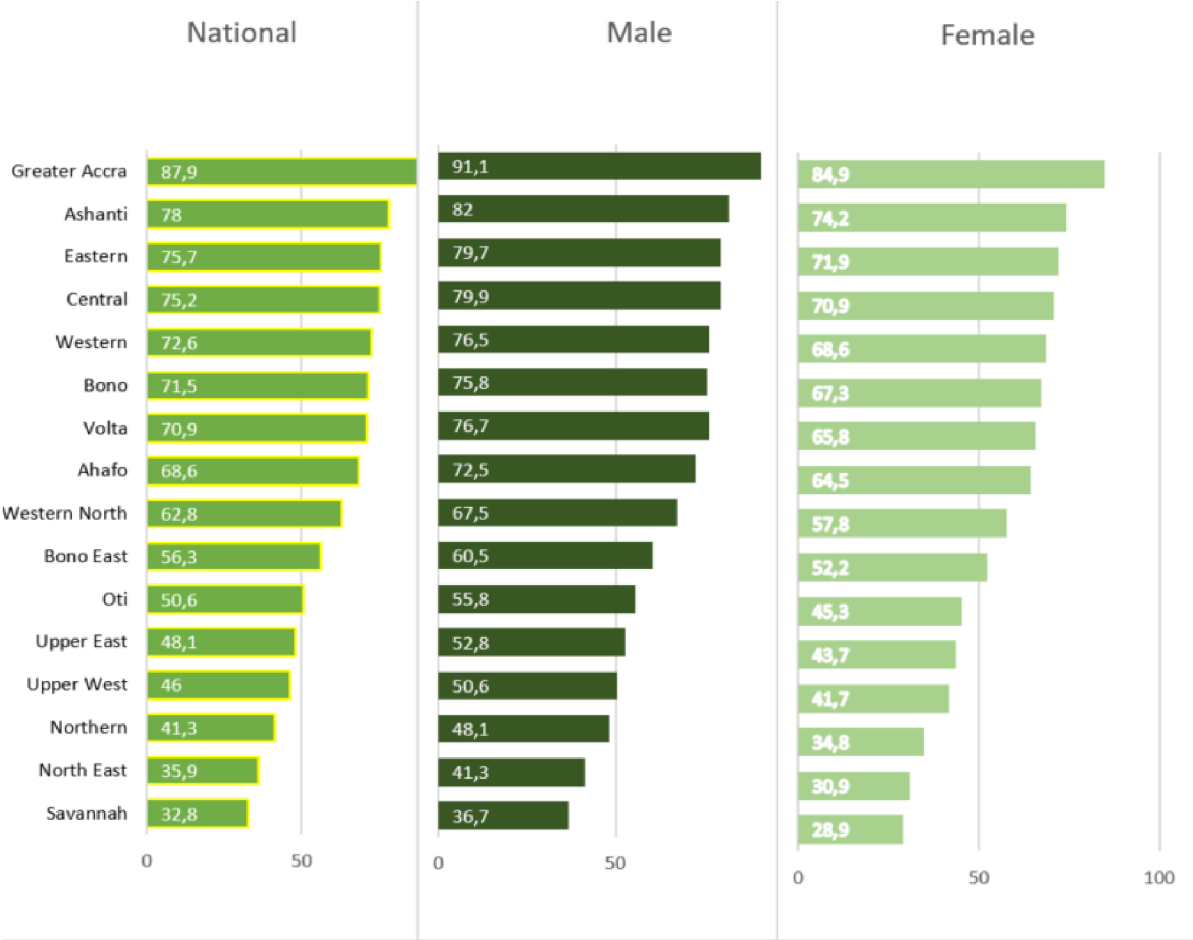
Source: data from GSS (2021)

What I would like to highlight here is the Northern region with a literacy rate of 48.1% for men and 34.8% for women. Which for both sexes is roughly 30 percent less than the national sample. Van der Geest (2011) says the significantly low literacy level of this vast region is due to youth migration to the southern part, which is economically endowed. The practical research of this thesis is therefore also focused on this northern province of Ghana and takes a closer look at the literacy programme of the selected NGO.

Literacy is a major element of the right to an education, along with access to resources and effective communication and interaction between people. As states in Population and Housing Census (2021) the literacy interventions, as part of policies and programmes that promote equality in all aspects of life, contribute to the empowerment of people, particularly women and other disadvantaged people and groups, to participate in social, economic, civic, and cultural activities. Literacy programmes, in particular, are well recognized for their cognitive, psychological, socio-cultural, and economic benefits, such as the high propensity of literate parents to enroll and keep their children in school. Literacy is

also an educational tool that encourages communication, self-expression, knowledge acquisition, the ability to contribute ideas, and a sense of self-worth.

4.2. Languages of Ghana in Education

Ghana, like most sub-Saharan African countries, is highly multilingual with over fifty[1] indigenous languages. The official language and lingua franca is still English, which was inherited from the colonial era (Campbell, 2008). Nine[2] languages have since independence in 1957, been officially approved by the state for use in education. The nine designated local languages are not, however, the medium of teaching; their role in education has shifted over time, depending on successive governments' policies on the use of mother tongue in education (Opoku-Amankwa, 2009).

Akan is the most extensively spoken of Ghana's indigenous languages, particularly in the south. The most widely spoken language in Northern Ghana is Dagbani. The majority of minority language groups live in rural areas in the north; some languages are spoken by thousands of people throughout a large area, while others are only spoken by a few hundred people in a small area. Ghana's official language is English, which is also the country's most widely spoken second language. It is used in government, commerce, and on formal and public events (Street, 2002). What is important for this study is that Ghana has a long history of debates over the language of teaching in schools, showing the complications of living in a country where a wide number of languages are spoken, as in many other African countries. Despite the diversity of indigenous spoken languages, there is no indigenous national language, English was thus chosen by the government as the language of education at all levels.

Among the causes of language shift in Africa, according to Batibo (2005), are demographic superiority, socioeconomic appeal, political domination, and cultural forces. All of these characteristics are present in Ghana, where English, the colonial rulers' language, has put significant pressure on all local languages. Nowadays, because of English's dominant position in today's world, it has nearly forced local languages out of the education. In 2002, the government (2002) announced that all basic school students would receive education in English at all levels. This applies to both private and public schools. Government (2002) claims that early introduction of English to children in primary level, would help to learn the language more effectively and to take part in global trade, industry and technology.

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[1] This number varies widely depending on the sources, most authors give a number between 50-80 languages, depending on what they define as an indigenous language.
[2] Akan (in its three varieties of Asante Twi, Akuapem Twi, and Fante), Dagaare-Wali, Dagbani, Dangme, Ewe, Ga, Gonja, Kasem, and Nzema

These beliefs undoubtedly influenced and were influenced by the government's choice to pursue a national language-in-education policy that favored the use of English beginning in primary school. However, current research in mother-tongue/bilingual education tends to show that poor academic achievement can be linked to the exclusion or limited use of instruction in the home/mother language in many school programs (Dixon, 2014. Mendive, 2020. Eisenchlas, 2013).

Andoh-Kumi (1998) compared academic performance in English-only classes to those where a local language, Fante, was the sole medium of instruction in an experimental study in Ghana. The students in this study took an active role in lessons taught in the local Fante language and felt more confidence to contribute than in English-taught lessons.

On the other hand Hovens (2002) contrasted bilingual and monolingual education programs in West African countries and found that students who began in their mother tongues were able to read and write better in the second language. The study also found that classrooms that used the native language were more interesting, participatory, and relaxed.

Ampiah (2009) in his study of the school dropouts in Northern Ghana found out that difficulty to learn English along with corporal punishment, and irregular weekly and monthly attendance are the main reasons for dropping out of school. While difficulty with the English language resulting 94 % of drop out cases, number of the state education programs, and international and local NGOs are responding to this problem by trying to enrich formal school curricula with English literacy programmes.

4.3. Literacy programmes

Many low-income countries' education developments are according to Akyeampong (2004) characterized by a top-down approach in which a national education system is designed at the top and implemented throughout the country. There is frequently little consideration given to the special needs of certain segments of the population who live in very different and difficult socioeconomic and demographic environments, making a uniform education system unproductive and unappealing. Unlike in many advanced countries, where the socioeconomic environment and infrastructure for equitable delivery of education programmes are much more even, many developing countries, particularly in Africa, can have very uneven conditions, particularly in rural areas. For example, the demand and supply situation for qualified teachers can be extremely precarious.

Hedges (2003) remarks there are numerous cases of teacher shortages and absenteeism in rural communities, which have been attributed to the harsh living and working conditions, and which are a major cause of dysfunctional schools in these areas. Acute poverty is another condition that has been shown to reduce rural participation rates. The direct and indirect costs of basic education

disproportionately affect the poor. Direct costs are incurred as a result of schooling accessories (books, writing materials, uniforms). While indirect costs arise from the loss of income from the child's potential employment or contribution to household income through direct work. All of these are significant barriers to traditional approaches to basic education delivery in Ghana's rural and disadvantaged populations.

Akyeampong (2004) points out that due to many governments' inability to institutionalize strategies that adequately address the challenges of improving access to quality basic education in poor deprived areas, many NGOs and other aid organizations have played an active role with a variety of interventions. Miller-Grandvaux (2002) says that these organizations benefit from adequate funding while also being able to integrate contextual understanding into programme delivery in order to meet the needs of poor communities. Alternative routes to basic education established with aid money have mushroomed all over developing countries over the last two decades, particularly in Northern Ghana, where the strategy has always been to improve children's basic literacy and numeracy skills, with the local community playing active management and supervisory role.

Northern Ghana exemplifies, in many ways that have already been explained above, an environment in which it is difficult to provide basic education for all children through a single-system approach. The following section will provide an overview of literacy programmes in this area before delving deeper into and evaluating the Rural Literacy Solutions programme, which is addressing these challenges and attempting to implement a basic literacy programme in public schools through their trained teachers.

In the late 1960s and early 1970s, *Functional Literacy Programmes* (FLP) entered the international discourse on education policy. It is associated with the ideas of recurrent and lifelong learning. In Ghana, these programmes take various forms: some are organized by the Ghanaian government, while others are organized by international NGOs. This section examines the activities of these organizations in terms of functional literacy. All NGOs implementing their programme under FLP are using different approaches.

For the use of further research, I have tried to choose different variety of programmes to demonstrate various literacy practices. Main aim of the literature research below provide a broader perspective and show approaches of different stakeholders and may be some comparison into the main research of this thesis. I selected three larger programmes that have about 30 years of experience in literacy education in Norther Ghana and one specific program, which has a similar approach as the organization (RLS) that is subject of this research. For selected programmes below will focus mainly on what their processes are for implementing a literacy programme, who their target group is and what is their impact.

Non-Formal Education (NFE)

NFE is a national initiative that has been supported by the government from its beginning in 1991 and continues to be supported by development partners. The World Bank was the programme's primary sponsor. Other sponsors included the British Department for International Development (BDID), the Norwegian and Japanese governments, UNICEF, and the Canadian Organization for Development of Education (CODE).

Ghana Audit Servis in 2003 found out that NFE encompasses both basic literacy (literacy in any Ghanaian dialect) and post literacy, meaning literacy in English. The learners are first taken through primers of Ghanaian languages for a 21-month period, and upon successful completion of a full course in the local language, Basic English classes for the same duration may be organized for the learners.

Friarian methodology is being used as a learning tool, which includes discussions of composite pictures, describing an object or situation, stories, proverbs, role-plays, and drama, singing songs to relieve boredom, and using syllabications to form meaningful words and sentences (Aryeetey and Kwakye, 2006). Literacy class instructors are mostly volunteer facilitators and programme assistants are permanent staff.

It is clear that the functional literacy programme has contributed to the literacy rate of Ghana. In the case of the statistics, they have been made only for WA Municipality, which is located in the Upper West, neighbouring region of the Northern region.

The total number of recruits from batches 8 to 18 is 26,084, with a total of 20,581 graduates. The average dropout rate is 21%, which is slightly higher than the national dropout rate (NFED-Wa Municipality, 2012-2018). The data on those who have graduated from other literacy programmes also contribute to the literate population in the Wa Municipality, resulting in an increase in literacy levels in the municipality and a corresponding decrease in the illiteracy rate.

School for Life (SFL)

SFL began in 1995 in the Northern Region of Ghana in response to the region's educational problems. Programme was established by the Ghana Developing Communities Association (GDCA), a civil society organization based in Northern Ghana, and a Danish NGO (the Ghana Friendship Groups in Denmark)[3]. Their programme is a complementary educational project aimed at out-of-school children aged 8 to 14. According to Casely-Hayford and Ghartey (2007) the programme provides a nine-month literacy cycle in the child's mother tongue to help them gain basic literacy skills and then integrate into the

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[3] SFL has since then been implementing the projects funded by USAAID, DFID or UNICEF (SFL, 2022)

formal education system. They noted that the SFL programme began in 1995 as a pilot project in two Northern Region Districts, with 50 classes in each district, to provide functional literacy to out-of-school children in rural areas, and that this attempt was successful.

The activities of SFL supplement the activities of other actors in functional literacy education, such as NFE, Action Aid Ghana (AAG) or World Vision Ghana (WVG), in order to increase literacy levels in the Northern Region in particular and Ghana in general.

SFL begins its work by organizing animation meetings with communities that have been identified as potential beneficiaries of the programme. SFL makes a significant commitment that its education programme will not interfere with essential family household and community economic activities in which children play an important role. In this context, child labor is regarded as a social and economic necessity rather than as an impediment to education.

NGOs, naturally can only guarantee funding for the duration of the project and cannot be relied on to support local initiatives indefinitely. As a result, once the initiative has been firmly embraced and local counterpart commitment has been secured, long-term financial sustainability must be derived from already existing local structures. (SFL, 2022)

Although SFL has had beneficial links with some municipality education authorities in order to mainstream its students into the formal school system. According to Plomp&Thijs (2003), it has not entered into any formal working arrangements that would allow them to share experiences and help develop local institutional capacity to sustain what had been started.

Again, evidence from the SFL (2022) programme suggests that in order to sustain self-help efforts at the local community level, aid-assisted programmes must demonstrate sufficient success to inspire deep commitment and a sense of ownership. It appears that the best way to persuade poor people living in impoverished and harsh conditions to invest their time and resources in basic education in their community is for the initiative to produce tangible results, such as evidence of children progressing to higher levels of education. In the case of SFL, this appears to have created an incentive for community commitment to education, leading some of these communities to take steps, with the assistance of local government, to build schools for SFL graduates to attend.

This means that although it is helping to improve access and participation to basic education for all children, the alternative approach had not become part of the wider system plan of delivering basic education, and by implication, could not benefit from any local funding arrangement for supporting schools. In effect the programme was simply supplementing the formal system, thus doing little to

encourage local governments to become more responsible for improving and maintaining the quality of their own system (Plomp & Thijs 2003)

During the previous years (till 2021), the program grew to more than ten districts, helping over 50,000 children. The activities of SFL complement the activities of other actors in functional literacy education, in order to increase literacy levels in the Northern Region in particular and Ghana in general.

Action Aid Ghana (AAG)

AAG is another international (British) NGO that began operations in Ghana in 1990 and has since worked with 279 communities in the Upper regions, Northern, Brong Ahafo, Volta, and Accra. AAG invests heavily in education, focusing on securing girls' and women's right to education, providing access to excluded groups, and providing adequate educational resources, including functional literacy (NFE, 2022). AAG collaborates with NFE and other organizations to provide literacy to vulnerable groups through its Shepherd School system. The Shepherd School programme was launched in Ghana's seven pastoral communities in 1996. (Mfum-Mensah, 2002).

The Shepherd Schools programme principle is not only locally appropriate, but is characterized by its cost-effective, and accessible to disadvantaged children, but also flexible in order to synchronize children's needs and sociocultural responsibilities with parents' educational responsibilities (Mfum-Mensah, 2002). The programme's objectives, according to the author, are three:

- to provide basic functional education to at least 30% of children living in target communities who do not have or have not had access to formal school, or who have dropped out of school
- to provide a unique opportunity for children to effectively bride up to the formal school system
- to offer opportunities to children who will return to the community after Shepherd School with basic literacy an opportunity.

Amako (2011) in his evaluation of this programme found out that under the AAG programme was build more than 20 school buildings in Tamale and near surrounding namely Tolon-Kumbungu[4] for functional literacy classes.

Jolly Phonics programme (JPP)

JPP (2022) programme differs since it has now been in use since 1995 and has been endorsed for use in all schools in countries such as the Gambia and Trinidad and Tobago, as well as recommended by governments in some other countries (ex. Nigeria).

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[4] The school in Tolon-Kumbungu that was built by AAG is one of the schools currently involved in the RLS programmeme, which will be analyzed in more detail below.

The letter sounds of English are first taught to students using Jolly Phonics. They are then learning how to blend those sounds to read words (for example, c-u-p makes cup). The spoken word cup is thus created, or synthesized (hence synthetic' phonics). It teaches children how to read new words for themselves. It also allows them to write words by breaking them down into sounds and then writing the letters for those sounds. The letter sounds are taught alongside culturally relevant stories, songs, and actions that make learning the sounds memorable and enjoyable. This is exactly the same procedure used by RLS. (Universal Learning Solutions, 2013)

For the purpose of the impact evaluation, which I carried out on the RLS programme I have been inspired by the evaluation assessment of the JFP that took place in 2013. Although JPP operates in 250 schools across Ghana, their evaluation process was adapted to the conditions of the RLS principals mainly because of the similarity (almost identical) of their curriculum.

As JPP (2022) at the time of the evaluation (2013) was taught in 250 government schools, research was conducted across a range of districts and types of schools using the programme. As the experimental schools' evaluators used those who had received training by JPP and had the JPP materials and teachers used the JPP as part of their literacy lessons. In their case, as a control group schools without JPP program were used, and data were provided by Ghana Education Service (Universal Learning Solutions, 2013). Because the RLS program is smaller in scope and does not always cover all students in a school, it made more sense to use students who were not enrolled in the program as a control group. More on this is explained below in a methodology section.

The literacy tests combined elements from the Early Grade Reading Assessment[5] (EGRA) and the Burt Reading test. Students were tested, with the following literacy skills assessed:

- Letter sounds
- Whole world reading
- Sentence reading
- Word writing
- Listening

The evaluation of the RLS focuses only on three categories listed above (letter sounds, whole word reading, and word writing). Originally, I intended to include all categories as JFF, however, during piloting phase, this approach proved very time-consuming. RLS students had trouble reading the sentence during the piloting and it always took several minutes. Since the research sample was

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[5] *"The Early Grade Reading Assessment (EGRA) is an oral student assessment designed to measure the most basic foundation skills for literacy acquisition in the early grades i.e., recognizing letters of the alphabet, reading simple words, understanding sentences and paragraphs, and listening with comprehension."* (USAID, 2022)

targeted to contain over 200 students, I finally decided not to include this category in the evaluation and leave room for further research. Regarding the category 'Listening' I was struggling with technical problems as there was often no electricity at the school site.

JPP evaluation contains also context interview. Those were held with each student to determine age, gender, poverty indicators, home language(s), whether English is spoken at home, and program experience. The RLS evaluation also includes the following information except for poverty indicators.

This JPP evaluation determined that the synthetic phonics approach to teaching reading and writing in English, specifically the JPP, results in greater progress in the pupils' reading and writing ability in English than those students who are not taught using the program. This evaluation also revealed that the JPP is beneficial to all student groups (gender and language spoken at home). Despite the fact that this program is designed to teach children to read and write in English, feedback from teachers and district education officials indicates that the Jolly Phonics program can also be used to effectively teach children to read and write in their native language.

The program was identified to have increased levels of enthusiasm in the teaching and learning of literacy among students, teachers, and parents, which resulted in increased attendance and even enrollment at schools that used the program, as well as students extending their learning beyond the classroom.

Furthermore, there have been several substantial problems in this project, which are likely to have hampered the program's impact in the pilot schools. Because of the initial absence of Jolly Phonics training, as well as the lack of rigorous monitoring and follow-up at the pilot schools, instructors only have a rudimentary understanding of the curriculum. Using the JPP in addition to the current literacy programs in all government schools, such as NALAP and the Integrated Approach to Literacy, also caused confusion for teachers (Universal Learning Solutions, 2013). Considering this output from the JPP evaluation, the RLS assessment was extended to include also feedback from teachers.

5. Rural Literacy Solutions (RLS)

RLS is a Community-based NGO in Tamale, Northern Region. It is an organization, that offers non-compulsory and an extra-curricula education. This community based organization is a practical response to the diagnosed high rate of illiteracy in Ghana (see Table 2 above), especially in the rural areas of the Northern areas of the country. RLS is trying to reduce this inequality between males and females so they pay special attention to girls. The main mission of RLS is to aid rural development in Ghana through education by helping rural students to develop literacy skills in reading, writing and numeracy. The programme provides extra literacy classes at state schools, which are taught by RLS's trained teachers.

Teaching rural children the skills to become successful in life is at the core of RLS programme.

The major components of the programme are:

1. Cognitive Skills; this is at the heart of RLS, so under cognitive skills, the students are taught how to Read, Write and to Compute.

2. Communication Skills; RLS is keen about helping the primary beneficiaries of the programme to gain confidence in verbally communicating, this is meant to encourage social development.

3. Motivation to use the library; this is a self-help programme to promote lifelong learning. Currently, RLS is running a reading clinic with five basic schools in rural societies around Kumbungu district. This reading clinic's activity is non-compulsory and it is formed to help rural students gain adequate literacy skills and to increase the opportunity to learn.

The main objectives include:

1. Providing a measurable school literacy activities and tuition, that beneficiaries may not get during normal school hours to help them to read and to write successfully by the end of the academic year.

2. Enabling poor readers to understand the six basic literacy skills in the first half of the programme. For the first half, Rural Literacy places much emphasis on literacy activities and tuition that will help student understand the six literacy skills:

- Print Motivation - being interested in and enjoying books

- Print Awareness - noticing print, how to handle a book, how to follow words on a page
- Letter Knowledge - knowing letters are different from each other, knowing their names and sounds
- Vocabulary – knowing the names of things
- Phonological Awareness - being able to hear and play with the smaller sounds in words
- Narrative skills - being able to describe things and events and tell stories

In the second half, beneficiaries should be applying all the literacy skills learned in reading books at their various grade levels effectively.

The RLS curriculum is taught in partner state schools by trained teachers. As the share of trained teachers in primary education in Ghana is 62% of total teachers (World Bank, 2021). RLS also organizes the literacy training session for their teachers. RLS facilitators have taken an active role in the homework area, working individually with the students using current homework assignments. They also read-out with the students and give quizzes on tapes and videos to improve comprehension. Incentives are awarded to the participants based on attendance, good behavior and general attitude.

Currently RLS have five partner schools namely Tolon-Kumbungu, Bong-nawili, two schools in Kumbungu, and one school with only a weekend programme in Tamale. With a total of 290 (55% females) students (2021) benefiting from the services rendered to them. Virtually all participants qualify for the government free lunch programme and are considered low-income. With the determination to expand the capacity to serve five more schools. Organization is also planning to be targeting the Fulani (the Nomads) tribes in rural communities in the near future.

The next part of this thesis is based on the field research within which the impact evaluation of RLS programme was carried out. Evaluation below tries to answer whether RLS is succeeding in improving pupils' skills in letter sound, reading and writing.

II. Research

6. Purpose and objectives of the research

The intention of the research is to find out how the Rural Literacy Solutions programme has achieved its goal after two years of existence. RLS' purpose is to help rural pupils gain literacy abilities in spelling, reading, and writing in order to aid rural development in Ghana.

The main objective of the research is to evaluate the functioning of the project in the rural context of the Northern Districts of Ghana, and its impact on the target group. In addition to the students, the teachers of the RLS programme are also involved in the research. In this case, the survey aims to get feedback on the programme from teacher's side.

The research was conducted as an evaluation case study and is based primarily on field data collection and quantitative data analysis in the case of pupils and qualitative data analysis in the case of teachers.

7. Methodology

The assessment of the impact of the RLS programme on pupils' literacy levels was focused on third to sixth grade of primary school to provide a cross section of the age groups using the programme. The evaluation was conducted at five of schools using the programme.

Research tool place at the schools where the teachers had received training in RLS and had the RLS materials. Those are experimental schools, teachers used the RLS programme as part of their literacy lessons. Classes at the same schools, which are not using the RLS programme, will serve us as a control group, the teachers are wholly using the literacy programme provided by Ghana Education Service (GES).

The methodology of this research is inspired by an evaluation conducted by Universal Learning Solutions (ULS) in their evaluation of Jolly Phonics programme which has been piloted in the teaching of reading and writing of English in government primary schools in Ghana.

The literacy assessments used combined some elements of the Early Grade Reading Assessment and Burt Reading test. EGRA is a research-based toolkit produced by the United States Agency for International Development. It is designed to measure some of the foundational literacy skills that readers need for reading acquisition in alphabetic languages. EGRA is a collection of subtasks, each with a specific purpose. As written in the EGRA (2016) this evaluation method can be used as a system-level progress monitoring tool or for programme evaluation purposes. Burt Word Reading test consists of a list of 110 words arranged in groups of ten, and presented in increasing order of difficulty. The idea is starting with the easiest words, and becoming more difficult as you go down the page. However, for the purpose of this research, only the basic idea of this model was used. The reading words were selected from the RLS textbook and there were fewer of them due to the number of respondents and therefore time consumption.

This research was developed as a case evaluation study, which is a detailed study of one case - the project under study. The research evaluates a given project based on predetermined criteria and works with a theory that is based on the assertions on which the project is presented to the public. The research questions directly seek to answer criteria of efficiency/effectiveness and impact.

According to Kremer (2009), assessing the impact of aid, particularly the relationship between aid and broader outcomes, faces three particular challenges: data problems, attribution problems, and the difficulty of finding a reliable *counterfactual*. What this means is a 'what-if' method through which we seek to answer the question of what the situation would have been like if there had been no aid. This

can be done either by an experimental comparative method or by examining the situation before and after.

For this reason, the research methodology chosen was a quasi-experimental model of evaluation. Within its framework, two groups of people are compared. a group of beneficiaries, *the experimental group*, with a group of people who did not receive assistance under the project, *the control group*, in order to demonstrate the benefits of the project for the beneficiaries. These two groups have at most the same characteristics and initial starting conditions. Subsequently, the differences between them are evaluated with regard to other possible variables that may have influenced their development.

7.1. Data collection methods

Data collection consisted mainly of a search of available programme documentation, curriculums and visits to project areas where I conducted structured and semi-structured interviews, questionnaire surveys and observations with current beneficiaries and their programme teachers.

7.2 Interviews

Interviews can be qualitative or quantitative. Qualitative interviews, according to Diamond (2009), tend to be conversations that go into the depth of an issue, give space for discovering new contexts, and their results are usually interpreted in a narrative form, summarizing the most common views, even marginal ones. Interviews can provide very detailed information. They allow personal contact with respondents, give the researcher the opportunity to explain and clarify questions, and provide a space for in-depth exploration of the topic. Quantitative interviews, on the other hand, are strongly structured and the answers are analyzed statistically.

Henerson (1987) has very similar view. According to him, the researcher can recognize whether the respondent is able to comment on the question or not. The researcher can also obtain new unexpected information from the respondent. This was also confirmed many times in my field research, where several interesting information came out in the interviews that does not appear in written questionnaires. The interviews also have the advantage in cases of illiteracy of the respondents. Some of the respondent representatives participating in the research belonged to the illiterate group, which was partly the case for some of the children who are in the RLS programme. The interview was the only possible form of obtaining any data from them. Henerson (1987) also takes into account the disadvantages of oral communication/interviews are the time-consuming nature and the influence of the researcher's presence on the respondent (fear in a formal meeting, uncertainty about why he is being interviewed, what he should say, how his answers will be interpreted). The researcher is, in a sense, an evaluative instrument himself and is very likely to influence how respondents answer by his presence and interaction with them. To make the interviewees, specifically the pupils I interviewed,

feel as comfortable with me as possible, I spent several weeks with them before the actual interview. During the observation phase, I spent plenty of time in their classroom plus I even taught some of the RLS programme as well. This helped me to gain the trust of the pupils, which helped the interviews run smoothly.

At the initial stage of my research, the plan was to use some form of questionnaire to obtain data relating to pupils. However, when piloting it, I found that it was very difficult for the pupils to complete any form. So in the end I chose the path of interviews, which although took more time, but I think it was still worth it and I managed to get some valuable data.

The interviews with the pupils always took place in the school during lessons. I interviewed the pupils one by one and we were in a separate room only two of us. All interviews were recorded on a mobile phone.

7.3 Questionnaire

Another method I used for data collection was questionnaires. Questionnaires, were mainly used to collect data from the teachers of the RLS programme. Through the questionnaires I mainly collected basic personal information about the teachers I also let them evaluate the programme from their perspective. I was interested in the training they have received at the beginning. I let the teachers rate the length of the training, the programme explanation and the study material. It was also important to me whether the teachers feel sufficient support provided by the organization. I also asked about their overall impression and possible recommendations for RLS.

In terms of how the questionnaires were handled. First, I had the teachers fill in the questionnaire so that they had sufficient time to reflect on the questions and then I went through their answers with them and asked for details. I chose this approach because, according to Henerson (1987), the positive side of questionnaires is that they give the respondent sufficient time and space to think about the answers and thus increase the probability of truthfulness. On the other hand, the downside is that questionnaires do not offer the flexibility that an interview does. There is also a risk of how respondents will interpret the question plus Diamond (2009) pointing out the disadvantage that cannot be clarified to respondents if necessary.

I consulted the questions in the questionnaire beforehand, both with my thesis supervisor and with the director of the RLS organization. The questionnaire was not piloted, but they were rephrased based on the feedback of my supervisor and the director.

7.4 Observation

Patton (1987) counts among the main advantages of the observation understanding of the context in which the project activities take place and also phenomena that are no longer perceived by the respondents and therefore cannot be reported, but which may play an important role. Each respondent gives an account from his or her own point of view. Although the results of the observations are strongly influenced by the personality and experience of the researcher, they can still create a more complete picture of the project under study. I recorded any observations directly in the field in the form of notes in my field diary. I wrote down keywords, short phrases, thoughts, etc. The recording was done alongside with the research between February and May in 2021.

Hendl (2005) divides observation into following categories

- Hidden - open: participants are informed that the observation takes place
- Participatory - non-participatory: according to the observer's participation in the event
- Structured - unstructured: according to whether the observer has predefined categories of observed phenomena

My observation phase took place at several levels

1. I visited successively all schools (5) where the RLS programme is being taught
2. I always stayed together with the community, for at least two weeks, around the school, where (not only the pupils) were living
3. I tried to teach at least 3 classes of RLS programme at every school
4. I attended meetings organized by the RLS

It means I have been introduced to all the respondents since the beginning of the research. Respondents were therefore informed about the research process and their active participation in it, so it was an open observation. However, respondents were not familiar about the different data collection methods used. Therefore, the observations may have been partially hidden. As the observation served primarily as a preparatory phase for research and overall understanding of the local context no comprehensive table with categories of observed behaviors was created, but I recorded all findings in a research journal.

7.5 Areas of data collection

The general geographical area where the RLS programme is taught is located in the rural areas in the Northern Part of Ghana. Specifically, there were five schools at the time of the research. The main office of RLS is located in Tamale (see Figure 1), which is the capital city of the Northern Region of Ghana. There is only one school in the town of Tamale that is involved in the programme, which runs

a special weekend classes. However, other involved schools are located in even less developed areas. Specifically the town of Kumbungu (see Figure 1), where two schools are located. The other two schools are, about 20km from Kumbungu, one is in Tolon-Kumbungu district, and another one is called Bong-nawili, but it is not traceable on any of the available maps. The attached map shows only the approximate location. The areas are discussed in more detail in Chapter 8.1. Geographical background.

Figure 1: Areas of data collection
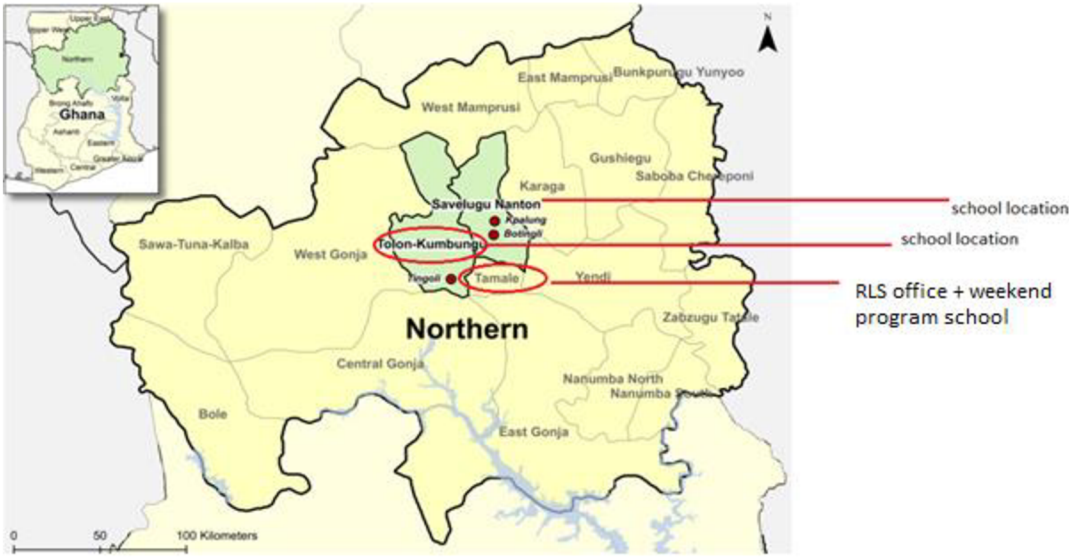
(Source: Kuivanen et col., 2016)

7.6 Research sample

The research sample (respondents) was selected purposively, according to the needs of the research. The experimental group are pupils who are part of the RLS programme. On the contrary, the control group are pupils who are not part of RLS programme, but attend the same school and are in the same year group. However, control group is taught by a teacher who has not been trained by RLS, and does not cooperate with the organization in any way. The number of respondents for each group is determined by the opportunities I had at the time and the need for the purpose of the research. From the pupils' responses, I wanted to carry out a quantitative analysis of the interview results in order to trace a more general trend or conclusion about the impact of the project. In the case of the teachers, what was important for me were the testimonies of the individuals, their perception and evaluation of the programme, or their personal story.

According to Diamond (2009, pp. 39-40), research participants should always be sufficiently informed about the evaluation, so that they can make an informed decision about whether or not to participate. Respondents were informed at the outset about the intentions of my research, my independence, the

organization's permission to conduct the evaluation, and their right to decide freely whether or not to participate.

An informed consent form was signed with all teachers in the research, where I also communicated that they did not have to respond to questions that make them uncomfortable and that they are protected by anonymity. As for the pupils as respondents, everything was discussed verbally at the beginning of the meeting. All respondents agreed to participate in the research, no one was forced to cooperate.

As I am using the real name of the organization under which the programme is taught in the schools, it is impossible to completely conceal the identity of their teachers. However, I consider it important to maintain the anonymity of the pupil respondents. Furthermore, nowhere do I mention any real names of the persons involved in the research.

The Table 3 below shows four main groups of respondents on which the research is based on.

Table 3: Respondents by group

Group of respondents	Number of individuals	Individual Respondents	Code of the respondent	Method data collection method
RLS staff	2	executive director programme manager	ED, PM	observation, interview
RLS programme teachers	6	teachers of the programme in 6 different schools	T1-T6	questionnaire, semi-structured interview
RLS programme pupils	200	pupils at 6 schools	P1-P198	structured interview
control group of pupils	79	pupils at 6 schools	CG1-CG98	structured interview

7.6.1 RLS teachers

To get a more comprehensive picture of the functioning of the project, it was also intended to involve RLS programme teachers in the research. This in practice meant all teachers who, at the time of the research, had received RLS training to teach were included in the research. Each of the trained teachers work in one of the five schools. Everyone teaches the programme in a different environment and therefore brings their own unique insights. In general, I asked about their experience (see Annex 1) with the project and their opinion on the usefulness for pupils. The results of the interviews are continuously reflected in the following chapters. The Table 4 shows all teachers who were interviewed.

I was introduced to the teachers by RLS organization when I have arrived to the school location to conduct this research. During my stay, I got to know the teachers and I also attended their classes

where the RLS programme was taught. I gained the trust of the teachers and the interviews subsequently went without a problem.

Table 4: RLS Teachers

RLS teachers						
school location	sex	age	highest education	teaching experience -general	teaching RLS (years)	classes of RLS program last week (each class)
Tolon-Kumbungu	M	34	high school	12	1	2
Kumbungu (P3, P4)	M	31	bachelor	6	3	6
Kumbungu (P5, P6)	M	29	bachelor	4	2	6
Bong-nawili	M	33	high school	10	1	3
Kumbungu 2	M	28	bachelor	3	2	5
Tamale(weekend program)	F	23	high school	1	1	2

7.6.2 RLS programme pupils

Respondents for the "RLS pupils" group (P1 – P198) were pupils involved in the programme since at least the beginning of the school year. The structured interviews took place in April, which means that the pupils had been in the programme for at least 8 months. The gender of the students was not taken into account, I was interested in both groups. During the interviews, I primarily rated the level of achievement of the students in the three categories that the RLS programme focuses on. These *are letter sound, reading, and writing*. Pupils in each category could achieve a score of 0-5, with the best possible score being five.

My aim has always been to include all RLS pupils who were present at the time of my research. Therefore, I also spent a longer time in the field to have the chance to interview as many pupils as possible. Thus, the experimental group of pupils always includes all pupils (at the time of the research)[6] in the RLS programme at a given school. The final number of respondents is therefore based on their actual availability at the time of my visit to the area. The list of questions asked during the fieldwork can be found in Annex 3. The responses to the questions are sorted by area into tables in Annexes 4. These data are also included in Chapter 8.

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[6] School attendance in these geographical conditions is always dependent on the season. Generally, in the dry season (in which the research was conducted), school attendance is higher. However, with the arrival of the rainy season, work begins in the fields (agriculture), on which most families depend. Thus, there is a need for more work in the fields, it also applies to children; their school attendance is therefore much lower during this period.

The pupils were divided into several groups according to two categories – school and class (grade). In total, I interviewed 198 pupils: 41 in Tolon-Kumbungu, 87 in Kumbungu, 17 in Bong-Nawili, 20 in Kumbungu 2, 33 in Tamale.

7.6.3 Control group of pupils

As one method of triangulation for this research, I used a control group. Which let me set the standard to which comparisons are made in an experiment group. Using the data collected from this group I will be able to demonstrate the phenomena of the RLS programme. The control group was asked the same questions as the experimental group. Thus, the aim was again to rate their level in the above-mentioned categories (letter sound, reading, and writing).

The control group are students who attend the same school and are in the same grade, but the difference is that they are not part of the RLS programme. Bešić and Milenković (2019) state, that this design provides probably the best possible choice since the locality where the pupils of both groups live makes them equable in many social and economic aspects, which significantly protects the research outcomes from getting into fallacy. The issue of the possible problems of comparison between the two groups is particularly challenging. It cannot be assumed that even the spatial proximity some crucial differences between the two groups can be found. During the observation phase, I focused specifically on whether I could detect any possible statistically significant variables that could bias the research findings.

During my observation phase, I have not noticed any statistically significant differences between the two groups regarding their gender and age or social background. There are still two things, which do differ. The gender distribution in the classes. This is due to the fact the RLS programme aims to give preference to girls, who generally have lower school attendance (Ghana Statistical Service, 2021). In classes outside the RLS programme, boys then predominate. The second thing is the total number of pupils in our 'control classes'.

These classes contain often even less than half the number of pupils, it made challenging to collect data of these pupils. However, if we consider that I always spent several days in the field, just to collect as many respondents as possible. I therefore interviewed all the children who were available at the time of my stay.

The problem was not that there were fewer children in the 'control classes' overall. Even in the 'control classes', there was officially enrolled about the same number of children as in the experimental classes. The difference was in school attendance was noticeable this may be related to a phenomenon I have observed during the observation phase. I noticed a much greater motivation to learn in the RLS students than in the control group.

After a longer stay in the field, I finally managed to get at least half of the respondents in the control group for each experimental group.

7.7 Data analysis

For the data analysis, I used partly qualitative analysis to get feedbacks from the teachers and partly quantitative analysis to assess the level of knowledge of the RLS' students. The main advantage of qualitative analysis in the context of this particular research is the space it gives both the researcher and the research participants, in our case teachers. In particular, I used open-ended questions to offer some time to express their opinion. Patton (1987) sympathizes with it as this offers the opportunity to go into the depth of the problem and we can open up new, unsuspected dimensions of the phenomenon under investigation. This allows the researcher to code certain observed phenomena into tables and obtain data for quantitive analysis at the same time. This is how I mainly proceeded with the data analysis in this research. I interpreted teachers' data as narratives, direct quotes, and stories (interview data T1-T6). Pupil's data, due to their amount and the need to obtain a comprehensive result, I coded into tables (P1-P200, CG1-CG79), that allowed me to use quantitative methods to represent the results.

To analyse the data, two softwares, Stata and RStudio, were used, for better clarity, the data were sometimes displayed in Excel. I used RStudio to calculate the Kruskal-Wallis test to determine if there were differences in RLS student performance among schools. Stata was then used for Poisson regression and Margins.

7.8 Validity of the research

Validity is an epistemic criterion: the claim that the results of social scientific research are valid means that the results are in fact true and certain. Čermák a Štěpánková (1997) claim the validity of the research depends on how truthfully the research represents the phenomenon under investigation and how convincingly it illustrates it.

Validity is a key characteristic of qualitative research, without which the research itself and its conclusions are meaningless. Credibility, trustworthiness, transferability, reliability and confirmability (Lincoln in Creswell, 2007, p. 246) are the cornerstones of any research and a prerequisite for demonstrating its validity. Creswell (2007) sees validity in qualitative research as a means of ensuring the accuracy of findings, as best expressed by respondents and researcher.

There are several parameters to ensure the validity of the research. Since, according to Creswell (2007), each research report is the author's own view of the case, and since there are many types of qualitative validity, each researcher must choose the one that best fits the research.

Considering the strategies offered by Creswell (2007) for achieving research validity, I chose triangulation of data, extended time in the field, proximity of the researcher to research participants clarification of researcher bias, and detailed description of context and methodology.

The researcher triangulates information and secures the validity of his results by gathering evidence from multiple data sources to support a given finding. In this research this was insured by the control group.

7.9 Ethics of the research

As was mentioned above, I was involved in the work with RLS for about three months during my research work. The daily contact with all participants in the research and also in the same environment/community create my personal opinion on the situation there. Under these circumstances, it is hard to stay objective. Becker (1967) argues, when we do a research, it is useless to try avoid taking a side, simply because we surely will.

As a researcher coming from outside, I have certainly had a personal relation with people from RLS, also with the teachers of the RLS programme. Pupils, who represent the majority of my interviewees, knew me not only from school but also from the neighborhood since I have lived with the community it helped to interact with kids even outside of school. Furthermore, I am convinced, if it affected the results of this research, it would be rather positive.

7.10 Limits of research

The limitations of this research, in my opinion, are the following:

Language and cultural barrier

Researcher's native language is Czech, which can produce some additional confusion and difficulties. In the areas where the research was conducted the people in the community and specially the children did not even speak proper English (the official language in Ghana) but the local dialect. This made communication challenging and there was a language barrier between the researcher and the local community. Another aspect is that I was often the first foreigner the respondents met and at least at the beginning I felt a lot of mistrust on their side. I partly tried to solve this issue by staying longer in the field.

Researcher's knowledge of evaluation

According to Dudovskiy (2016) literature review is definitely an important part of any research, it helps to identify the scope of works that have been done so far in research area. Literature review findings are used as the basis for the researcher to be built upon to achieve her research objectives. However,

in terms of field research, it was difficult for me as a researcher to prepare for the reality in the field. As this thesis is my first evaluation, I was learning and doing a lot of things for the first time. On the other hand, I had the support and opportunity to consult with my thesis supervisor, who is experienced and was able to help with the research.

Limited Access to Information

RLS is an organization that has only been operating for two years. Moreover, it has been operating in special mode for about a year, as the schools have been running only on a limited basis due to the Covid-19 epidemic. Their practices are not yet very standardized and the programme curriculum is still evolving. At the beginning of my research I lacked the documents on which RLS is based, so I only found out the overall context of their work after my arrival in the field. On the other hand, the research has been directly adapted to the local context and is based on a real need/situation.

Sample size

As mentioned above the number of respondents for the control group was limiting. The control groups are half the size of the experimental group.

8. Application of research in the field

This chapter describes the context in which the research was conducted. I begin by discussing the setting's geographical and socioeconomic aspects, followed by the study procedure and field application of research methods. In the second part will be discussed the outcomes of the research investigation - that is, the functioning of the organizations that set up the programme under study and the functioning of the programme in particular study areas (schools) and overall.

8.1 Geographical background

As mentioned earlier, the areas that were surveyed in this research (Tamale, Kumbungu and Tolon and Bong-nawili, see Figure 1) are all schools where RLS teaches its programme. The purpose, therefore, is to assess, the overall functioning of the programme in its full breadth, i.e. in all schools. The field research took place in one phase, from February to May 2021.

Ghana switched from a local authority to a district assembly system of government in 1988. In that year, the 140 local authorities that existed at the time were divided into 110 districts. There were 28 new districts created in 2004, bringing the total number of districts in the country to 138. Another 32 new districts were established in 2008, bringing the overall number of districts to 170. These 170 administrative districts participated in the 2010 Population and Housing Census. Since then, 46 new districts have been added, bringing the total number of districts to 216 (2022).

To put the research in context, I will now describe the two main geographical areas in which the RLS programme is implemented.

Kumbungu

Kumbungu is the capital of the Northern Region's Kumbungu District. The overall population of the town according to Ghana Statistical Service. (2021). was 41,392 in 2020, with a nearly equal ratio of males to females. The terrain is mostly undulating, with a few depressions here and there. There are no noticeable high points in the district. The rainy season in Kumbungu begins in May and lasts until the end of October. The peak season is from July to September, when the district is prone to flooding. The rest of the year is hot and humid. The annual rainfall averages 1000mm. A variety of rivers and streams flow through the district, the most notable of which is the White Volta. Dendrite drainage patterns can be seen in the major rivers and their tributaries. Rivers, dams, pumps and public tap are the main sources of drinking water in Kumbungu, however in the dry season, the majority of these sources dry up. The research took place between February and May when the dry season was just peaking and almost all water sources were depleted. Locals normally did not have access to any

drinking water for several days. Long queues of people would form at the wells waiting for water to be available.

As per GSS (2010a), kerosene lamps (47.1 %), electricity (38.5 %), and flashlight/torch are the three main sources of lighting in housing units. For most houses in the District, wood is the primary source of cooking fuel 96,6 % . Since almost all households depend on wood that is mainly collected by children. During the interviews, teachers repeatedly stated that wood collection has the greatest impact on school attendance especially on girls. I can affirm that during my stay in the field I frequently witnessed girls collecting wood on the adjacent plains instead of going to school.

Literacy in English and Ghanaian language of the population above 11 years old according to Population and Housing Census (2010a) was 75.8 percent. English literacy constitute 15.1 percent and those literate in Ghanaian language represented 8.7 percent. Speaking about the educational context of the Kumbungu district, 63.8 percent of persons aged 3 years and older have never attended school (females 69.6%, males 58.0%).

The district is rural, with the agricultural industry employing the majority of the people. Crop production employs a significant portion of the population. Despite this, the district's agricultural economy is still predominantly subsistence.

Tolon

Tolon is a small town, but at the same time the capital of Tolon district. RLS has a programme in the town of Tolon, which is in the context of Northern Ghana, is considered to be an urban area, and in Bong-nawili- a rural community of this district. The population of the Tolon District according to the Population and Housing Census (2010b), is 72,990 representing about 3 % of the North Region total population. It is a neighboring district to Kumbungu, meaning the geographical conditions and socio-economic context are quite similar.

The majority of the residents of the district are peasants and subsistence farmers who grow on a small scale, making it difficult to sell some of their produce. As a result, the majority of the youth are fleeing to the South in search of jobs that do not exist. A number of income-generating groups have been trained in a variety of disciplines to enable them to engage in small-scale entrepreneurial activities and support their families.

In general, the Tolon District as per District analytical report (2010b) explains that there are two main settlement patterns, a linear, where most communities and houses are located along the White Volta, which is the case for location of the school *Tolon.* Secondly the trunk road between Tolon and the region's capital Tamale; and nucleated, where villages or houses are clustered. The remaining network

is made up of feeder roads that are dusty in the dry season but nearly impassable in the rainy season. During the wet season, however, the northern half of the district (known as Overseas) is cut off from the rest of the district by the White Volta, and canoes become the only mode of transportation. This is the case for the school Bong-nawili. This makes transporting farm produce and other commercial activity extremely challenging, particularly during rainy seasons.

In the Tolon district, around 49% of all families have access to a better supply of drinking water, with the bulk having access in metropolitan areas. Piped water is the most prevalent enhanced source of drinking water for city inhabitants. Approximately 1.7 percent of residences have water piped into their living area, whereas 10.8 percent utilize a public tap. Pipe-borne exterior dwelling water is the most commonly used source of water in metropolitan settings (41.8 %).

On the other hand in rural areas and communities where Bong-nawili school is located less than 1% of families have access to piped water. Families often rely on unprotected wells or springs for their drinking water. This was also reflected by the teacher from Bong-nawili (the school with the lowest school attendance, see Annex 2), who reported that during the dry season, when household food and water sources are poor, girls barely attend school. The Bong-nawili community, also unlike Kumbungu and Tolon, does not have its own market where it is possible to buy/sell food, so people are dependent on traveling or their own stock.

8.2 Research process, application of research methods

In total 296 pupils were tested. Pupils were tested individually, as described in the methodology, in the form of interviews, during which I went through the questionnaire with them.

In the *Letter sound* category, pupils were given five letters to name and tell how to read them correctly. They got one point for each letter they read correctly, which means that it was possible to get a minimum of 0 and a maximum of 5 points.

The words which were selected for reading are from a textbook that is commonly used by all pupils at school in the subject *Reading.* The words are always adapted to the pupil's grade. Pupils again read 5 words one by one, for each word they could get one point.

The third category is *Writing*, which was the most time-consuming. The pupils were dictated five words to write. The scoring system is the same as in the previous two categories, i.e. they could get one point for each word they wrote. For easier analysis of the results, it was always possible to obtain only the whole point.

Table 5 below shows how many pupils were tested at which school and also the number of children tested from the control group. The table lacks information about the school (Tamale) at which the weekend programme takes place. A total of 33 children were tested at this school. However, we do not have a control group for these dates. Therefore, the research will only be folded in to show the results and for possible comparison with the results of children in the RLS programme at other schools.

Table 5: Pupils respondents

	school_loca				
	Bong-nawi	Kumbungu	Kumbungu	Tolon-Kum	Total
control	9	56	12	21	98
experimental	17	87	20	41	165
Total	26	143	32	62	263

In the first phase of data processing, I sought to answer the research question of whether the RLS program has an impact on student achievement in three selected categories (letter sound, writing, and reading). Poisson regression was used to determine the effect of the RLS program on the pupil's results.

8.2.1 Poisson regression

Koletsi et col. (2017) explains Poisson regression as a type of regression analysis that uses a generalized linear model to model count data and contingency tables in statistics. The response variable Y is assumed to have a Poisson distribution, and the logarithm of its predicted value can be modeled by a linear combination of unknown factors in Poisson regression. When used to model contingency tables, a Poisson regression model is also known as a log-linear model.

Using a Poisson model, we will try to find out whether the RLS program has an impact on students' scores compared to the control group

To ensure that our Poisson regression would have a telling result, we first tested whether there is any correlation among our gathered data and also check if we are not at risk of multicollinearity, before proceeding to Poisson regression. As Kim (2019) states in a multiple regression model, which is also a Poisson regression, multicollinearity refers to a high degree of linear intercorrelation between explanatory variables, which leads to inaccurate regression findings.

To put it another way, perfect collinearity exists when one variable determines the other. Multicollinearity is characterized as a relationship that exists between more than two explanatory

variables More than one explanatory variable is determined by the others in multicollinearity. In our case, this would mean a situation when our variables determinate each other.

Strong multicollinearity, as Alin (2010) stated, increases the variance of a regression coefficient. The standard error of the regression coefficient grows as the variance increases (because the standard error is the square root of the variance). As the standard error grows, the regression coefficient's 95 percent confidence interval grows as well. The t-statistic used to assess if the regression coefficient is 0 is similarly affected by the inflated variance. The regression coefficient becomes trivial when the t-statistic value is low. The resulting predictive regression model is unreliable due to the broad confidence interval and insignificant regression coefficient.

Using Stata, we first checked the correlation in our model. In practice, this means we have looked at the correlations between all the variables. We used the *pwcoor* command in the Stata to see the correlation (Table 6 below).

The strength of the linear link between our variables is measured by correlation coefficients. Asuero (2006) explains that a positive relationship is shown by a linear correlation coefficient greater than zero. A negative association is indicated by a value less than zero. Finally, a value of 0 implies that the two variables x and y have no relationship. Taylor (1990) further specifies that the closer the coefficient gets to +-1, regardless of direction, the stronger the existing correlation, implying a more linear relationship between the two variables. The direction or sign of the association has no bearing on its strength. As the table below shows, all our variables are almost uncorrelated. The strongest relationship is between the variable "age" and the variable "grade", which is logical and expected. Variable "grade" means the year of study in which the pupil is studying. In Ghana, primary school is divided into six grades 1-6 (with the first year being the lowest). It is therefore logical that age determines a student's class. As can be seen from the table, despite the fact that our total sample size contains 263 respondents, multicollinearity is not a concern due to the poor correlation between the explanatory variables.

Table 6: Correlation between variables

	writing	experi~l	female	age	grade	englis~e	tolon_~u
writing	1.0000						
experimental	0.3971	1.0000					
female	-0.0788	0.1631	1.0000				
age	0.2062	0.0666	0.0646	1.0000			
grade	0.2123	-0.1165	-0.0043	0.6104	1.0000		
english_at~e	0.1993	0.0677	-0.0419	0.1255	0.1498	1.0000	
tolon_kumb~u	0.1451	-0.0083	-0.0356	-0.0179	0.0872	-0.0040	1.0000
bong_nawili	-0.2119	-0.0099	-0.0759	0.0002	0.0695	-0.1030	-0.1597
kumbungu2	-0.0562	-0.0325	-0.0320	-0.2259	-0.1107	0.0848	-0.1792

	bong_n~i	kumbun~2
bong_nawili	1.0000	
kumbungu2	-0.1080	1.0000

One of the research questions this paper thesis seeks to answer is whether the RLS program has a real impact on student scores in the categories of letter-sound, writing, and reading. To create an overall score of our respondents, we first added up the pupil's results in these three categories. This simple sum got us the total score the pupils have achieved. This sum was further used for Poisson regression.

General explanation of the Poisson regression table

Enclosed Table 7 below shows us the Poisson regression for the total score of the students. First, we will clarify what the specific values in the table mean. I relied on UCLA College (2022) definitions to explain the regression table.

Table 7: Poisson regression, total score

```
Iteration 0:    log pseudolikelihood = -676.88423
Iteration 1:    log pseudolikelihood = -676.88418

Poisson regression                              Number of obs   =        263
                                                Wald chi2(9)    =     238.96
                                                Prob > chi2     =     0.0000
Log pseudolikelihood = -676.88418               Pseudo R2       =     0.1165
```

score	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
experimental	.4062549	.0408312	9.95	0.000	.3262271	.4862826
female	-.1165665	.0403351	-2.89	0.004	-.1956218	-.0375112
age	.011035	.0138258	0.80	0.425	-.016063	.0381331
grade	.1400462	.0263273	5.32	0.000	.0884456	.1916468
english_at_home	.6486892	.2176998	2.98	0.003	.2220054	1.075373
age_x_eng	-.0416394	.0173616	-2.40	0.016	-.0756675	-.0076112
tolon_kumbungu	.1228985	.0362613	3.39	0.001	.0518276	.1939694
bong_nawili	-.2743577	.0913738	-3.00	0.003	-.453447	-.0952684
kumbungu2	.0502139	.0637623	0.79	0.431	-.074758	.1751857
_cons	1.265275	.135189	9.36	0.000	1.00031	1.530241

```
.
. test tolon_kumbungu bong_nawili kumbungu2

 ( 1)   [score]tolon_kumbungu = 0
 ( 2)   [score]bong_nawili = 0
 ( 3)   [score]kumbungu2 = 0

        chi2(  3) =     25.51
      Prob > chi2 =     0.0000



. estat ic
```

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	263	-496.0629	-466.6221	10	953.2442	988.9657

Iteration Log — The log likelihood (LL) at each iteration is listed below. To produce parameter estimates, Poisson regression employs maximum likelihood estimation, which is an iterative technique. This iteration log acts differently when compared to other regression models that use maximum likelihood (e.g., logistic regression). At iteration 0, the LL does not correspond to the likelihood for the empty (or null) model. This is seen when we look at the log LL for the empty model under ll(null) from the estat ic command. The fitted model's LL is reported in the iteration log's latest iteration and under ll(model) from static; note that both values are equal (unlike ll(null) and the log LL

from iteration 0). The LL for the fitted model is then combined with ll(null) to construct the Likelihood ratio chi-square test statistic.

Log Likelihood – This is the fitted model's LL. It's utilized in the Likelihood Ratio (LR) chi-square test to see if all predictor variables' regression coefficients are zero at the same time, as well as in nested model testing.

Number of obs – It is the total number of observations used. If any variables in the model have missing values, it may be less than the number of cases in the dataset. Stata deletes unfinished cases in a listwise manner by default.

Chi2(3), ll(null), and **ll(model)** from **estat ic** – This is the likelihood-ratio test (LR) statistic for the omnibus test that at least one predictor variable regression coefficient in the model is not equal to zero. The number of predictor variables determines the degrees of freedom (the number in parenthesis) of the LR test statistic (3).

Prob > chi2 – This is the chance of having an LR test statistic that is as extreme as, or more so than, the null hypothesis; the null hypothesis states that all regression coefficients are equal to zero at the same time. In other words, if the predictor variables have no influence, this is the likelihood of getting this chi-square test statistic. This p-value is compared to an alpha level, which is commonly set at 0.05 or 0.01 and represents our readiness to accept a Type I error. The LR test's low p-value, p 0.00001, leads us to believe that at least one of the model's regression coefficients is not equal to zero. The variables in the preceding line, chi2, define the parameter of the chi-square distribution used to test the null hypothesis (3).

Pseudo R2 – Also known as McFadden's pseudo-R-squared. Hemmert et col. (2018) explain Pseudo R2 as the log-likelihood (LL) of the estimated model and the LL of the null model are compared using pseudo-R2 metrics based on LL. The intercept is the only parameter in the null model. Pseudo-R2s can then be viewed as a measure of improvement in terms of LL over the null model, and so provide an indication of fit quality.

Coef. – These are the estimated Poisson regression coefficients for the model. Recall that the dependent variable is a count variable and Poisson regression models the log of the expected count as a function of the predictor variables. Poisson regression coefficient can be interpreted as likelihood change compared to baseline, given the other predictor variables in the model are held constant.

Experimental – This is the Poisson regression estimated likelihood for an experimental group (RLS programme pupil's) test score, with a baseline in a control group (pupils without RLS programme). In our case, it means if a student is in the experimental group there is a 40 % likelihood he/she gets a better score.

Female - This is the Poisson regression estimated likelihood for a female in the RLS programme, with a male baseline. The model shows that girls are more likely to have worse scores than boys (both in RLS programme)

Grade - This is the Poisson regression estimated likelihood for a pupil's grade. In this case, the result is intuitive and can be interpreted as, the higher the year, the better the chances of having better results in the RLS program. In this case, the result is intuitive and can be interpreted as the higher the grade, the higher likelihood of having better results in the RLS program.

English_at_home- This Poisson regression gives us a likelihood estimate for the case that students speak English at home. It turns out that pupils who speak English at home are much more likely to do better in the RLS programme.

Age_X_eng – With this linked variable (english_at_home*age) we wanted to check if english_at_home has the same impact on the score in all age categories. It was confirmed that whether children speak English at home is much more significant at younger ages than at older ages.

Tolon_Kumbungu – This Poisson regression gives us a likelihood estimated for the experimental group school Tolon-Kumbungu, a baseline is the school Kumbungu. According to the results RLS pupils in Tolon-Kumbungu are more likely to get a higher score than in Kumbungu.

Bong_nawili- This Poisson regression gives us a likelihood estimated for the experimental group school Bong-nawili, a baseline is the school Kumbungu. For Bong-nawili school, the coefficient is negative which can be interpreted as students at this school are more likely to score worse than students at Kumbungu school.

Kumbungu 2 – This Poisson regression will not be interpreted as P-value indicates this variable not to be statistically significant.

_cons - This is the Poisson regression estimate when all variables in the model are evaluated at zero.

Std. Err. – These are the regression coefficients' standard errors. They're employed in the z test statistic (superscript j) and the regression coefficient's confidence interval (superscript k) calculations.

z and **P>|z|** - These are the test statistic and p-value for the null hypothesis that a single predictor's regression coefficient is zero if the rest of the predictors are included in the model. The ratio of the Coef. to the Std. Err. of the respective predictor is the test statistic z. The z value is distributed according to a conventional normal distribution, and it is used to test against a two-sided alternative hypothesis that the Coef. is not equal to zero. P>|z| is the chance that a given z test statistic is as extreme as, if not more so, than what was observed under the null hypothesis.

It is important to determine whether the data in our model are statistically significant. The statistical significance of your computed coefficient is called significance. Feise (2002) states it's crucial to distinguish between magnitude and importance. It has to do with the accuracy of our estimate. The t-statistic and p-value in the regression output are commonly used to determine significance. We shall only utilize the p-value in our model. It's the 'P>|t|' columns. For us, the p-value is a question of convenience. STATA automatically accounts for the number of degrees of freedom when determining the significance of our coefficient. We have P 0.05 if it is significant at the 95 percent level. P 0.01 indicates that it is significant at the 0.01 level. In our regression above, P < 0.05, so our coefficient is significant at the 95 % level. Another method STATA explains this is through the confidence interval. The coefficient +/- 2 standard deviations is the confidence interval.

We are 95% certain that the true value of the coefficient in the model that produced this data is within this range. Note that zero is never within the confidence interval for most of our variables, which we expect because the P-values are low. In our table we can see there are two variables which are according to mentioned rule insignificant. It is the variable *age*, -for the same reason mentioned above when we looked at the correlation. However, we have insignificant also the variable Kumbungu 2, which is one of the schools where the RLS program is being implemented. As a result, the high P-value indicates it is not possible to determine whether the pupils in the RLS program are more likely to get better/worse scores than the control group at this particular school. P-values confirmed that all variables except *age* and *Kumbung 2* are statistically significant.

[95% Conf. Interval] - Given the other predictors in the model, this is the confidence interval (CI) of an individual Poisson regression coefficient. We'd state that if we had a 95 percent confidence level in a predictor variable, we'd be 95 percent confident that 95 percent of the CIs would include the "real" population Poisson regression coefficient after repeated trials. Coef. (z/2)*(Std.Err.) is the formula, where z/2 is a critical value on the standard normal distribution. Given the other predictors in the model, the CI is analogous to the z test statistic: if the CI contains zero, we will fail to reject the null

hypothesis that a particular regression coefficient is zero. A CI has the advantage of being illustrative; it shows where the "actual" parameter might be as well as the precision of the point estimate.

8.2.2 Margins

Since the Poisson regression can only predict the likelihood and cannot be interpreted as what happens to Y when a particular X changes by one unit (percentage). We also used the margins command, which recalculates the regression coefficients to give marginal effects of a particular variable.

How Stata (2022) explains in its manual predictive margins, adjusted predictions, and recycled forecasts are all terms used to describe what we call margins of responses. Margins of answers are also known as estimated marginal means and least-squares means when applied to balanced data. A margin is a statistic generated using a fitted model over a dataset in which some or all of the covariates are fixed at values other than their true values. For example, the marginal mean (margin of mean) for females after a linear regression fit on males and females is the predicted mean of the dependent variable, where every observation is treated as if it represents a female; thus, those observations that do represent females, as well as those that represent males, are included.

What we call margins of responses are also known as predictive margins, adjusted predictions, and recycled predictions. When applied to balanced data, margins of responses are also called estimated marginal means and least-squares means. A margin is a statistic based on a fitted model calculated over a dataset in which some of or all the covariates are fixed at values different from what they really are. For instance, after a linear regression fit on males and females, the marginal mean (margin of mean) for males is the predicted mean of the dependent variable, where every observation is treated as if it represents a male; thus, those observations that in fact do represent males are included, as well as those observations that represent females. The marginal mean for females would be similarly obtained by treating all observations as if they represented females. In making the calculation, sex is treated as male or female everywhere it appears in the model. To get the predicted score we will use average marginal effect, the effects of factor variables are calculated using discrete first differences. and can be interpreted as follows: The average marginal effect of treatment on the probability of a positive outcome is 4.06 (Table 8).

Table 8: Margins (sample)

	dy/dx	Delta-method Std. Err.	z	P>|z|	[95% Conf. Interval]	
experimental	4.056567	.398865	10.17	0.000	3.274806	4.838328

Table 9: Margins

```
.
. margins, dydx(_all) atmeans

Conditional marginal effects                    Number of obs    =         263
Model VCE      : Robust

Expression    : Predicted number of events, predict()
dy/dx w.r.t. : experimental female age grade english_at_home age_x_eng tolon_kumbungu bong_nawili kumbungu2
at            : experimental    =     .6273764 (mean)
                female          =      .365019 (mean)
                age             =     11.86692 (mean)
                grade           =     4.714829 (mean)
                english_at~e    =     .1939163 (mean)
                age_x_eng       =     2.437262 (mean)
                tolon_kumb~u    =     .2357414 (mean)
                bong_nawili     =     .0988593 (mean)
                kumbungu2       =      .121673 (mean)
```

	dy/dx	Delta-method Std. Err.	z	P>|z|	[95% Conf. Interval]	
experimental	4.056567	.398865	10.17	0.000	3.274806	4.838328
female	-1.163948	.3984319	-2.92	0.003	-1.944861	-.3830362
age	.1101879	.1380594	0.80	0.425	-.1604037	.3807794
grade	1.3984	.2585433	5.41	0.000	.8916647	1.905136
english_at_home	6.477341	2.161559	3.00	0.003	2.240763	10.71392
age_x_eng	-.4157805	.1728141	-2.41	0.016	-.75449	-.0770711
tolon_kumbungu	1.227176	.358843	3.42	0.001	.5238562	1.930495
bong_nawili	-2.739537	.8979468	-3.05	0.002	-4.499481	-.9795939
kumbungu2	.5013992	.6376567	0.79	0.432	-.748385	1.751183

We use the same variables as for Poisson regression. In Table 9 bellow, we look at the predicted student score. At the top of the table bellow are variables at mean values. The *atmeans* option tells margins to fix all other variables at their means. (unlike adjust, this is not the default for margins.). In our case we work with conditional marginal effect, when the response is evaluated at fixed values of all the covariates (Stata, 2022). We are mainly interested in the dy/dx column that predicts a students score. Margins estimate that an RLS pupil will perform 40% better overall in (reading, writing, letter sound) than a child without the programme. It is further estimated that girls score almost 12 % worse than boys. Pupils who speak English at home will be 65% better than pupils who do not speak English at home. In terms of schools, the lowest predicted score is for Bong-nawili, (27% lower than Kumbungu) and the best score is for Tolon-Kumbungu, which is 12% better than Kumbungu. Average is defined as having the mean value for the other independent variables in the model.

We have describe the Poisson regression and Margins with its predicted numbers, for the overall score of the pupils. Next, we will separately look at the categories of reading, writing and letter sound.

9. Research results

9.1 Reading

Let's first look at the variable reading in the table. To begin, we look at the p-value to see if the variables are statistically significant (using the same rule as mentioned above). Age is again out of the game, Kumbungu2 is in this case slightly above 0.05 line as well. In Table 10 we look mainly at the coefficient *experimental* which is 0,607. This means that a student in the RLS program is almost 61% more likely to perform better in reading than a student outside the program. The variable female, is negative here indicating that girls have a greater tendency to score worse than boys. Next we look at the *Coef.* For individual schools *Tolon_kumbungu, Bong_nawili, Kumbungu2* (the fourth school, Kumbungu, serves as a baseline). Of all the schools, Bong-navili with its negative coefficient -0,417 comes out we worst while Tolon-Kumbungu out of all four schools, pupils are the most likely to have the best reading score.

Table 10: Poisson regression - reading

```
Iteration 0:   log pseudolikelihood = -475.02982
Iteration 1:   log pseudolikelihood = -475.02927
Iteration 2:   log pseudolikelihood = -475.02927
```

Poisson regression

Number of obs   =   263
Wald chi2(9)   =   165.87
Prob > chi2   =   0.0000

Log pseudolikelihood = -475.02927

Pseudo R2   =   0.1208

reading	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
experimental	.6074621	.0855947	7.10	0.000	.4396996	.7752247
female	-.2822797	.0987866	-2.86	0.004	-.4758979	-.0886615
age	.025672	.0316202	0.81	0.417	-.0363025	.0876465
grade	.300604	.0627109	4.79	0.000	.177693	.423515
english_at_home	1.298711	.6080099	2.14	0.033	.1070337	2.490389
age_x_eng	-.0872416	.0485622	-1.80	0.072	-.1824219	.0079387
tolon_kumbungu	.3133047	.0910275	3.44	0.001	.134894	.4917154
bong_nawili	-.4174116	.1697751	-2.46	0.014	-.7501646	-.0846585
kumbungu2	.2501236	.1379935	1.81	0.070	-.0203387	.5205858
_cons	-1.342815	.3282827	-4.09	0.000	-1.986238	-.6993932

We also look at the prediction value using Margins. Table 11 displayed the predictive values for students' reading scores. As Williams (2012) explains predictive margins are a nonlinear model generalization of adjusted treatment means. If everyone in the sample had been in group r, the predictive margin for group r represents the average predicted response. The effect of experimental

53

vs. control in an average increase of 1,29 points on the response scale. The difference is highly significant with z-value of 6,76. When we look at the schools the best predicted score comes out of Tolon-Kumbungu, on the other hand negative value are then for the school Bong-nawili. It is also interesting to note how much the score is affected by whether the children speak English at home or not. Pupil who speaks English at home with his/her family will on average score 31% higher in reading than a pupil who does not speak English at home.

Table 11: Margins - reading

```
.
. margins, dydx(_all) atmeans

Conditional marginal effects                        Number of obs   =        263
Model VCE    : Robust

Expression   : Predicted number of events, predict()
dy/dx w.r.t. : experimental female age grade english_at_home age_x_eng tolon_kumbungu bong_nawili kumbungu2
at           : experimental    =     .6273764 (mean)
               female          =      .365019 (mean)
               age             =     11.86692 (mean)
               grade           =     4.714829 (mean)
               english_at~e    =     .1939163 (mean)
               age_x_eng       =     2.437262 (mean)
               tolon_kumb~u    =     .2357414 (mean)
               bong_nawili     =     .0988593 (mean)
               kumbungu2       =      .121673 (mean)
```

	dy/dx	Delta-method Std. Err.	z	P>|z|	[95% Conf. Interval]	
experimental	1.29819	.1921381	6.76	0.000	.9216063	1.674774
female	-.6032519	.2060117	-2.93	0.003	-1.007027	-.1994763
age	.0548629	.067791	0.81	0.418	-.0780049	.1877308
grade	.6424122	.1267024	5.07	0.000	.3940801	.8907443
english_at_home	2.775439	1.293651	2.15	0.032	.2399288	5.310949
age_x_eng	-.1864415	.1035654	-1.80	0.072	-.3894259	.0165429
tolon_kumbungu	.6695546	.1872067	3.58	0.000	.3026362	1.036473
bong_nawili	-.8920383	.3632028	-2.46	0.014	-1.603903	-.1801739
kumbungu2	.534532	.2938763	1.82	0.069	-.041455	1.110519

9.2 Writing

For the variable *Writing*, the trends are at first glance different from the reading variable. We start with Poisson regression again and then look at the prediction values using the *margins* command. It turns out that whether or not students speak English at home is not statistically significant for this specific variable. Overall, the experimental group is likely to score better (0,29) than students without

the program. The p-value for Tolon-Kumbungu and Kumbungu2 schools is also above the 0.05 (Table 12) threshold which can be interpreted to mean that it is impossible to say whether a student's score is affected by whether or not they are enrolled in the RLS program. Bong-nawili is on the borderline of statistical significance and it shows that students at this school are more likely to have lower scores than baseline which is the Kumbungu school.

Table 12: Poisson regression - writing

```
Iteration 0:   log pseudolikelihood = -466.91138
Iteration 1:   log pseudolikelihood = -466.91138

Poisson regression                              Number of obs   =        263
                                                Wald chi2(9)    =     164.37
                                                Prob > chi2     =     0.0000
Log pseudolikelihood = -466.91138               Pseudo R2       =     0.0333
```

writing	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
experimental	.2885197	.0307829	9.37	0.000	.2281863	.3488532
female	-.0847249	.0316327	-2.68	0.007	-.1467239	-.0227259
age	.0045832	.0086912	0.53	0.598	-.0124513	.0216176
grade	.0719739	.0183774	3.92	0.000	.0359548	.107993
english_at_home	.1583754	.1416139	1.12	0.263	-.1191827	.4359335
age_x_eng	-.0070468	.0107622	-0.65	0.513	-.0281403	.0140467
tolon_kumbungu	.0342409	.0237062	1.44	0.149	-.0122224	.0807042
bong_nawili	-.2545972	.0906644	-2.81	0.005	-.432296	-.0768983
kumbungu2	-.0499907	.0511081	-0.98	0.328	-.1501607	.0501793
_cons	.890872	.1093347	8.15	0.000	.67658	1.105164

```
.
. test tolon_kumbungu bong_nawili kumbungu2

 ( 1)   [writing]tolon_kumbungu = 0
 ( 2)   [writing]bong_nawili = 0
 ( 3)   [writing]kumbungu2 = 0

         chi2(  3) =    14.00
       Prob > chi2 =    0.0029
```

When we look at the predictive values (Table 13), it is confirmed that the experimental group will indeed have in general a higher writing score. As far as the data for individual schools are concerned, it appears that the writing variable is not really statistically significant in this research. Bong nawili is statistically significant however the predicted score is in negative units.

55

Table 13: Margins - writing

```
. margins, dydx(_all) atmeans

Conditional marginal effects                      Number of obs   =        263
Model VCE    : Robust

Expression   : Predicted number of events, predict()
dy/dx w.r.t. : experimental female age grade english_at_home age_x_eng tolon_kumbungu bong_nawili kumbungu2
at           : experimental    =     .6273764 (mean)
               female          =      .365019 (mean)
               age             =     11.86692 (mean)
               grade           =     4.714829 (mean)
               english_at~e    =     .1939163 (mean)
               age_x_eng       =     2.437262 (mean)
               tolon_kumb~u    =     .2357414 (mean)
               bong_nawili     =     .0988593 (mean)
               kumbungu2       =      .121673 (mean)
```

	dy/dx	Delta-method Std. Err.	z	P>|z|	[95% Conf. Interval]	
experimental	1.199679	.1248865	9.61	0.000	.9549058	1.444452
female	-.3522901	.1301333	-2.71	0.007	-.6073467	-.0972334
age	.019057	.036085	0.53	0.597	-.0516684	.0897823
grade	.2992709	.0751602	3.98	0.000	.1519596	.4465823
english_at_home	.6585326	.5870011	1.12	0.262	-.4919684	1.809034
age_x_eng	-.0293009	.0446797	-0.66	0.512	-.1168715	.0582697
tolon_kumbungu	.1423754	.0979605	1.45	0.146	-.0496238	.3343745
bong_nawili	-1.058627	.3694034	-2.87	0.004	-1.782645	-.3346099
kumbungu2	-.2078637	.2123721	-0.98	0.328	-.6241054	.208378

9.3 Letter sound

For the letter sound variable, the experimental group is more likely to obtain a higher score from letter sound than the control group. We can see in the Table 14 that the value of the coefficient is high (0.42). Unlike the previous two variables, here we see statistical insignificance in the female row, which means that gender does not affect the letter sound results. Whether or not students speak English at home has a very positive effect on the likelihood of getting a better score (as in reading). As per Table 14 for Tolon-Kumbungu and Bong-nawili schools the results are statistically significant, which is not the case for Kumbungu2. Bong-nawili will again have most likely the worst score (-0.22) while Tolon comes out the best (0,1).

In the margin Table 15, we see a very high predicted value for the experimental group (the highest of the three categories studied). Which means that in letter sound the experimental group has a predicted score 1.5 units higher than the control group. Tolon has the highest prediction score (0.36) while Bong-nawili has the lowest (-0.8).

Table 14: Poisson regression – letter sound

```
Iteration 0:   log pseudolikelihood =  -466.6221
Iteration 1:   log pseudolikelihood =  -466.6221

Poisson regression                              Number of obs    =        263
                                                Wald chi2(9)     =     188.87
                                                Prob > chi2      =     0.0000
Log pseudolikelihood =  -466.6221               Pseudo R2        =     0.0593
```

letter_sound	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
experimental	.4184681	.0452502	9.25	0.000	.3297793	.507157
female	-.05268	.0429442	-1.23	0.220	-.1368492	.0314891
age	.0065698	.0154273	0.43	0.670	-.0236671	.0368067
grade	.127916	.0304347	4.20	0.000	.068265	.1875669
english_at_home	.7783897	.2255452	3.45	0.001	.3363291	1.22045
age_x_eng	-.0507698	.0177961	-2.85	0.004	-.0856495	-.0158902
tolon_kumbungu	.1019478	.0380048	2.68	0.007	.0274597	.176436
bong_nawili	-.2201322	.1026675	-2.14	0.032	-.4213567	-.0189077
kumbungu2	.0418311	.0580878	0.72	0.471	-.0720189	.1556812
_cons	.3244029	.1408613	2.30	0.021	.0483199	.6004859

```
.
. test tolon_kumbungu bong_nawili kumbungu2

 ( 1)  [letter_sound]tolon_kumbungu = 0
 ( 2)  [letter_sound]bong_nawili = 0
 ( 3)  [letter_sound]kumbungu2 = 0

          chi2(  3) =     13.97
        Prob > chi2 =     0.0029
```

Table 15: Margins – letter sound

```
. margins, dydx(_all) atmeans

Conditional marginal effects                    Number of obs    =        263
Model VCE    : Robust

Expression   : Predicted number of events, predict()
dy/dx w.r.t. : experimental female age grade english_at_home age_x_eng tolon_kumbungu bong_nawili kumbungu2
at           : experimental    =     .6273764 (mean)
               female          =      .365019 (mean)
               age             =     11.86692 (mean)
               grade           =     4.714829 (mean)
               english_at~e    =     .1939163 (mean)
               age_x_eng       =     2.437262 (mean)
               tolon_kumb~u    =     .2357414 (mean)
               bong_nawili     =     .0988593 (mean)
               kumbungu2       =      .121673 (mean)
```

	dy/dx	Delta-method Std. Err.	z	P>|z|	[95% Conf. Interval]	
experimental	1.510115	.1570372	9.62	0.000	1.202327	1.817902
female	-.190105	.1544444	-1.23	0.218	-.4928105	.1126005
age	.0237083	.0556569	0.43	0.670	-.0853773	.1327938
grade	.4616069	.1072472	4.30	0.000	.2514061	.6718076
english_at_home	2.808954	.8062394	3.48	0.000	1.228753	4.389154
age_x_eng	-.1832117	.0638297	-2.87	0.004	-.3083155	-.0581078
tolon_kumbungu	.3678964	.1364826	2.70	0.007	.1003953	.6353974
bong_nawili	-.7943851	.3652136	-2.18	0.030	-1.510191	-.0785796
kumbungu2	.1509549	.2095302	0.72	0.471	-.2597168	.5616265

9.4 RLS teachers reflection

As mentioned the teachers of the RLS programme were also involved in the research. The main aim was to get their feedback regarding the RLS programme in the context of the school where they teach. Teacher's inputs are intended to provide a complete view of the results in this evaluation. Furthermore it also serves as suggestions for RLS.

Table 16 summarises teachers' impressions of the programme. The overall impression of the programme is rather positive. The teacher from Bong-nawili gave the lowest rating of "average", it is a school with rather lower pupils score compared to other schools in the programme. Remember that Bong-nawili is in the most rural areas of all the schools, and that absenteeism related to the collecting wood and getting water interferes with school attendance the fact that the school is quite remote also affects the RLS support it receives, which the teacher also reflected in the interview.

In terms of the study material all teachers would appreciate more textbooks, lessons materials and also ideas how to lead the classs. This is also related to program explanation, which Kumbungu2 and Bong-nawili teachers rated as 'average'. Table 16 will be further reflected in the recommendations chapter.

Table 16: Teachers feedback

teachers feedback					
Scale 0-5. (5) Excellent (4) Good (3) Average (2) Below average (1) Poor					
school location	Length of the training	LRS program explanation	study material	after training support	overall feeling
Tolon-Kumbungu	2	5	2	2	4
Kumbungu (P3, P4)	5	5	3	4	5
Kumbungu (P5, P6)	5	5	2	4	4
Bong-nawili	3	3	1	1	3
Kumbungu 2	3	3	2	4	5
Tamale(weekend program)	5	4	3	5	4

One of other interview question was *"Would you skip/add any part of the programme in some grades at your school?"*

All teachers agreed that students have the biggest problem with English conversation, which the programme does not think about. It was also confirmed during the interviews with the pupils. They often know the letters and can read them, but it is almost impossible to have a conversation with them.

The Bong-nawili teacher adds that *Writing* (as a separate subject*)* in higher grades does not make much sense as it is often already well mastered by students. Teachers in general would appreciate greater freedom and flexibility in the programme to tailor it to the individual classroom needs.

Tolon teacher suggests that spelling (letter sound) should not be taught separately, but in the context of reading, which he believes would help students to understand the context better.

9.5 Summary

According to my findings mentioned in the previous chapters, the programme fulfils its objectives in the way of its effectiveness/efficiency (how much the programme has really contributed to improving the literacy level of its students). The LRS programme design and strategy was chosen based on personal knowledge of the environment and context of literacy issues in Northern Ghana. This gives the programme a good chance of achieving maximum effectiveness. Approximately 1500 students have been involved in the programme over last 3 years of its operation (2022). The number of schools and individual teachers still interested in participating in the program is also gradually increasing.

To summarize our findings for all of the three categories - reading, writing, letter sound. Overall, we found that being enrolled in the RLS programme has a significant positive impact on student scores in all categories. However, results vary both by school and also by category.

As for likelihood to get a better score, category *reading* is proving to be the best. The letter sound category (which is a prerequisite for reading) also appears to be very well mastered by the experimental group. Category *writing* also has a positive coefficient, so it is expected that the experimental group will have better results, but in any case the coefficient is much lower compared to reading and letter sound.

Table 17 and 18 below shows the average score of students by school and grade. Table also includes the RLS weekend program, just for comparison. The difference in the scores is noticeable, school Tolon-Kumbungu shows the best scores in all categories. The data are a good demonstration of how misleading it can be without a control group. The table shows that RLS students have the best scores in writing, but as we found using Poisson regression, the effect of RLS is not the largest for this category. The table is therefore used solely to compare scores between schools.

Table 17: Average scores by grade – experimental group

experimental group					
Letter sound					
school	average P3	average P4	average P5	average P6	weekend program
Tolon-Kumbungu		4.27	4.75	5.00	
Kumbungu	3.00	3.89	4.4	4.64	
Bong-nawili		3.56		4.88	
Kumbungu 2		3.92	4.88		
Tamale(weekend program)					4.42
Reading					
school	average P3	average P4	average P5	average P6	
Tolon-Kumbungu		3.18	3.96	3.33	
Kumbungu	0.65	2.60	3.5	2.92	
Bong-nawili		0.44		4.25	
Kumbungu 2		2.67	3.88		
Tamale(weekend program)					3.09
Writing					
school	average P3	average P4	average P5	average P6	
Tolon-Kumbungu		4.91	4.92	5.00	
Kumbungu	3.94	4.49	4.8	4.84	
Bong-nawili		4.11		5.00	
Kumbungu 2		4.08	5		
Tamale(weekend program)					4.21

Table 18: Average scores by grade –control group

control group				
Letter sound				
school	average P3	average P4	average P5	average P6
Tolon-Kumbungu		3.67	3.17	3.00
Kumbungu	2.38	2.55	2.6	3.69
Bong-nawili		0.6		1.25
Kumbungu 2		3.00	3	
Reading				
school	average P3	average P4	average P5	average P6
Tolon-Kumbungu		2.33	1.92	2.33
Kumbungu	0.50	1.00	1.2	2.69
Bong-nawili		0.2		0.75
Kumbungu 2		2.00	1.4	
Writing				
school	average P3	average P4	average P5	average P6
Tolon-Kumbungu		4.17	3.50	4.33
Kumbungu	3.25	3.45	3.6	4.38
Bong-nawili		1		1.75
Kumbungu 2		3.29	3.4	

10. Conclusions

In this final chapter, I summarize the research findings based on the analysis of data from field research (interviews, questionnaire surveys, observations) and an examination of available documentation and literature. I will start answering the research question.

The aim was to evaluate the functioning of the RLS literacy programme in the rural context of the Northern Districts of Ghana, and its impact on the target group.

It has been confirmed that the direct impacts of the programme include helping its pupils to improve their literacy skills. According to the regression results, the RLS programme has a significant positive impact on pupils' reading, writing and spelling scores at all schools. Pupils who participate in the program are up to 40% more likely to achieve higher scores than those who do not, which is quite significant impact. A positive effect (measured by the LRS pupils' scores compared to the control group) was proven in all three examined categories. *Reading* category, has been most successful followed by associated *Letter sound*. The smallest, but still significant, difference between the RLS pupils and the control group is in *Writing*. It turns out that the performance of schools in the programme varies, as does school attendance, which is related to the location of the school and how rural the area is.

In the case of this research, a direct causal relationship between the programme and literacy improvement. Although in my opinion, a slew of other variables/factors play a role here. Those are mainly the geographical location of the school, natural conditions and the socio-economic situation of the area. This other factors may be the subject of further research. In this research has been only confirmed that whether pupils speak English at home or not has an impact on their scores, most significantly in the *Reading* category.

Another aim of this thesis was to collect *RLS teachers' feedback on the programme*.

The teacher's feedback showed that overall satisfaction with the programme is above average, with the exception of one teacher who rated the programme as average. Teachers agree that when it comes to teaching RLS programme, it should always need to be considered who the students are and adjust which programme components make the most sense to teach in a certain classroom.

The greatest gap reported by teachers in the programme is in providing sufficient study material. This applies both to materials where teachers can get inspiration for their lessons, plus workbooks for their students. Half of the teachers would also appreciate a better explanation of the programme. Teachers also suggest including other components in the RLS programme, such as conversation.

11. Recommendations

After the experience with this impact evaluation, I am convinced that independent monitoring or evaluation of this type of program is very necessary. However, insufficient experience and financial resources is a barrier to evaluation for these small local NGOs. Hence my first recommendation to the RLS is to actively seek external evaluation opportunities – for example, partnering with universities. It might lead to unanticipated findings that can improve the programme impact to everyone's delight.

The issue with the lack of monitoring in this case, in my opinion, is primarily the inability of the RLS teachers to provide feedback to the organization and thus contribute to enhancing the program's general functioning. The evaluation's findings have been the organization's very first feedback on their program.

Second recommendation from my side, is reflecting the findings that have been identified from the interviews with the teachers. Teachers agree that the program does not really take into account the conditions in which is being taught. I empathize with the teachers on this. I can imagine for example, that as part of another master's thesis, an interactive education curriculum will be developed (e.g. that may be taught outside while collecting wood).

Another recommendation is related to the focus of the programme. Gaining literacy, by teaching children to read and write, does not necessarily mean that pupils will master the language at a conversational level. As was confirmed during the interviews. From my point of view, the program is very much based on rote memorization rather than stimulating children's thinking and positive motivation to learn. I would therefore add more conversation classes. Together with RLS, we are now reaching out to international organizations and universities that are interested in sending volunteers to teach English. These volunteers could help the children with English conversation and build on what they learn in theory in the RLS programme.

The last recommendation is linked to raising resources for the operation of the programme. Currently, the programme relies only on crowdfunding platforms, where mostly small donors contribute. Given the positive results of this evaluation, that the programme has a real impact on its students achievement, I guess it could be also attractive for larger institutional donors. Obtaining such financial support would help the programme to expand to more schools and train new teachers.

All my suggestion are certainly not addressed as any kind of criticism of the programme. The organization, as the data shows, is doing a great job and I really appreciate their commitment to help improve literacy in the area. Overall, I think the organization is very open to innovation and welcomes

any feedback and further assistance. I kindly encourage other students, who are interested in exploring a similar topic to approach the organization and discuss possible cooperation.

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Interviews

Interview with RLS pupil	P1	18.3.2021
Interview with RLS pupil	P2	18.3.2021
Interview with RLS pupil	P3	18.3.2021
Interview with RLS pupil	P4	18.3.2021
Interview with RLS pupil	P5	18.3.2021
Interview with RLS pupil	P6	18.3.2021
Interview with RLS pupil	P7	18.3.2021

Interview with RLS pupil	P8	18.3.2021
Interview with RLS pupil	P9	18.3.2021
Interview with RLS pupil	P10	18.3.2021
Interview with RLS pupil	P11	18.3.2021
Interview with RLS pupil	P12	18.3.2021
Interview with RLS pupil	P13	18.3.2021
Interview with RLS pupil	P14	18.3.2021
Interview with RLS pupil	P15	18.3.2021
Interview with RLS pupil	P16	18.3.2021
Interview with RLS pupil	P17	18.3.2021
Interview with RLS pupil	P18	18.3.2021
Interview with RLS pupil	P19	18.3.2021
Interview with RLS pupil	P20	18.3.2021
Interview with RLS pupil	P21	18.3.2021
Interview with RLS pupil	P22	18.3.2021
Interview with RLS pupil	P23	18.3.2021
Interview with RLS pupil	P24	18.3.2021
Interview with RLS pupil	P25	18.3.2021
Interview with RLS pupil	P26	21.3.2021
Interview with RLS pupil	P27	21.3.2021
Interview with RLS pupil	P28	21.3.2021
Interview with RLS pupil	P29	21.3.2021
Interview with RLS pupil	P30	21.3.2021
Interview with RLS pupil	P31	21.3.2021
Interview with RLS pupil	P32	21.3.2021
Interview with RLS pupil	P33	21.3.2021
Interview with RLS pupil	P34	21.3.2021
Interview with RLS pupil	P35	21.3.2021
Interview with RLS pupil	P36	21.3.2021
Interview with RLS pupil	P37	21.3.2021
Interview with RLS pupil	P38	21.3.2021
Interview with RLS pupil	P39	21.3.2021
Interview with RLS pupil	P40	21.3.2021
Interview with RLS pupil	P41	21.3.2021
Interview with RLS pupil	P42	21.3.2021
Interview with RLS pupil	P43	21.3.2021
Interview with RLS pupil	P44	21.3.2021
Interview with RLS pupil	P45	21.3.2021
Interview with RLS pupil	P46	21.3.2021
Interview with RLS pupil	P47	21.3.2021
Interview with RLS pupil	P48	21.3.2021
Interview with RLS pupil	P49	21.3.2021
Interview with RLS pupil	P50	22.3.2021
Interview with RLS pupil	P51	22.3.2021
Interview with RLS pupil	P52	22.3.2021
Interview with RLS pupil	P53	22.3.2021
Interview with RLS pupil	P54	22.3.2021
Interview with RLS pupil	P55	22.3.2021

Interview with RLS pupil	P56	22.3.2021
Interview with RLS pupil	P57	22.3.2021
Interview with RLS pupil	P58	22.3.2021
Interview with RLS pupil	P59	22.3.2021
Interview with RLS pupil	P60	22.3.2021
Interview with RLS pupil	P61	22.3.2021
Interview with RLS pupil	P62	22.3.2021
Interview with RLS pupil	P63	22.3.2021
Interview with RLS pupil	P64	22.3.2021
Interview with RLS pupil	P65	22.3.2021
Interview with RLS pupil	P66	22.3.2021
Interview with RLS pupil	P67	22.3.2021
Interview with RLS pupil	P68	22.3.2021
Interview with RLS pupil	P69	22.3.2021
Interview with RLS pupil	P70	22.3.2021
Interview with RLS pupil	P71	22.3.2021
Interview with RLS pupil	P72	22.3.2021
Interview with RLS pupil	P73	22.3.2021
Interview with RLS pupil	P74	22.3.2021
Interview with RLS pupil	P75	22.3.2021
Interview with RLS pupil	P76	22.3.2021
Interview with RLS pupil	P77	22.3.2021
Interview with RLS pupil	P78	22.3.2021
Interview with RLS pupil	P79	22.3.2021
Interview with RLS pupil	P80	22.3.2021
Interview with RLS pupil	P81	22.3.2021
Interview with RLS pupil	P82	22.3.2021
Interview with RLS pupil	P83	22.3.2021
Interview with RLS pupil	P84	22.3.2021
Interview with RLS pupil	P85	22.3.2021
Interview with RLS pupil	P86	22.3.2021
Interview with RLS pupil	P87	22.3.2021
Interview with RLS pupil	P88	22.3.2021
Interview with RLS pupil	P89	22.3.2021
Interview with RLS pupil	P90	23.3.2021
Interview with RLS pupil	P91	23.3.2021
Interview with RLS pupil	P92	23.3.2021
Interview with RLS pupil	P93	23.3.2021
Interview with RLS pupil	P94	23.3.2021
Interview with RLS pupil	P95	23.3.2021
Interview with RLS pupil	P96	23.3.2021
Interview with RLS pupil	P97	23.3.2021
Interview with RLS pupil	P98	23.3.2021
Interview with RLS pupil	P99	23.3.2021
Interview with RLS pupil	P100	23.3.2021
Interview with RLS pupil	P101	23.3.2021
Interview with RLS pupil	P102	23.3.2021
Interview with RLS pupil	P103	23.3.2021

Interview with RLS pupil	P104	23.3.2021
Interview with RLS pupil	P105	23.3.2021
Interview with RLS pupil	P106	23.3.2021
Interview with RLS pupil	P107	23.3.2021
Interview with RLS pupil	P108	23.3.2021
Interview with RLS pupil	P109	23.3.2021
Interview with RLS pupil	P110	23.3.2021
Interview with RLS pupil	P111	23.3.2021
Interview with RLS pupil	P112	23.3.2021
Interview with RLS pupil	P113	23.3.2021
Interview with RLS pupil	P114	23.3.2021
Interview with RLS pupil	P115	23.3.2021
Interview with RLS pupil	P116	23.3.2021
Interview with RLS pupil	P117	23.3.2021
Interview with RLS pupil	P118	23.3.2021
Interview with RLS pupil	P119	23.3.2021
Interview with RLS pupil	P120	23.3.2021
Interview with RLS pupil	P121	23.3.2021
Interview with RLS pupil	P122	25.3.2021
Interview with RLS pupil	P123	25.3.2021
Interview with RLS pupil	P124	25.3.2021
Interview with RLS pupil	P125	25.3.2021
Interview with RLS pupil	P126	25.3.2021
Interview with RLS pupil	P127	25.3.2021
Interview with RLS pupil	P128	25.3.2021
Interview with RLS pupil	P129	25.3.2021
Interview with RLS pupil	P130	25.3.2021
Interview with RLS pupil	P131	25.3.2021
Interview with RLS pupil	P132	25.3.2021
Interview with RLS pupil	P133	25.3.2021
Interview with RLS pupil	P134	25.3.2021
Interview with RLS pupil	P135	25.3.2021
Interview with RLS pupil	P136	25.3.2021
Interview with RLS pupil	P137	25.3.2021
Interview with RLS pupil	P138	25.3.2021
Interview with RLS pupil	P139	25.3.2021
Interview with RLS pupil	P140	25.3.2021
Interview with RLS pupil	P141	25.3.2021
Interview with RLS pupil	P142	25.3.2021
Interview with RLS pupil	P143	25.3.2021
Interview with RLS pupil	P144	4.4.2021
Interview with RLS pupil	P145	4.4.2021
Interview with RLS pupil	P146	4.4.2021
Interview with RLS pupil	P147	4.4.2021
Interview with RLS pupil	P148	4.4.2021
Interview with RLS pupil	P149	4.4.2021
Interview with RLS pupil	P150	4.4.2021
Interview with RLS pupil	P151	4.4.2021

Interview with RLS pupil	P152	4.4.2021
Interview with RLS pupil	P153	4.4.2021
Interview with RLS pupil	P154	4.4.2021
Interview with RLS pupil	P155	4.4.2021
Interview with RLS pupil	P156	4.4.2021
Interview with RLS pupil	P157	4.4.2021
Interview with RLS pupil	P158	4.4.2021
Interview with RLS pupil	P159	4.4.2021
Interview with RLS pupil	P160	4.4.2021
Interview with RLS pupil	P161	4.4.2021
Interview with RLS pupil	P162	4.4.2021
Interview with RLS pupil	P163	4.4.2021
Interview with RLS pupil	P164	4.4.2021
Interview with RLS pupil	P165	5.4.2021
Interview with RLS pupil	P166	23.4.2021
Interview with RLS pupil	P167	23.4.2021
Interview with RLS pupil	P168	23.4.2021
Interview with RLS pupil	P169	23.4.2021
Interview with RLS pupil	P170	23.4.2021
Interview with RLS pupil	P171	23.4.2021
Interview with RLS pupil	P172	23.4.2021
Interview with RLS pupil	P173	23.4.2021
Interview with RLS pupil	P174	23.4.2021
Interview with RLS pupil	P175	23.4.2021
Interview with RLS pupil	P176	23.4.2021
Interview with RLS pupil	P177	23.4.2021
Interview with RLS pupil	P178	23.4.2021
Interview with RLS pupil	P179	23.4.2021
Interview with RLS pupil	P180	23.4.2021
Interview with RLS pupil	P181	23.4.2021
Interview with RLS pupil	P182	23.4.2021
Interview with RLS pupil	P183	23.4.2021
Interview with RLS pupil	P184	23.4.2021
Interview with RLS pupil	P185	23.4.2021
Interview with RLS pupil	P186	23.4.2021
Interview with RLS pupil	P187	23.4.2021
Interview with RLS pupil	P188	23.4.2021
Interview with RLS pupil	P189	23.4.2021
Interview with RLS pupil	P190	23.4.2021
Interview with RLS pupil	P191	23.4.2021
Interview with RLS pupil	P192	24.4.2021
Interview with RLS pupil	P193	24.4.2021
Interview with RLS pupil	P194	24.4.2021
Interview with RLS pupil	P195	24.4.2021
Interview with RLS pupil	P196	24.4.2021
Interview with RLS pupil	P197	24.4.2021
Interview with RLS pupil	P198	24.4.2021
Interview control group	C1	15.4.2021

Interview control group	C2	15.4.2021
Interview control group	C3	15.4.2021
Interview control group	C4	15.4.2021
Interview control group	C5	15.4.2021
Interview control group	C6	15.4.2021
Interview control group	C7	15.4.2021
Interview control group	C8	15.4.2021
Interview control group	C9	15.4.2021
Interview control group	C10	15.4.2021
Interview control group	C11	15.4.2021
Interview control group	C12	15.4.2021
Interview control group	C13	16.4.2021
Interview control group	C14	16.4.2021
Interview control group	C15	16.4.2021
Interview control group	C16	16.4.2021
Interview control group	C17	16.4.2021
Interview control group	C18	16.4.2021
Interview control group	C19	16.4.2021
Interview control group	C20	7.4.2021
Interview control group	C21	7.4.2021
Interview control group	C22	7.4.2021
Interview control group	C23	7.4.2021
Interview control group	C24	7.4.2021
Interview control group	C25	7.4.2021
Interview control group	C26	7.4.2021
Interview control group	C27	7.4.2021
Interview control group	C28	13.4.2021
Interview control group	C29	13.4.2021
Interview control group	C30	13.4.2021
Interview control group	C31	13.4.2021
Interview control group	C32	13.4.2021
Interview control group	C33	13.4.2021
Interview control group	C34	13.4.2021
Interview control group	C35	13.4.2021
Interview control group	C36	13.4.2021
Interview control group	C37	13.4.2021
Interview control group	C38	13.4.2021
Interview control group	C39	13.4.2021
Interview control group	C40	13.4.2021
Interview control group	C41	13.4.2021
Interview control group	C42	13.4.2021
Interview control group	C43	13.4.2021
Interview control group	C44	14.4.2021
Interview control group	C45	14.4.2021
Interview control group	C46	14.4.2021
Interview control group	C47	14.4.2021
Interview control group	C48	14.4.2021
Interview control group	C49	14.4.2021

Interview control group	C50	14.4.2021
Interview control group	C51	14.4.2021
Interview control group	C52	14.4.2021
Interview control group	C53	14.4.2021
Interview control group	C54	14.4.2021
Interview control group	C55	14.4.2021
Interview control group	C56	14.4.2021
Interview control group	C57	14.4.2021
Interview control group	C58	14.4.2021
Interview control group	C59	14.4.2021
Interview control group	C60	14.4.2021
Interview control group	C61	27.4.2021
Interview control group	C62	27.4.2021
Interview control group	C63	27.4.2021
Interview control group	C64	27.4.2021
Interview control group	C65	27.4.2021
Interview control group	C66	27.4.2021
Interview control group	C67	27.4.2021
Interview control group	C68	27.4.2021
Interview control group	C69	27.4.2021
Interview control group	C70	27.4.2021
Interview control group	C71	27.4.2021
Interview control group	C72	27.4.2021
Interview control group	C73	27.4.2021
Interview control group	C74	27.4.2021
Interview control group	C75	27.4.2021
Interview control group	C76	27.4.2021
Interview control group	C77	27.4.2021
Interview control group	C78	27.4.2021
Interview control group	C79	27.4.2021
Interview control group	C80	27.4.2021
Interview control group	C81	27.4.2021
Interview control group	C82	9.4.2021
Interview control group	C83	9.4.2021
Interview control group	C84	9.4.2021
Interview control group	C85	9.4.2021
Interview control group	C86	9.4.2021
Interview control group	C87	9.4.2021
Interview control group	C88	9.4.2021
Interview control group	C89	9.4.2021
Interview control group	C90	9.4.2021
Interview control group	C91	9.4.2021
Interview control group	C92	9.4.2021
Interview control group	C93	9.4.2021
Interview control group	C94	9.4.2021
Interview control group	C95	9.4.2021
Interview control group	C96	9.4.2021
Interview control group	C97	9.4.2021

Interview control group	C98	9.4.2021
Interview wit RLS teacher	T1	20.3.2021
Interview wit RLS teacher	T2	22.3.2021
Interview wit RLS teacher	T3	26.3.2021
Interview wit RLS teacher	T4	16.3.2021
Interview wit RLS teacher	T5	11.3.2021
Interview wit RLS teacher	T6	12.3.2021 5.-
Interview with Executive Director	ED	9.4.2021
Interview with PM, Project manager	PM	27.3.2021

13. Annexes

Annex 1: Questionnaire for RLS program teachers

Dear teachers,

I greatly appreciate your time and efforts that you will spend filling out this questionnaire.

As you already know I am a student from the Palacky University in the Czech Republic doing my internship here at Rural Literacy Solutions (RLS). Part of my stay here contains field research.

For my diploma thesis, I would like to evaluate the RLS program at your school. There are two main aims of this questionnaire. First find out how different parts of the RLS program (phonic, reading, writing, computing) work at your school. Second, how do you as a teacher feel about the program. Your honest information, and your thoughtful suggestions will help me to objectively evaluate the RLS program.

Please note that all the information included in this survey is confidential and only used for the purposes of my master thesis. All your personal data will be anonymous.

If you need any further information you can contact me on my Ghanaian number 209720509 or on WhatsApp +420724685759.

Questionnaire for RLS program teachers

Your teaching career

1. How long have you been working as a teacher?
2. The name of the school where you teach now:
3. How long have you been teaching at this school?
4. In which grade are you the class teacher?
5. Did you also teach at other schools before? If yes at how many?

RLS training

6. Can you rate the RLS training that you passed in the table below

	Very satisfied	Satisfied	Neutral	Unsatisfied	Very unsatisfied

Length of the training					
Explanation of the RLS program					
Obtaining sufficient study material					
RLS support after training					
Overall feeling of the training					

7. Is there anything about RLS program you would like to have more detailed information during the training?

Would you appreciate any other RLS workshops, trainings or regular meetings with other teachers?

Teaching RLS program

8. How long have you been teaching the RLS program?
9. In last 2 weeks how many classes of RLS program did you teach, in each grades?

P1 …… classes

P2 …… classes

P3 …… classes

P4 …… classes

P5 …… classes

P6 …… classes

10. According to you, in which part of the program are your students in different grades from P1-P6 the weakest / best? Rate your classes on the scale 0-5. (5) Excellent (4) Good (3) Average (2) Below average (1) Poor

	Phonic	Reading	Writing	Computing
P1				
P2				
P3				
P4				
P5				
P6				

11. Would you skip/add any part of the program in some grades at your school?

12. Can you rate the RLS program, at your school.

	Strongly agree.	Agree	Neither agree nor disagree	Disagree	Strongly disagree
RLS program helps your students learn English faster.					
The RLS curriculum complements mainstream schooling					
RLS curriculum is set correctly for all grades.					
RLS program is harder to teach in P1-P3					
RLS program is easy for P6					
Time allocation for the RLS program is sufficient					

About you

Sex: Female   Male

Age:

Your hometown:

What is your highest education and specialization?

Where did you study (city name)?

If there is something in your mind you would like to mention, feel free.

Thank you very much for your time!

teachers						LRS training					students (teacher's rating)			
						scale 0-5. (5) Excellent (4) Good (3) Average (2) Below average (1) Poor								
school location	sex	age	highest education	teaching experience-general	teaching LRS (years)	Length of the training	LRS program explanation	study material	after training support	overall feeling	phonic	reading	writting	classes of LRS program last week (each class)
Tolon-Kumbungu	M	34	high school	12	1	2		2	2	4	3	1	3	2
Kumbungu (P3, P4)	M	31	bachelor	6	3	5		3	4	5	4	5	5	6
Kumbungu (P5, P6)	M	29	bachelor	4	2	5		2	4	4	5	4	5	6
Bong-nawili	M	33	high school	10	1	3		1	1	3	3	3	4	3
Kumbungu 2	M	28	bachelor	3	2	3		2	4	5	4	3	5	5
Tamale(weekend program)	F	23	high school	1	1	5		3	5	4	4	3	4	2

Annex 2 Attendance sheets

Kumbungu

No.	NAMES (alphabetically, surname first)	DATE OF BIRTH M	Y
1	Abuba Jutiadu		
2	Abdula Ibrahim		
3	Abdula Yakubu		
4	Banyan Abdul		
5	Aida Abdul		
6	Aida Huseini		
7	Karim Katawia		
8	Iddi Rashid		
9	Issahaku Faridah		
10	Khairany Thara		
11	Kadir Rashad		
12	Kadir Awal		
13	Sulimana Sumani		
14			
...			
26	Abdalla Anita		
27	Abubakari Zahara		
28	Alhassan Zahara		
29	Aidu Samira		
30	Issahaku Hamdia		
31	Mohammed Adiba		

7TH WEEK — MONTH: MARCH

8TH WEEK — MONTH: MARCH

9TH WEEK — MONTH:

10TH WEEK — MONTH:

11TH WEEK — MONTH:

DAILY TOTALS — NUMBER PRESENT

MORNING BOYS — 11 11 12 12 7 53
MORNING GIRLS — 4 3 5 3 0 15
AFTERNOON BOYS
AFTERNOON GIRLS

WEEKLY TOTALS

TIMES OPEN — A.M. 5 — P.M. — TOTAL 35

TOTAL ATTENDANCES — BOYS 53 — GIRLS 15 — TOTAL 68

Bong-nawili

First Term Commencing 18-01- 20 21

No.	NAMES (alphabetically, surname first)
	BOYS
1	WAHAB-RAHAN MARIM
2	ABDUL-RAHAN ALIAH
3	ABDUL-RAHAN FUSEINI
4	ALHASSAN ISHABAL
5	MOHAMMED ABDUL-RAHAN
6	MOHAMMED SAYIBU
7	HUSAN ABDUL LAWRENCE
8	DANIEL
9	IBRAHIM ABDUL JAMAL
10	IBRAHIM SADDAM
11	ADAM ZUBEMAN
12	ALHASSAN ALHASSAN
	GIRLS
33	ALHASSAN YUSIRA
34	BERIMA RAHAMA

Kumbungu2

First Term Commencing 18 January 20-21

No.	NAMES (alphabetically, surname first)	DATE OF BIRTH M Y	1ST WEEK MONTH: Jan	2ND WEEK MONTH: Jan	3RD WEEK MONTH: Feb
1	ABDUL RASEED SALAMUDEEN				5
2	ABDUL MASSOD HAMDAN				5
3	ABDUL-AZIZ ABDUL WAHAB				5
4	ABDUL RAHMAN ABDUL RAHIM				5
5	ALHASSAN YAKISU				5
6	AMIN ABUBAKAR				5
7	MOHAMMAD ABDUL RAZAK				5
8	MOHAMMAD ABDUL RASHID				5
9	MOHAMMAD YASHARU				5
10	MUMIN ABDUL JALIL				5
11	SALIFU ABDUL MUGMIN				5
12	SALIFU ABDUL HAKIM				5
13	GULLE ALHASSAN				5
14	SULLE YAKUBU				5
15	YAKUBU HUSAINI				5
16	YAKUBU ABDUL AZIZ				5
17	YAKUBU KADIA				5
18	YUSSIF ABUBAKARI				5
19	ABDULAI ZAKARIA				
36	ADAM LATIFA			5	5
37	HANDI FARIHA			5	5
38	IBRAHIM NASIRE			5	5
39	IMRANA MAKSUBA			5	5
40	IDOW RASHIDA			5	5
41	ZAKARIA HAWA			5	5
42	YAKUBU AZARA			5	5
43	ZAKARIA MARIAM			5	5

DAILY TOTALS NUMBER PRESENT	MORNING	BOYS	18 18 18 18 90	18 18 17 17 14	18 18 18 18 18
		GIRLS	8 8 8 8 40	8 8 8 6 30	6 7 6 7 5 31
	AFTERNOON	BOYS			
		GIRLS			

| WEEKLY TOTALS | TIMES OPEN | A.M. 5 | P.M. - | TOTAL 5 | A.M. 5 | P.M. - | TOTAL 5 | A.M. 5 | P.M. - | TOTAL 5 |
| | TOTAL ATTENDANCES | BOYS 90 | GIRLS 40 | TOTAL 130 | BOYS 94 | GIRLS 38 | TOTAL 132 | BOYS 93 | GIRLS 31 | TOTAL 124 |

INSPECTION

1st TERM — Date | Time | Signature | Title

2nd TERM — Date | Time | Signature

3rd — Date | Time

No.		NAMES (alphabetically, surname first)		7TH WEEK MONTH: MARCH		8TH WEEK MONTH: MARCH		9TH WEEK MONTH: MARCH		10TH WEEK MONTH:
				DATE	Total	DATE	Total	DATE	Total	DATE
1	ABDUL RASED	SALAMUDEEN			5		4			
2	ABDUL MALE	HAMDA N			4	0	3			
3	ABDUL MALIK	ABDUL WAHAB			5		4			
4	ABDUL IMASS	ABDUL RAHIM			5		4			
5	ANTHONY	ABUBAKARI			5		4			
6	MOHAMMED	ABDUL RASHID MUNTARI			5	X				
7	MOHAMMED	SUSEINU			5					
8	MOHAMMED	AMIN			4	0	0			
9	MOHAMMED	ABDUL MUGDEEN			5	0	4			
10	SALIM	ABDUL HAKIM			5		4			
11	SALIM	ELHASSAN			5		4			
12	SULEY	YAKUBU			4		3			
13	RWAS	MUSAH AZIZ			5					
14	YAKUBU	ABDUL			5					
15	YAKUBU	NADIA				0	3			
16	YUSSIF	ABUBAKARI								
17	ABDULAI	ZAKARIA								
36	ADAM	LATIFA			5		4	0		
37	HARDI	FAKIHA			4		4			
38	IBRAHIM	NASIKE			5		3			
39	IMANA	MANSURA			5		4			
40	TIDOW	RASHIDA			5		4	0		
41	ZAKARIA	HAWA	00000	0	0 0000	0		0		
42	YAKUBU	AZARA		5		4				
43	ZAKARIA	MARIAM								

DAILY TOTALS	NUMBER PRESENT {	MORNING {	BOYS	17 8 19 9 18	91	18 19 7 18	72		
			GIRLS	7 7 7 7 6	34	7 7 6	27		
		AFTERNOON {	BOYS						
			GIRLS						

WEEKLY TOTALS	TIMES OPEN		A.M. 5	P.M. —	TOTAL	A.M. 4	P.M. —	TOTAL 4	A.M.	P.M.	TOTAL	A.M.	P.M.
	TOTAL ATTENDANCES		BOYS 91	GIRLS 34	TOTAL 125	BOYS 72	GIRLS 27	TOTAL 99	BOYS	GIRLS	TOTAL	BOYS	GIRLS

First Term Commencing ___18/01___ 20 _21_

No.	ADMISSION NUMBER	NAMES (alphabetically, surname first)	DATE OF BIRTH M Y	1ST WEEK MONTH: JAN		2ND WEEK MONTH:		3RD WEEK MONTH: FEB		4TH WEEK MONTH: FEB		5TH WEEK MONTH: FEB		6TH WEEK MONTH: FEB	
1		Abdulia Latipatu													
2		Abdulia Abrahim													
3		Abdulia Vakeau													
4		Banger Magula													
5															
6		Azizu Ausari													
7		Hassia Laurance													
8		Issa Saga													
9															
10		Issahaku Fatuiah													
11		Ragony Saadi													
12		Salifu Awal													
13		Sulimana Suwani													

			MORNING	BOYS	5 9 8 8 8	37	10 11 8 8 7	44	12 12 12 12 9	57	12 12 10 10 9	53	9 11 11 9	50	8 9 13 9 8 6	
	NUMBER PRESENT			GIRLS	0 1 2 1 1	5	1 3 1 1 2	8	3 3 3 3 1	13	4 4 4 4 4	20	4 5 4 5 2	20	4 5 5 4 1	
			AFTERNOON	BOYS												
				GIRLS												

| WEEKLY TOTALS | TIMES OPEN | A.M. 5 | P.M. | TOTAL 5 | A.M. 5 | P.M. | TOTAL 10 | A.M. 5 | P.M. | TOTAL 15 | A.M. 5 | P.M. | TOTAL 20 | A.M. 5 | P.M. | TOTAL 25 | A.M. 5 | P.M. | TOTAL 3 |
| | TOTAL ATTENDANCES | BOYS 37 | GIRLS 5 | TOTAL 42 | BOYS 44 | GIRLS 8 | TOTAL 52 | BOYS 57 | GIRLS 13 | TOTAL 70 | BOYS 53 | GIRLS 20 | TOTAL 73 | BOYS 50 | GIRLS 20 | TOTAL 70 | BOYS 90 | GIRLS 19 | TOTAL 6 |

No.	NAMES
26	Abdulia Basta
27	Abubakari Zahara
28	Alhassan Zahara
29	Alidu Samira
30	Issahaku Hamida
31	Mohammed Aicha

Annex 3 Test for RLS students and control group

Test will include

· Letter sounds

· Whole word reading

· Word Writing

School name:

Sex: Male Female

Age:

Grade:

Do you speak English at home?

Letter sounds: D H K L P

Reading test:

P3: BAG, CAR, HAM, DOG, CAT

P4: BOY, GIRL, TABLE, HEAD, FIRE

P5:YELLOW, FOOTBALL, BROTHER, SKIN, HOUSE

P6: FLOWER, PHONE, COUNTRY, BLANKET, FOREST

Writing test:

P3: BAG, CAR, HAM, DOG, CAT

P4: BOY, GIRL, TABLE, HEAD, FIRE

P5:YELLOW, FOOTBALL, BROTHER, SKIN, HOUSE

P6: FLOWER, PHONE, COUNTRY, BLANKET, FOREST

Annex 4 –Pupils data (answers)

experimental group							
school location	sex	age	grade	speaking english at home	letter sound	reading	Writing
Tolon-Kumbungu	M	11	P4	NO	5	3	5
Tolon-Kumbungu	M	9	P4	NO	1	1	5
Tolon-Kumbungu	M	10	P4	NO	5	4	5
Tolon-Kumbungu	M	10	P4	NO	5	1	5
Tolon-Kumbungu	M	11	P4	NO	4	4	4
Tolon-Kumbungu	M	10	P4	NO	5	4	5
Tolon-Kumbungu	M	11	P4	NO	5	4	5
Tolon-Kumbungu	M	10	P4	NO	3	3	5
Tolon-Kumbungu	F	10	P4	NO	4	4	5
Tolon-Kumbungu	M	10	P4	NO	5	3	5
Tolon-Kumbungu	M	10	P4	NO	5	4	5
average P4					**4.27**	**3.18**	**4.91**
Tolon-Kumbungu	F	14	P5	YES	5	5	5
Tolon-Kumbungu	F	10	P5	NO	5	5	5
Tolon-Kumbungu	F	10	P5	NO	5	5	5
Tolon-Kumbungu	F	14	P5	YES	5	5	5
Tolon-Kumbungu	F	10	P5	NO	0	0	3
Tolon-Kumbungu	M	10	P5	NO	5	5	5
Tolon-Kumbungu	M	11	P5	NO	5	2	5
Tolon-Kumbungu	M	12	P5	NO	5	0	5
Tolon-Kumbungu	M	10	P5	NO	5	5	5
Tolon-Kumbungu	F	14	P5	YES	5	5	5
Tolon-Kumbungu	F	14	P5	NO	5	4	5
Tolon-Kumbungu	F	14	P5	YES	5	5	5
Tolon-Kumbungu	M	13	P5	NO	5	5	5
Tolon-Kumbungu	F	13	P5	YES	5	4	5
Tolon-Kumbungu	F	13	P5	NO	5	5	5
Tolon-Kumbungu	F	10	P5	NO	5	5	5
Tolon-Kumbungu	F	12	P5	YES	4	0	5
Tolon-Kumbungu	M	13	P5	NO	5	5	5
Tolon-Kumbungu	M	13	P5	YES	5	3	5
Tolon-Kumbungu	M	14	P5	NO	5	5	5
Tolon-Kumbungu	M	13	P5	NO	5	5	5
Tolon-Kumbungu	F	13	P5	NO	5	4	5

Tolon-Kumbungu	F	10	P5	NO	5	3	5
Tolon-Kumbungu	M	13	P5	NO	5	5	5
average P5					**4.75**	**3.96**	**4.92**
Tolon-Kumbungu	M	15	P6	NO	5	5	5
Tolon-Kumbungu	M	15	P6	NO	5	5	5
Tolon-Kumbungu	M	15	P6	NO	5	5	5
Tolon-Kumbungu	F	15	P6	NO	5	0	5
Tolon-Kumbungu	M	15	P6	NO	5	5	5
Tolon-Kumbungu	F	15	P6	NO	5	0	5
average P6					**5.00**	**3.33**	**5.00**
village							
Kumbungu	M	10	P3	NO	4	0	5
Kumbungu	M	9	P3	NO	4	0	5
Kumbungu	F	15	P3	NO	5	2	5
Kumbungu	F	10	P3	NO	3	1	5
Kumbungu	F	8	P3	NO	4	0	5
Kumbungu	F	10	P3	NO	2	0	5
Kumbungu	M	9	P3	NO	3	0	3
Kumbungu	F	10	P3	NO	3	0	3
Kumbungu	M	10	P3	NO	1	0	0
Kumbungu	F	10	P3	NO	2	2	3
Kumbungu	M	12	P3	NO	0	0	3
Kumbungu	F	10	P3	NO	5	2	5
Kumbungu	M	9	P3	NO	5	3	4
Kumbungu	M	10	P3	NO	4	0	5
Kumbungu	M	10	P3	NO	2	1	5
Kumbungu	M	9	P3	NO	1	0	1
Kumbungu	F	10	P3	NO	3	0	5
average P3					**3.00**	**0.65**	**3.94**
Kumbungu	M	11	P4	YES	5	0	5
Kumbungu	M	10	P4	NO	5	5	5
Kumbungu	M	12	P4	NO	4	4	5
Kumbungu	M	13	P4	NO	4	4	5
Kumbungu	M	10	P4	NO	4	1	5
Kumbungu	M	12	P4	NO	4	1	4
Kumbungu	M	12	P4	NO	1	0	3
Kumbungu	M	13	P4	NO	5	4	5
Kumbungu	M	12	P4	NO	5	5	5
Kumbungu	F	13	P4	NO	5	5	5
Kumbungu	M	11	P4	YES	5	1	5
Kumbungu	M	11	P4	YES	4	5	5
Kumbungu	M	15	P4	NO	5	0	5
Kumbungu	F	14	P4	NO	5	2	5
Kumbungu	M	13	P4	NO	5	5	5
Kumbungu	M	9	P4	NO	4	3	5
Kumbungu	F	11	P4	NO	3	0	2
Kumbungu	M	11	P4	NO	2	0	4

Kumbungu	F	10	P4	NO	3	3	5
Kumbungu	F	11	P4	NO	0	0	0
Kumbungu	F	10	P4	NO	3	1	3
Kumbungu	M	10	P4	NO	5	5	4
Kumbungu	F	10	P4	NO	4	5	5
Kumbungu	M	11	P4	NO	5	3	5
Kumbungu	F	12	P4	NO	5	5	5
Kumbungu	M	12	P4	NO	2	4	5
Kumbungu	F	12	P4	NO	5	0	5
Kumbungu	F	12	P4	NO	3	5	5
Kumbungu	F	11	P4	NO	5	1	5
Kumbungu	M	8	P4	NO	5	4	5
Kumbungu	F	13	P4	NO	4	5	4
Kumbungu	M	13	P4	NO	4	4	3
Kumbungu	M	12	P4	NO	2	0	5
Kumbungu	F	13	P4	NO	3	1	5
Kumbungu	M	11	P4	NO	3	0	5
average P4					**3.89**	**2.60**	**4.49**
Kumbungu	M	12	P5	YES	5	5	5
Kumbungu	M	14	P5	NO	5	4	5
Kumbungu	M	12	P5	YES	5	5	5
Kumbungu	F	13	P5	YES	5	5	4
Kumbungu	M	13	P5	YES	5	3	5
Kumbungu	M	15	P5	YES	5	5	5
Kumbungu	F	11	P5	NO	5	5	5
Kumbungu	F	16	P5	NO	3	0	5
Kumbungu	M	15	P5	YES	5	3	4
Kumbungu	M	15	P5	YES	1	0	5
average P5					**4.4**	**3.5**	**4.8**
Kumbungu	F	15	P6	NO	5	0	5
Kumbungu	M	12	P6	YES	5	3	5
Kumbungu	M	15	P6	NO	5	4	5
Kumbungu	M	10	P6	NO	3	2	5
Kumbungu	M	15	P6	YES	5	3	5
Kumbungu	F	15	P6	NO	5	5	5
Kumbungu	F	14	P6	NO	5	5	5
Kumbungu	M	14	P6	YES	5	3	5
Kumbungu	F	14	P6	NO	5	3	3
Kumbungu	F	15	P6	NO	5	4	5
Kumbungu	F	14	P6	NO	5	5	5
Kumbungu	F	13	P6	YES	5	2	5
Kumbungu	F	16	P6	NO	5	5	5
Kumbungu	M	15	P6	NO	3	2	5
Kumbungu	F	16	P6	NO	2	0	3
Kumbungu	F	12	P6	NO	5	3	5
Kumbungu	F	13	P6	YES	5	0	5

Kumbungu	M	13	P6	NO	5	3	5
Kumbungu	F	14	P6	NO	5	0	5
Kumbungu	M	15	P6	NO	5	3	5
Kumbungu	F	16	P6	NO	5	5	5
Kumbungu	F	24	P6	YES	3	0	5
Kumbungu	M	14	P6	NO	5	5	5
Kumbungu	F	14	P6	YES	5	4	5
Kumbungu	M	12	P6	YES	5	4	5
average 6					**4.64**	**2.92**	**4.84**
most rural area, nearest village 28 km							
Bong-nawili	M	10	P4	NO	2	1	3
Bong-nawili	M	10	P4	NO	5	0	5
Bong-nawili	F	10	P4	NO	5	0	4
Bong-nawili	F	11	P4	NO	5	1	5
Bong-nawili	F	10	P4	NO	5	0	5
Bong-nawili	M	10	P4	NO	5	2	5
Bong-nawili	M	11	P4	NO	2	0	5
Bong-nawili	M	10	P4	NO	3	0	5
Bong-nawili	F	10	P4	NO	0	0	0
průměr P4					**3.56**	**0.44**	**4.11**
Bong-nawili	F	13	P6	NO	5	1	5
Bong-nawili	M	14	P6	YES	5	5	5
Bong-nawili	M	13	P6	YES	5	5	5
Bong-nawili	M	13	P6	NO	5	5	5
Bong-nawili	M	14	P6	NO	4	5	5
Bong-nawili	M	17	P6	NO	5	5	5
Bong-nawili	M	15	P6	NO	5	3	5
Bong-nawili	M	14	P6	NO	5	5	5
average P6					**4.88**	**4.25**	**5.00**
village							
Kumbungu 2	F	10	P4	NO	2	0	3
Kumbungu 2	F	10	P4	NO	3	0	2
Kumbungu 2	F	10	P4	NO	2	0	1
Kumbungu 2	M	10	P4	NO	5	5	5
Kumbungu 2	M	10	P4	NO	3	0	5
Kumbungu 2	M	8	P4	NO	5	5	5
Kumbungu 2	F	8	P4	NO	2	0	5
Kumbungu 2	M	10	P4	NO	5	2	3
Kumbungu 2	M	10	P4	YES	5	5	5
Kumbungu 2	M	10	P4	YES	5	5	5
Kumbungu 2	M	10	P4	YES	5	5	5
Kumbungu 2	M	11	P4	YES	5	5	5
průměr P4					**3.92**	**2.67**	**4.08**
Kumbungu 2	F	12	P5	NO	5	4	5
Kumbungu 2	F	14	P5	YES	5	4	5
Kumbungu 2	F	12	P5	NO	4	4	5

Kumbungu 2	M	11	P5	YES	5	4	5
Kumbungu 2	F	12	P5	NO	5	4	5
Kumbungu 2	M	6	P5	NO	5	3	5
Kumbungu 2	M	12	P5	YES	5	5	5
Kumbungu 2	M	12	P5	NO	5	3	5
průměr P5					**4.9**	**3.9**	**5.0**
city *there is no control group for the weekend program							
Tamale(weekend program)	F	12	P5	YES	5	2	5
Tamale(weekend program)	M	12	P5	NO	5	2	5
Tamale(weekend program)	M	12	P5	NO	5	3	5
Tamale(weekend program)	M	12	P5	YES	5	5	5
Tamale(weekend program)	M	12	P5	NO	4	4	5
Tamale(weekend program)	M	12	P5	YES	5	3	4
Tamale(weekend program)	M	12	P5	NO	3	2	5
Tamale(weekend program)	F	11	P5	YES	4	4	5
Tamale(weekend program)	F	13	P4	NO	3	4	1
Tamale(weekend program)	F	12	P5	NO	5	2	5
Tamale(weekend program)	F	12	P4	NO	5	2	2
Tamale(weekend program)	F	10	P5	YES	5	3	3
Tamale(weekend program)	F	10	P5	NO	5	5	5
Tamale(weekend program)	F	10	P5	YES	5	4	5
Tamale(weekend program)	F	11	P5	NO	5	5	4
Tamale(weekend program)	F	10	P5	NO	5	4	5
Tamale(weekend program)	F	13	P5	NO	1	0	0
Tamale(weekend program)	F	10	P5	NO	1	1	4
Tamale(weekend program)	F	13	P5	YES	5	5	5
Tamale(weekend program)	F	10	P5	YES	3	3	5
Tamale(weekend program)	F	13	P5	NO	5	5	5
Tamale(weekend program)	F	10	P5	YES	5	5	5
Tamale(weekend program)	F	12	P4	YES	5	5	5
Tamale(weekend program)	F	12	P4	YES	5	3	4
Tamale(weekend program)	F	12	P4	NO	5	2	4
Tamale(weekend program)	M	12	P6	NO	5	4	4
Tamale(weekend program)	M	12	P5	YES	5	3	3
Tamale(weekend program)	M	13	P5	NO	5	2	5
Tamale(weekend program)	M	11	P5	NO	5	3	4
Tamale(weekend program)	M	11	P4	NO	2	1	4
Tamale(weekend program)	M	10	P1	NO	5	2	4
Tamale(weekend program)	M	16	P4	NO	5	1	4
Tamale(weekend program)	M	12	P4	NO	5	3	5
average weekend program					**4.42**	**3.09**	**4.21**

control group

school location	sex	age	grade	speaking english at home	letter sound	reading	writing
Tolon-Kumbungu	M	11	P4	NO	3	2	4
Tolon-Kumbungu	F	10	P4	NO	3	1	5
Tolon-Kumbungu	M	10	P4	YES	4	3	4
Tolon-Kumbungu	M	10	P4	YES	5	3	4
Tolon-Kumbungu	M	9	P4	NO	3	3	4
Tolon-Kumbungu	M	11	P4	NO	4	2	4
average control P4					**3.67**	**2.33**	**4.17**
Tolon-Kumbungu	F	10	P5	NO	1	1	2
Tolon-Kumbungu	M	14	P5	YES	4	3	4
Tolon-Kumbungu	M	10	P5	NO	5	2	4
Tolon-Kumbungu	M	10	P5	NO	4	3	3
Tolon-Kumbungu	F	14	P5	NO	2	1	3
Tolon-Kumbungu	M	10	P5	NO	3	2	4
Tolon-Kumbungu	M	10	P5	NO	3	2	3
Tolon-Kumbungu	F	10	P5	NO	4	2	4
Tolon-Kumbungu	F	11	P5	NO	2	1	3
Tolon-Kumbungu	M	12	P5	YES	4	3	5
Tolon-Kumbungu	M	11	P5	NO	3	2	3
Tolon-Kumbungu	M	12	P5	NO	3	1	4
average control P5					**3.17**	**1.92**	**3.50**
Tolon-Kumbungu	M	14	P6	NO	1	0	3
Tolon-Kumbungu	M	13	P6	YES	4	4	5
Tolon-Kumbungu	M	13	P7	YES	4	3	5
average control P6					**3.00**	**2.33**	**4.33**
village							
Kumbungu	M	P3	8	NO	2	0	4
Kumbungu	M	P3	9	NO	2	0	3
Kumbungu	M	P3	8	NO	3	2	4
Kumbungu	M	P3	10	NO	2	0	4
Kumbungu	F	P3	10	NO	3	1	3
Kumbungu	F	P3	11	NO	2	1	3
Kumbungu	M	P3	9	NO	1	0	3
Kumbungu	F	P3	8	YES	4	0	2
average control P3					**2.38**	**0.50**	**3.25**
Kumbungu	F	P4	13	NO	2	0	3
Kumbungu	M	P4	11	NO	4	1	4
Kumbungu	F	P4	12	NO	3	1	2
Kumbungu	M	P4	12	NO	2	0	4
Kumbungu	M	P4	13	NO	2	1	4
Kumbungu	M	P4	10	YES	3	2	4
Kumbungu	F	P4	10	NO	3	1	3
Kumbungu	M	P4	11	NO	4	0	3

Kumbungu	M	P4	12	NO	0	2	4
Kumbungu	F	P4	10	NO	3	2	4
Kumbungu	M	P4	12	NO	2	1	3
average control P4					**2.55**	**1.00**	**3.45**
Kumbungu	F	P5	12	NO	1	0	3
Kumbungu	F	P5	13	NO	2	1	3
Kumbungu	M	P5	13	NO	3	2	4
Kumbungu	F	P5	12	NO	3	1	3
Kumbungu	M	P5	10	YES	4	2	5
average control P5					**2.6**	**1.2**	**3.6**
Kumbungu	M	P6	14	NO	2	1	3
Kumbungu	F	P6	13	NO	4	2	4
Kumbungu	M	P6	14	NO	4	3	5
Kumbungu	M	P6	15	YES	4	3	5
Kumbungu	M	P6	13	NO	5	4	4
Kumbungu	M	P6	14	NO	4	4	5
Kumbungu	M	P6	13	NO	3	2	4
Kumbungu	M	P6	13	NO	3	1	4
Kumbungu	M	P6	13	NO	3	2	5
Kumbungu	M	P6	12	YES	4	3	4
Kumbungu	M	P6	13	NO	4	4	5
Kumbungu	F	P6	14	NO	5	4	5
Kumbungu	M	P6	11	NO	3	2	4
average control P6					**3.69**	**2.69**	**4.38**
most rural area, nearest village 28 km							
Bong-nawili	F	12	P4	NO	0	0	1
Bong-nawili	M	10	P4	NO	1	0	1
Bong-nawili	M	11	P4	NO	1	1	2
Bong-nawili	M	9	P4	NO	0	0	0
Bong-nawili	M	12	P4	NO	1	0	1
Bong-nawili average contol P4					**0.6**	**0.2**	**1**
Bong-nawili	M	12	P6	NO	0	0	0
Bong-nawili	M	10	P6	NO	2	2	3
Bong-nawili	F	13	P6	NO	2	1	3
Bong-nawili	M	14	P6	NO	1	0	1
Bong-nawili average contol P6					**1.25**	**0.75**	**1.75**
village							
Kumbungu 2	F	10	P4	NO	1	0	3
Kumbungu 2	M	11	P4	NO	4	3	4
Kumbungu 2	M	9	P4	YES	1	0	2
Kumbungu 2	M	8	P4	NO	4	3	3
Kumbungu 2	F	10	P4	NO	2	0	2
Kumbungu 2	M	10	P4	YES	4	3	4
Kumbungu 2	M	14	P4	YES	5	5	5
Kumbungu 2 average control P4					**3.00**	**2.00**	**3.29**
Kumbungu 2	M	12	P5	NO	3	0	3

Kumbungu 2	M	11	P5	NO	2	1	2
Kumbungu 2	M	12	P5	NO	3	1	3
Kumbungu 2	F	10	P5	NO	4	3	5
Kumbungu 2	M	12	P5	NO	3	2	4
Kumbungu 2 average control P5					**3**	**1.4**	**3.4**