An assessment of school feeding programme - pilot phase and its relationship with enrolment, attendance, retention and the local agricultural production in Nampula province in Mozambique

By

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DECLARATION

I declare that the thesis, which I hereby submit for the degree Doctor of Philosophiae in Public Health at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at another University.

Signed: _____ Date _____

SUMMARY

Background: In developing countries hunger, poverty and malnutrition are constraint to learning. Unfortunately, the primary school children are the most affected group due to their vulnerability. Implementation of school feeding programmes can improve both the welfare of school children and the livelihood of local smallholder farmers.

Aim: This study assessed the role of the Mozambique National School Feeding Programme on enrolment, retention, and attendance of learners, and its possible role in local agriculture, in Nampula Province, 2013-2015.

Methods: Mixed method research was applied, which is a combination of qualitative and quantitative approaches. Secondary data was obtained on learner enrolments, attendance and dropouts for eight purposively selected schools from school and Provincial Directorate of Education records. The opinions of learners, teachers, and principals were surveyed using semi-structured interviews. Focus group discussions were held with parents' committee members and farmers. Chi square tests and logistic regression models were used to predict the likelihood of enrolment and retention of learners in schools that either introduced or did not introduce school feeding programs; the Mann-Whitney test was used to compare the median number of days missed at school.

Results: After the national school feeding programme was introduced in 2014, enrolments increased in the four schools with feeding schemes (2014: $Chi(6_{df})35.4279$, $p<.001$, 2015: $Chi(6_{df})32.7172$, $p<.001$). In 2013, all eight schools had similar retention rates ($Chi(6_{df})7.7302$, $p<.259$). However, after the introduction of school feeding programme, learner retention rates in the schools with feeding schemes were significantly higher ($Chi(6_{df})$ 222.2180, $p<.001$) and 2015 $Chi(6_{df})32.6221$, $p<.001$). Both univariate and multivariate logistic regression modelling confirmed increased enrolment and retention following the introduction of school feeding. Concerning attendance, the Mann-Whitney test showed that in 2013, before to the introduction of school feeding programme, there was no significant difference between schools with school feeding programme and schools without $p= 0.8879$. However, after the introduction of the school feeding programme, a statistically significant difference was found between the median number of absent days between the two groups of schools ($p= <0. 001$). A balanced menu was developed, but because school feeding was only introduced in 2014, there was no time for

farmers to cultivate the required foods. However, the results obtained from interviews with key informants revealed that most products used in the NSFP can be grown locally. Focus group discussions indicated that all stakeholders were in favour of the scheme.

Conclusion: The role of school feeding programmes on educational outcomes for children is difficult to measure because of external variables such as the quality of education received, teacher subject knowledge or availability of teachers and access to resources. However, the assessment compensated for these variables as much as possible by triangulating the results of all three methodologies.

The results of the study indicate that the introduction of a school feeding programme in Nampula Province, Mozambique, appears to have a positive influence on the increased enrolment, attendance, and retention of primary school learners. Schools without school feeding programs failed to retain learners. Furthermore, it seems that most of the foodstuffs included in the menu could be grown locally in future. It is recommended that the role of local agriculture in the Mozambique National School Feeding Programme should be the subject of further research, especially as seasonality needs to be considered.

Keywords: School feeding programme, primary schools, learner enrolment, learner retention, Nampula Mozambique

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ACRONYMS AND ABREVIATIONS

DSEA	District Services of Economic Activities
FAO	Food and Agriculture Organization of the United Nations
FFE	Food for Education
FGD	Focus Group Discussion
GDP	Gross Domestic Product
HGSFP	Home Grown School Feeding Programme
INE	National Statistics Institute
JAM	Joint Aid Management
LIFDC	Low Income Food Deficit Country
MINEDH	Mozambique's Ministry of Education and Human Development
NEPAD	New Partnership for Africa's Development
NSFP	National School Feeding Programme
OAU	Organization for African Unity
PRONAE	*Programa Nacional de Alimentacão Escolar*
SADC	Southern African Development Community
SDGs	Sustainable Development Goals
SFP	School Feeding Programme
THRs	Take Home Rations
UGEA	Acquisition Management and Execution Unit
UN	United Nations
UNDAF	United Nations Development Assistance Framework
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
USA	United States of America
USAID	United States Agency for International Development
WB	World Bank
WFP	World Food Programme
WHO	World Health Organization

CHAPTER ONE:

1 Introduction

1.1 Contextual background

In many low-income households, hunger has been a barrier to children's school participation. A hunger-stricken child is not only unable to enrol in school at the right age but also cannot attend properly even if enrolled[1]. Such children are also likely to quit school because they have to deal with their immediate subsistence needs before they get ready for schooling[1]. Low enrolment, gender disparity and high learners' dropouts constitute barriers to child education especially in areas of high food insecurity.

Due to these reasons, the level of education has also been low in many developing countries, although both private and social returns to education are recognized to be high[2]. However, there is no doubt that other manifestations of "poverty other than hunger" also affect school participation among poor households[3].

Mozambique is one of the low-income countries in Sub-Saharan Africa where poverty and hunger have been a major barrier to child education. The country has historically experienced severe famines, often in drought affected rural areas. Households in such areas usually find it difficult to feed the entire family, since their own production of food falls short of the demand in the household. Consequently, even children need to engage in activities to generate livelihood for their households. Thus, many primary school age children in food insecure areas remain out of school[4].

In response to these challenges, various interventions have been introduced. Policies have been designed both at national and international level to help households invest in children's education. One of those policies is the School Feeding Programme (SFP)[4], which aims at motivating poor households to invest in education, by subsidising some of the costs of school participation[4].

Studies have shown that school meals have the potential to directly address hunger and nutrition by improving the quality of learner diets; increasing both school participation and conclusion[5,6]. Beyond the immediate benefits for children, school meals, when linked to local

smallholder farming and agricultural development, can also shorten supply chains and ensure the diversification of food procurement, increasing the use of traditional, neglected and underutilized foods, while enhancing biodiversity conservation and environmental sustainability[7,8]. Therefore, school-feeding programmes could bring positive effects for both schoolchildren and the communities around the schools[6].

1.2 Problem statement

Over the years the successive governments of Mozambique have instituted programs and policies to" make primary education affordable and accessible to all citizens and improve educational outcomes. These policies directives include the introduction of free complete Primary Education (1-7 grade), free distribution of school books, implementation of a Policy Investment Framework. Other interventions include the introduction of the Mozambique In-Service Teacher Education Program (MITEP); and increasing budget allocation to primary education[9]. Despite significant advances in access to education (net enrolment ratios increased from 44% in 1990 to 87.7% in 2013)[10]; Mozambique is considered the lowest ranked country in the world concerning mean years of schooling at just 1.2 years, compared to the average of the Least Developed Countries of 3.7 years[11]. Many children, having entered grade one, do not complete the full seven years of Primary Education with 39.6% of children out of school[9].

There is recognition worldwide of the role that SFP play in encouraging school enrolment and attendance[12,13]. This is an objective that made the Government of Mozambique made in 2013, when they introduced its SFP as a pilot programme in four high food insecure provinces in the country.

The proponents of school feeding programmes claim that providing food in schools would attract vulnerable children to school, improve their attendance and minimizes drop-outs[2]. According to the United Nations World Food Programme, School Feeding Programme is an incentive for vulnerable families to invest in children's education and encourages affected households to send children to school and help to keep them there[14].

Empirical studies have revealed that School Feeding Programme (SFP) have a significant positive impact on learners participation in school[15]. This study sought to find out the role of SFP on enrolment and retention in primary schools and see whether local producers of Nampula province could supply the NSFP.

1.3 Research justification

Most children in school, both urban and rural, especially in non-developed countries, have been found to be suffering from hunger not only when they are at school, but also when they are with their poverty-stricken families.[16] This exposes them to not just malnutrition and ill health but also poor performance in their academic work[17].

The Mozambique National School Feeding Programme (NSFP) guidelines suggest that the food supplied to the schools should be procured locally as a strategy in promoting domestic food production and improving market access for resource-poor farmers in rural and food insecure areas.[18] Properly implemented, the SFP is aimed at reducing short-term hunger and improved school enrolment, attendance, and retention.

However, because the NSFP is a new phenomenon in Mozambique, its role and performance of such programme are hardly known. Thus, the suggested positive impact of this NSFP is not experienced in its totally in the country. As mentioned earlier above, no study has been conducted to assess the role of the NSFP in the country; this then necessitated a study of this nature.

1.4 Research question

The question was therefore whether the SFP, especially in the rural schools of Nampula province, had improved learner enrolment, attendance and retention and whether this could be supported by accessing food products from local farmers.

To operationalize the research objectives, the following research questions were formulated:

1. What was the role of the NSFP on learner enrolment attendance and retention in primary schools of Nampula province?
2. How capable were the small famers in supplying food ingredients to the NSFP market?

1.5 Research aim

The study aimed to explore and describe the NSFP in Nampula province of Mozambique and assess its role in improving learner enrolment, attendance, and retention. Secondly, the agricultural production in Nampula was also investigated to see whether the food used in NSFP could be obtained from local farmers.

1.5.1 Specific objectives

1. To describe the demographic characteristics of the study population, school environment and perceptions regarding NSFP implementation at school level in Nampula province.
   To obtain this information:

   - An individual learner questionnaire was developed and administered to grade 6 and 7 learners in each SFP School.

2. To assess the role of NSFP on learner enrolment in primary schools that implemented the programme compared with schools that did not implement it.
3. To assess the role of NSFP on learner attendance in primary schools that implemented the programme and compare with schools that did not implement.
4. To assess the role of NSFP on learner retention in primary schools that implemented the programme and compare with schools that did not implement.

   For this assessment;

   - A specific tool (checklist) was developed to gather individual learner school records (enrolment, attendance, and dropout data) in the NSFP and non-SFP schools.

5. To assess whether the food used in NSFP could be in future be obtained from local producers. This was done as follows:

   - A separate questionnaire was developed and administered to local farmers to assess if the food used in NSFP could be obtained from local farmers in future.
   - Document review and maps were used to illustrate agricultural capacity in Nampula province, Mozambique.

6. To describe the challenges experienced in the delivery of SFP in Nampula Province

1.6 Study hypotheses

The following hypotheses were tested for the education outcomes (enrolment, attendance and retention) to support the finding of the study:

Hypothesis 1

H0: There is no statistically significant relationship between the NSFP and school enrolment.

H1: There is a statistically significant relationship between the NSFP and school enrolment

Hypothesis 2

H0: There is no statistically significant relationship between the NSFP and school retention.

H1: There is a statistical significant relationship between the NSFP and school retention.

Hypothesis 3

H0: There is no statistically significant relationship between the NSFP and school attendance.

H1: There is a statistically significant relationship between the NSFP and school attendance.

Observation analysis of agriculture related to the SFP in Nampula province

As it was not possible to use quantitative methods for evaluating the capacity of agriculture to meet the needs of the school feeding scheme in future, qualitative methods were used to establish whether there would be capacity to supply the ingredients used in meals. This method was based on secondary data from the Department of Agriculture, as well as focus group discussions (FGD) with key informants in the agriculture sector in the study area.

1.7 Limitations and assumptions of the pilot phase evaluation

This study did not use an experimental study design in which the researcher would be involved in randomly assigning the intervention to learners with clear and defined criteria for NSFP schools and non-NSFP schools. Such a design would have allowed collection and systematically control other intervening and confounding variables or factors. This would have allowed more precise linkage of the programme to the perceived benefits. Implementation of a purely experimental design was not possible due to ethical reasons, and the government had already purposively selected the NSFP schools with reasons discussed such as high enrolment and their central location.

To overcome this limitation, the study incorporated multiple study designs. A retrospective cohort study design was used to give an analytical aspect to evaluate the potential role of NSFP on school attendance while an analytic cross-sectional study design was adopted for enrolment and retention assessment. Study records were obtained from the four schools participating in the NSFP within Nampula district, and the researcher selected four comparison schools. Selection criteria outlined in the methodology chapter allowed the records for the comparison schools to be used. Accessing and obtaining learners records and registers allowed the

researcher to assess three years, 2013, 2014 and 2015. Baseline information was obtained from 2013 and post NSFP from 2014 and 2015. A longer period would have been ideal to discern trends over time. However, the research only focused on the immediate evaluation of the NSFP pilot phase roll out. The study objectives were also limited to factors that were able to be measured and recorded retrospectively from school records, with two main confounding variables collected for gender and age, as these factors could have direct influence over enrolment, retention, and attendance. School performance and nutritional status were not included in this evaluation due to the complexities around measuring and attributing changes to NSFP retrospectively. Such designs have been used in previous studies and can reflect to some extent the influence of the programme[12,19]

1.8 Thesis structure and outline

Chapter 1. Summarises the background and motivation for this study and describes the problem statement, justification and rationale for the thesis.

Chapter 2. Is a literature review, which covers the concept of SFPs globally and regionally, the concept of Home Grown SFP, school feeding and educational benefits, school feeding and nutrition. It also presents the role of SFPs in enhancing small-holder agricultural development and lastly it approaches the school feeding procurement modalities.

Chapter 3. Gives an overview of Mozambique, describes the agriculture in the country and the general description of the National School Feeding Programme.

Chapter 4. Describes methodology including the study design, describes the socio demographic profile of Nampula province, including a map showing the study Districts, population, sampling frame, sampling process, data collection, study analysis as well as ethical approval

Chapter 5. Presents and interprets the study results and discussion. It gives demographic characteristics of the study population including description of schools and school infrastructure. It also presents results of the Mozambique National SFP and its relationship with enrolment, attendance and retention of learners, and estimates the capacity of agricultural production in regard to supplying food for the SFP in future.

Chapter 6. The conclusion and recommendation chapter summarizes the core results of the study and suggests recommendations for possible measures that should be undertaken to improve the role of the SFP.

CHAPTER TWO:

2 Review of related literature

This chapter reviews the literature on the global perspective of SFPs, history and concept. The chapter also goes further in discussing the concept of "Home Grown SFPs", "school feeding and educational benefits", "school feeding and nutrition". It also presents the role of SFPs in enhancing small holder agricultural development and finally reviews school feeding procurement modalities

2.1 Origin of school feeding programme globally

School feeding has been defined as a long standing and popular development assistance program in low and middle-income countries[1]. It has been popular as a safety- net program for achieving the Sustainable Development Goals (SDGs). There are two broad categories: in-school meals and take-home rations; where families are given food if their children attend school. Historically, in-school meals have been the most popular modality for school feeding interventions. According to Akanbi, (2013), school feeding can be in turn grouped into two common categories: programmes that provide meals, and a programme that provides high energy biscuits or snacks to generate greater impacts on school enrolment, retention rates, and reduce gender or social gaps[20]. However, in recent years, there have been indications of a change in thinking about school feeding and many elements of this new thinking are being promoted under the auspice of "home grown school feeding[21].

The rationale behind SFPs based on the use of locally-produced food is that they can provide a regular market opportunity and a reliable source of income for smallholder farmers[8]. Tomlinson (2007) traced the emergence of SFP to the 1930s in the United Kingdom and the USA, with a focus on improving the growth of children. In 1900 the Netherlands became the first country to move the programme to a new level, by incorporating school meals into their national legislation[22]. By the 1930s, the United Kingdom and the United States had also instituted the SFP as part of their national programmes. The USA began the practice of initiating SFPs in Austria as an act of international aid focused on combating the severe malnutrition of children after the Second World War. Since then, SFPs have become a key part of food assistance, relief emergency and development programmes[22].

As a social safety net, SFPs have also gained popularity among political leaders and policy makers in developing countries in Asia, Africa, and Latin America. The 2011, the World Food Prize was shared by John Agyekum Kufuor, former president of Ghana, and Luiz Inácio Lula da Silva, former president of Brazil, for the successful social programs, including SFPs, that each nation had established[23]. Brazil and India have established school feeding programs by passing legislation. Brazil added SFP into its constitution[5], while in 2001 in India, the Supreme Court mandated that all state governments must provide cooked meals in targeted schools[24]. Since then, SFPs have become a key part of food assistance, relief emergency and development programmes.

2.2 School feeding initiatives in Southern Africa

The first school feeding initiative in Africa was established under the auspices of the New Partnership for Africa's Development (NEPAD). This is a vision and strategic framework for Africa's renewal that was adopted by the organization for African unity (OAU)[25]. Among the three activities or initiatives of NEPAD is the Home-Grown School Feeding (HGSF) concept developed within the food security and nutrition programme. Local small-holders farmers were to be given the opportunity to provide schools with the necessary food products[22]. The reason NEPAD gives for this focus on school going children is the improvement of nutritional status in the formative years. Since primary education is compulsory in most African countries, children can be easily reached through the school. Therefore, primary schools feeding enhances enrolment and attendance, which improves literacy (particularly for girls), an improved component of poverty reduction[25]. The second school feeding programme in Africa is the Joint Aid Management (JAM)[22]. This is a South African-founded, non-profit making Christian relief, and development organization with over 22 years‟ experience in sustainable development.

JAM mainly focuses on school feeding assistance to orphans and vulnerable children. They have initiated national feeding programs in five different countries namely Angola, Mozambique, Rwanda, South Africa and Sudan. It distributes 100- 150 grams of food rations to beneficiaries daily. This food ration is a porridge-type blend made of corn, sugar, soya beans and micronutrients[22].

The HGSF has provided governments with an opportunity to develop capacities to run sustainable school meals programmes. As a way to achieve this aim, NEPAD has since been

partnering with various stakeholders including international, national governmental and non-governmental agencies to support governments in delivering school meals.

2.3 Home grown school feeding and its purpose

Home-grown school feeding (HGSF) is an attempt to link agricultural development with school feeding. The principle is to purchase locally/domestically produced food, promoting school gardens and incorporating agriculture into school curricula to stimulate demand for locally produced food market mechanisms particularly in marginal rural areas where such mechanisms do not exist. The Home-Grown School Feeding concept has lately been adopted by many countries, in both high and middle-income countries, as a key approach in the provision of meals in schools. Some advantages have been associated with HGSFPs which includes confining the production and purchasing of food within a community or nation which, in the process raises the possibility of local economic development[26]. This could result in more prolonged business opportunities, thus supporting local service delivery[27]. More than 70% of the food is procured locally in the HGSF model[27].

Another benefit associated with the HGSFP is that of better access to adequate food especially in sub-Saharan African countries[8]. Furthermore, of those benefits, some are linked to profit making while others are more focused on assets creation[8]. The World Food Programme (WFP), favours a local association and relatively shorter distances between the small-scale farmers, the market, and the school, to cut out the expensive middleman and have food available at cost effective prices[28]. The reduction in travelling distances enables the farmers to be efficient in supplying customers with their local produce with no extra and unnecessary cost incurred[29]. Besides, the absence of the middleman means, the schools will also get the product not only relatively fresher but also at reasonable price. Even where prices are higher, the benefits go directly to small holder farming households.

It has been observed that prearranged delivery deadlines in schools are easily met with fresher produce, at cost effective prices and better-quality food produce[30,31]. This could help farmers to increase their productivity, gain access to the market and produce better quality crops. Researchers believe that if the food was bought from local suppliers, who are small scale farmers, for instance, it could help guarantee market availability for them, thereby improving the small holders' living conditions and turnover[29].

The SFPs principally target school age children, while the HGSF has a double effect in that it targets both small scale farmers and school aged children[27]. Through the HGSF, farmers are enhanced not just through their access to school feeding but also through providing the necessary market while also defending them from the rising cost of food[28]. The HGSF model, therefore, offers children safe, wholesome and good quality food while at the same time eliminating universal hunger and poverty through generating sustainable earnings for the smallholder farmers[28].

Upton and Lentz (2011) postulated that purchasing locally saves costs while supporting local producers which benefits faster delivery than food aids[32]. There were significant savings of between 13-50% observed in a study conducted to evaluate local purchase versus food aid in sub-Saharan Africa[29,31].

2.4 School feeding as a social safety net

School meals are recognized worldwide as a social safety net[33]. Estimates indicated that globally, about 368 million children receive a meal at school every day. However, the schools' role in social protection is not tied only to this duty, but also to their ability to be a platform for other initiatives, often serving as a place where all learners can access basic health services and support, including water, sanitation, and hygiene (WASH) education and facilities, which are important for nutrition[33].

The provision of meals to children through school can also provide safety nets for the most vulnerable and hard-to-reach children. These include orphans, children from indigenous communities, those with special needs and children who may be affected by some diseases. Generally, these children, in addition to those from very poor households and those affected by emergency or crisis situations, are more likely to drop out from school due to their inherent vulnerability. Therefore, in these cases, schools can play a pivotal preventative social-protection role, reducing the risk of negative coping strategies that may threaten long-term livelihoods, food security and health[34]. According to Drake et al., (2017), school meal programs can reduce household food needs, freeing up disposable income, thus reducing volatility in household finances[35]. In addition to that, school meals as a social-protection mechanism can be tailored to respond to economic and environmental shocks (e.g., when one part of the country experiences drought or in seasons when less food is available). The SFPs are ideally placed to integrate into strategies to fight hunger, poverty, and malnutrition; and improve health

outcomes. If well designed, an SFP can make a significant contribution to gender equity in education while targeting the social vulnerability of girls[35].

2.5 School feeding and educational benefits

Poor health and malnutrition are important underlying factors for low school participation (i.e., enrolment, absenteeism, poor classroom performance as well as early school dropout). Children must be healthy and well-nourished to fully participate in education and gain its maximum benefits. Developing SFPs can enhance the learning and educational outcomes of school children. Education of good quality can lead to better health and nutrition outcomes for children, especially girls[5].

A study conducted in the USA, showed that providing breakfast to disadvantaged primary school learners was beneficial. Before the start of a school breakfast program, eligible (low-income) children scored significantly lower on achievement tests than those not eligible. Once in the program, however, the test scores of the children participating in the program improved more than the scores of non-participants. In a study carried out in Nepal, it was evident that 5% of the children who were attending school were stunted while 27% of the children were of normal nutritional status[36].

Studies have found that children in poor health start school later in life or may not go to school at all; providing SFPs will enhance early enrolment and reduce dropout rates[37]. In Burkina Faso, the operation of school canteens increased school enrolments, regular attendance and consistently lowered repeater and dropout rates in disadvantaged areas. Higher success rates in examinations were recorded in this area. The closure of school canteens was followed by high absenteeism[38]. A three-month evaluation of an SFP in Malawi recorded a 5% increase in enrolment and 36% increase in attendance[19]. An SFP also assists school committees and local communities in identifying and developing enterprises which can sustain SFPs in future.

2.6 School feeding and enrolment

According to Adelman, Gilligan, et al. (2008), the availability of school meals can increase school enrolment if the program changes the household's schooling decision for some children who would not have been enrolled in school otherwise[2]. For these households to enrol their children, they need to be convinced that the net benefits of participating in the program, exceed the gap between direct and opportunity cost of schooling and the expected benefit of

schooling[2]. Another important point is about the roles that school meals play in encouraging early enrolment.

The SFP contributes to the age of entry in different ways[39]. Firstly, the provision of the meal offsets the cost of educating children by making available additional income for households. When this income effect is large, it can cause households to send their children to school at a relatively younger age. Secondly, the "neighbourhood effect" may also influence the age of the children at entry. That means households sending children to school earlier due to an SFP would create a social pressure and prompt similar action in others.

For instance, a study in 32 Sub-Saharan African countries shows that providing food in school under the Food for Education (FFE) scheme contributed to increasing absolute enrolment in World Food Programme (WFP) assisted schools by 28% for girls and 22% for boys in just one year[40]. After the first year, however, the enrolment showed variation depending on the type of SFP; i.e., whether the provision of food in school was combined with take home rations or was served alone. In those places where on-site feeding and take-home rations were offered together, girls' absolute enrolment kept on increasing by 30% after the first year. However, schools that provided on-site feeding only recorded increases in absolute enrolment, similar to those before SFP was implemented.

A study in Pakistan provided an income in the form of one or two tins of oil to families whose girls attend school for twenty days per month. This study found that, in participating schools, enrolment improved overall while attendance increased from 73% to 95% among participants[41]. A Northern Uganda study, which assessed the impact of alternative methods of FFE delivery on schooling used a prospective, randomized controlled evaluation. Results indicated that in-school meals increased enrolment for those children who were not enrolled at baseline but had reached the recommended age of entry. However, the impacts varied by grade and gender[42].

Most SFPs also help to adjust the age at entry by attracting children at the right age[2]. In most developing countries like Mozambique, children may begin primary education much later than the recommended age for various reasons. For instance, factors such as lack of funds, lack of childcare and little awareness about the benefit of enrolling children can be some of the causes for late entry[3].

2.7 School feeding programme and school attendance

Proponents of SFP believe that school meals can be effective in increasing class attendance because children receive the meal only when they attend school[2]. However, it is important to point out that the opportunity cost of allowing a child to attend school varies across school days and seasons. This cost could be higher than the expected benefit. For instance, in places where child labour forms an integral part of agricultural work during a particular day/season of a year; class attendance could be low. In such cases, school meals may or may not encourage attendance, depending on how the beneficiaries value them. Thus, the value of the meal relative to the difference between the cost and expected benefit of schooling also determines attendance[2]. There are three aspects of nutrition which can influence class attendance. School meals alleviate short term hunger of learners during the school day by providing more nutrients to the child. Secondly, providing the child with a meal that they would not otherwise have had; or replacing a meal that would have been eaten after school with one during school hours[2]. School meals have a short-term impact and enable children to concentrate and learn more easily.

A Jamaican study on the effects of school breakfast showed that overcoming hunger at school, leads to better learning. School meals may also lead to nutritional improvement in a child over the long run. Improved nutritional status as a result of school meals, could, in turn, enhance a child's physiological capacity for learning, improving learning and the desire to attend school. School meals can also reduce morbidity through improved nutrition and consequently enhance attendance. Adelman, Gilligan, et al. (2008) are of the view that morbidity is a cause of absence in many developing countries and school meals help children to learn longer. School feeding can increase micronutrients intake and strengthen children's immunity avoiding infectious diseases in children[2]. In essence, therefore, there is both a short-term benefit (improved concentration) and in the long-term retention of learners.

A mid-term evaluation of the Ethiopian FFE program reported that the increase in school enrolment and attendance recorded might also be due to external factors, by changing attitudes of parents towards the education of children[43]. A study in New Zealand also showed there were some reasons that affected class attendance. These factors related to learners' themselves, to the school or the learners' family circumstances. School or teacher factors could also affect school attendance. For instance, teaching quality, the school culture and school-community links[44].

2.8 The role of school feeding in promoting equity

The perceived value of education, the availability of employment opportunities, the direct and indirect cost of schooling and the availability and quality of school facilities, are factors that can influence the parent's decision to enrol a child at school. Food incentives offered to learners compensate parents for direct educational costs. It was observed that implementation of SFPs was associated with an increase in enrolment and retention, particularly for girls[45].

Studies have reported a strong relationship between education and poverty, particularly inequality. As postulated by Oyefade, 2010, there are many factors with a significant impact on school attendance and education quality; particularly early childhood malnutrition, deprivation based on gender and income inequality[45]. In countries where SFPs have been implemented, research has revealed that it has increased enrolment and attendance rates over the years[20]. For instance, in Bangladesh, the research carried out by the International Food Policy Research Institute on the effects of SFPs found that it raised school enrolment rates by 14.2%, reduced the probability of dropping out of school by 7.5% and increased school attendance by 1.3 days a month. In Pakistan, an SFP provided one or two tins of oil to families whose girls attended school for twenty days per month. In its pilot phase, the oil incentive programme demonstrated that it could make a significant contribution to full attendance. In participating schools, enrolment improved overall while attendance increased from 73% to 95% among participants.

A desk review conducted by World Food Programme (WFP) found that in 2008; 500.000 orphans and children affected by HIV, in nine countries, had benefited from WFP school meals. Take Home Rations (THRs) or a combination of both, encouraged learners to attend school thereby reducing the burden on their households[14].

Oyeniran (2014) observed that schooling and institutions regulating access to education in developing countries; contributed to the class and social divide in urban areas[46]. Equally, the educational opportunity was driven by unequal and asymmetric political decision-making structures, whereby people from poorer backgrounds tended to bear the brunt of national and local policies[46]. He stated that availability of SFPs did not automatically result in higher enrolment numbers; as some families could not send their children to school, because of the high cost of fees, textbooks and uniforms[46].

2.9 School nutrition and alleviation of hunger

As observed by Bundy, (2017) enhanced nutrition and health status of primary school children contribute to improved learning and decreased morbidity, paving the way for healthier lives[47]. Therefore, SFPs not only alleviate child hunger in schools but also enhance nutrition, particularly when the food is fortified with micronutrients. Thus, SFPs raises the potential to improve a child's health, school performance, and educational attainment.

Many children around the world from low-socio-economic backgrounds, start school stunted, or suffering from multiple micronutrient deficiencies. Nutrition and diet-related problems in children are also prevalent in middle and high-income countries[48]. The International Food Policy Research Institute, (2016) mentions that increasingly, children are suffering from several forms of malnutrition, ranging from undernourishment to excessive weight or obesity, with both extremes often occurring in combination with micronutrient deficiencies[49]. Therefore, SFPs provide a unique opportunity to reach children on a large scale to prevent and manage these various forms of malnutrition[49,50]. Children who have participated in SFPs influence their families and younger siblings, which can potentially contribute to reducing the number of children starting school already malnourished.

When school feeding targets preschool children, it can help give a child a healthy head-start and pave the way for a promising future. It is reported that poor nutrition in early childhood affects cognitive development and learning potential; poor health is an additional barrier to education[15]. School feeding should be seen as part of a continuum that supports nutrition for primary school-aged children. It does not, however, directly target poor nutrition in pregnancy, infancy and early childhood[15]. Recent studies in Kenya and Uganda have shown that both in-school meals and take-home rations (THRs) can reduce anaemia[2].

Yunusa (2012) showed that learners in SFP were more likely to improve their performance because it enabled them to to attend school regularly and study more effectively[51]. In Jamaica, children in Grade 2 scored higher in arithmetic when they started being fed at school. It was however observed that although SFPs motivated parents to enrol their children in school, its impact on academic performance was mixed and depended on several factors. Based on this, Uduku (2011) was of the opinion that SFPs would best improve the performance of learners when coupled with adequate learning materials, physical facilities, and teacher motivation[21].

Patton et al. (2016) asserted that schools offer a fundamental platform from which to realize multiple benefits for children and their communities while helping to achieve the Sustainable Development Goals (SDGs)[52]. Furthermore, SFP interventions can catalyse community development, bring about social protection and economic empowerment. They can also influence agricultural production systems, to deliver diverse and nutritious foods. By providing a better health and living environment, SFPs have the potential to support education, and underpin mainstream nutrition activities in communities and advance child development[52].

2.10 School feeding and cognition

Restoration of micronutrient requirements and energy intake are known to have an impact on attention and motivation[15]. Jukes, Drake, and Bundy, (2008) reported that energy intake and iron intake could have an impact on hyperactivity, withdrawal, nervousness, hostile behaviour and happiness[15]. Studies have also reported the benefits of nutrition on the development of cognition. For instance, in South Africa, an SFP provided a soup containing iron and vitamin C to 350 schools in an area of low socio-economic development on the Cape Peninsula, and results showed that initially 12% of six to seven-year olds and 20% of eight to twelve-year-old children showed low weight-for-age, and 49% and 31% were deficient in iron. The provision of soup to these learners potentially helped to improve the general level of their nutrition and health. Therefore, adequate nutrition plays a huge role in the development of an individual's full physical and intellectual potential.

2.11 School feeding and socio-economic benefits to the community

The SFP is recognised as being very powerful in reducing hunger and malnutrition among children, as well as boosting local food production. In this way, SFPs can stimulate and also bolster local economies and create job opportunities around the schools. By providing a structured and predictable demand, SFP has the potential to improve the economic lives of local farmers[53]. For smallholder farmers, local purchase of food for SFP is seen as a bridge that connects them with local markets thus benefiting children and the local economy at the same time[54].

The Brazilian, Ghanian and Nigerian experience of local agricultural production as a complement to SFPs results from the success of the HGSF. For instance, in Brazil, family farming has benefited from the requirement that at least 30% of food used in school meals must be bought from local family farms and rural family entrepreneurs. The example of women's

empowerment in Ghana is notable, where they manage catering businesses that purchase, prepare and serve school meals for nearly 2 million children, although the linkage between those actors and local smallholder farmers still presents challenges[54]. In Nigeria, the home-grown O'Meals SFP has created jobs for thousands of youths and women[26,54].

When well designed and supported by an appropriate institutional, political and legal environment, and implemented with strong cross-sectoral coordination, SFPs can bring benefits across multiple sectors, providing opportunities to involve a multitude of community actors as well[6,8,26,54,55].

Overall, SFPs could lead to the development of a value chain and strong market linkages in Mozambique that will boost domestic production, employment opportunities and improve the rural economy.

2.12 School feeding and community participation

Strong linkages between schools and neighbouring community for SFPs implementation are advantageous[56]. Implementation of SFP is more successful when communities are consulted when designing the programme. Further, Nketiah (2011) pointed out that SFPs are important as they can increase contact and hence communication between parents, teachers, and officials, provide parents with an opportunity to become aware of what goes on in schools and add value to education[57].

A study carried out in Emuhaya in Kakamega County in Kenya revealed that a needs assessment before the programme commencement and having the community included in the SFP as one of the priorities in their plans, was key to the success of the programme[58]. Involving all stakeholders is necessary for successful implementation of a programme. Also, the goals and objectives of a programme can only be successfully met if community members and interested citizen create a sense of ownership of the program. However, this is possible if they are invited and motivated enough.

A programme with strong connections between government and the community ensure the sustainability of the programme as well as improve educational outcomes[26]. As a result, each SFP is recognised for retaining elevated involvement rates, enhanced school attendance and motivating community members to be part of their children's education and execute their roles fully. In many African countries, sustainability of the SFP is the responsibility of the Ministry

of Education[27]. Meanwhile, the SFP lends a hand to societies and communities, to better equip them to be able to eradicate hunger and malnutrition[56].

The Gambian case is an example, where parents and teachers have supported the implementation of school gardening to supplement children's diets through the HGSFP. This is a model of community involvement in the SFP provision[56].

2.13 The procurement modalities of school feeding

A clear definition of the food procurement mechanisms is a crucial part of the implementation of SFP. The main aim of any food procurement mechanism is the timely, uninterrupted supply of quality food for an SFP[59]. Food procurement modalities may involve regulatory frameworks that specify direct links with smallholder farmers. In other cases, links involve interactions with traders (middleman). This refers to food sourcing[60].

The responsibility for management of SFP may lie with the education sector, or independent institutions, particularly where the program is seen as a political priority[5]. In other cases, the program may be viewed as a multisectoral intervention, crucially linked with the education sector, but implemented with agriculture, health, or local government[5].

There are two main ways or models in which food is provided to school feeding programs:

- Central management model;
- Decentralized insourced model.

2.13.1 Central management model

In this model, the overall management responsibility of the school feeding program is at the National level. Therefore, the National government will use a third party, such as contractors and traders from a private company, to implement all aspects of the service delivery of school feeding throughout the country[5]. Centralized implementation is not as favorable as SFPs that are based at school level[5].

2.13.2 Decentralized insourced model

This model involves redistributing functions, resources, and responsibilities away from the central government to the local or school level. The management and control of the supply chain then take place at the school level and is performed locally by the district or school authorities. Decentralized supply chain management is performed internally within the local government or the government school[5].

Currently, most African countries use a decentralized, or bottom-up approach that relies heavily on local structures[25]. Decentralization allows greater room for creative, albeit informal, implementation to respond to local needs and contexts, which in turn may foster local community involvement. For instance, Nigeria's decentralized, informal procurement system, allows each school management committee to purchase foodstuffs and develop menus that reflect local dietary patterns and traditions. Such services are better able to use locally adapted technologies, support coordinated community action, and promote partnerships.

Although this model has advantages, it also raises certain important issues. Decentralization may result in uneven implementation. Ghana's school feeding program, for instance, although rolled out nationwide under high-level political support, shows differences at regional, district, and school levels in administration structure, procurement practices, menu development, and meal preparation[59]. This has been observed in Brazil, India, and South Africa, where a diversity of practices can be observed at each implementation level[27]. Communities and schools with greater resources, political leadership, or local initiatives, may have stronger programs, creating regional disparities. Communities most in need of SFPs may be left out. The decentralized model places more responsibility on lower levels of the government such as district level and draws on the strengths of existing community-based organizations, farmer-based organizations, school management committees and village groups[5].

2.14 The theoretical and conceptual framework

The theoretical framework guiding the study was adopted from Bundy, Burbano, Grosh, Gelli, Jukes, and Drake in 2009. It was adopted because the model titled HGSFP Theory (Fig. 2.1) analyzed the relationships between school feeding programmes and school enrolment, attendance, retention and agricultural development[5]. The adoption was also deemed fit because some of the variables espoused in the model involving short-term hunger alleviation, engaging in learning, improving children's nutritional status, improving cognitive skills and behaviour and educational achievement, although were viewed unrelated to the current study objectives, were considered as prerequisites for learners' enrolment and attendance which were the foci of this investigation.

Kiamba (2013) explained this theory by saying that HGSFP has three target groups: school children, the small-scale farmers (food production) and the community stakeholders across gender dimension (food preparation as a job opportunity, food security)[7]. The theory suggests several societal developmental changes as induced by HGSFP including several potential

benefits and opportunities: School feeding creates additional demand for food commodities, – a demand driven development intervention; provides a stable and predictable market for farmers; reduces risk and increases investment behavior and overcomes barriers to market entry**.** With regards to the target of HGSFP, Espejo et al. (2009), asserts that school feeding programmes principally target school-age children.[26] According to the theory, HGSFP programmes can increase school attendance by lowering the opportunity costs of attending school and providing additional incentives to engage in formal education[5]. This leads to more time spent in school and more time spent towards learning. It also asserts that HGSFP can improve children's cognitive functioning and attention span through alleviation of short term hunger. This, in turn, leads to better health and better resistance to infectious diseases and illnesses that would keep children from attending school. Thus, better nutrition indirectly improves educational achievement by increasing school attendance for the children involve[5].

Figure 2.1 below summarises the interaction between a local farmer and the need for local school children.

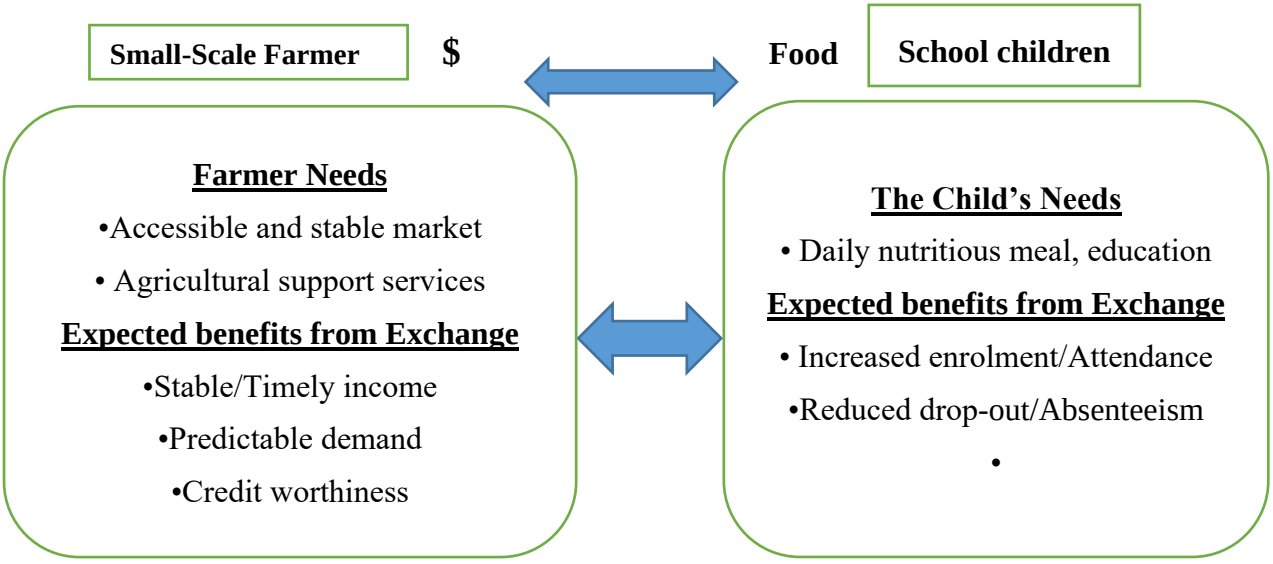

Figure 2-1: Home Grown School Feeding Programme Theory

Source: Adapted from Bundy, Burbano, Grosh, Gelli, Jukes, and Drake in 2009

2.15 Summary

School children from disadvantaged backgrounds should be provided with opportunities for them to be able to achieve higher levels of needs. Education systems should be designed to removing barriers of any nature that prevent children from realising their potential. One of these barriers is malnutrition. Internationally, SFPs provide the nutrition required for children

to learn effectively. The literature also highlights the possibility of linking SFPs with local agricultural production.

CHAPTER THREE:

3 Background on Mozambique

3.1 Mozambique country context

Mozambique is, according to the Food Agriculture Organization (FAO) definition, a Low-Income Food Deficit Country (LIFDC) with a population of about 27,843, 933 million people in 2017, over half of whom are under 15 years of age[61]. According to the United Nations Development Programme (UNDP), Mozambique remains one of the poorest countries in the world; it is ranked at 180th out of 188 countries in the United Nations Development Programme's (UNDP) Human Development Index[62]. When using the UNESCO poverty measure of income below $2 per day, the poverty rate is a staggering 81.8%[10] with a gross domestic product (GDP) per capita (PPP) of $16, 39 USD in 2014[62]. Also, the country faces political uncertainty with the unsolved political-military conflict between the government and the opposition party RENAMO[63]. At a country level, Mozambique has seen remarkable progress regarding access to school (net enrolment ratios increased from 44 in 1990 to 87.7 in 2013). However, Mozambique is the lowest ranked country in the world concerning mean years of schooling, at just 1.2 years; compared to the average of the Least Developed Countries of 3.7 years[9]. Many children enter in grade one but do not complete the full seven years of primary education[64].

3.2 Agriculture in Mozambique and its role in the national economy

Approximately 70% of all Mozambican citizens live in rural areas[65]. Mozambique has 36 million hectares of arable land, although only 5.7 million are used by about 3.7 million small and medium-sized farms[65]. Mozambique agriculture is largely driven by smallholder farming and contributes almost a quarter of the country's GDP and was worth approximately US$4.2bn in 2014. The dollar value of agriculture grew by a compound annual growth rate (CAGR) of 10.3% between 2000 and 2014[63]. However, agricultural productivity in Mozambique is among the lowest in the world[62]. The major crops produced are maize and cassava which are the major staples; other food crops include sorghum, millet, rice, beans, groundnut, sweet potatoes and a wide variety of vegetables. Cash crops include cotton, tobacco, cashew, coconut, and fruits[63].

Production is carried out using a low level of technology and depends on household labour. Fertiliser use is minimal, and access to credit is limited, so most depend solely on their meagre capital. Crop yields are not only low but also highly variable as most farmers depend on rain-fed farming. Rainfall fluctuates considerably from year to year and season to season, but usually, Nampula province and the country, in general, has a uni-modal rainfall pattern and therefore has only one farming season, lasting from September to March[63]. For the rest of the calendar year, many farmers in the province are idle or resort to other income-generating activities. In the area where the rainfall pattern does not allow for year-round production; and productivity is generally low; the population is exposed to chronic food insecurity.

According to the 2009 UNDP analysis, an estimated 60% of the population, experienced food insecurity or were highly vulnerable to food insecurity[62]. Those most affected were rural populations. The food security assessment also showed that food access was a primary constraint: food was only available at markets when harvests were good. Thus, populations faced constraints in both food access and utilisation.

Mozambique's agricultural policy revolves around developing an agricultural activity to achieve food security through the diversified production of products for consumption.[65]. This implies enhanced food security and equity, emphasis on agricultural mechanization and intensification of production[65].

The intervention involves school feeding implemented by the government of Mozambique. The NSFP was launched in 2013, targeting 12 schools located mainly in the four most vulnerable provinces. The targets of the SFP were public primary schools in rural districts and children attending these schools. Primary basic education in Mozambique comprises of seven years of primary schooling. The official schooling age for primary school children is 7 to 12 years. Considering the repetition rate, early and delayed entrants uncertainties and misreporting of age, the target group for intervention consists of children aged 7 to 18 years.

3.3 The National School Feeding Programme in Mozambique

The Government of Mozambique started an NSFP in late 2014, using the HGSF concept. The immediate objectives of the NSFP also known as "PRONAE" were to contribute in reducing short-term hunger and increase enrolment, attendance and reduce dropout[25]. In the long-run,

the NSFP sought to link a sustainable SFP with local food production by local smallholder farms to reduce malnutrition among primary school children in the country and enhance food security in rural households[25]. Using locally produced food for the NSFP was also meant to provide markets for local farmers, to enhance productivity and improve incomes, in line with the government's policy of reducing poverty[66]. Food was expected to be bought from the local community and cooked at schools[67]. This government-led SFP is the subject of this case study; as its effect is not known yet.

Mozambique was one of the countries in Sub-Saharan African selected to pilot NEPAD supported Home Grown School Feeding Program (HGSFP) in an effort to transition toward a more sustainable and nationally integrated school feeding alternative and in particular shift the financial responsibility[25]. The pilot programme run from January 2014 to December 2015, in 12 primary schools located in four different provinces of the country and was intended to last for two years[25].

The initiative is intended to be scaled up as a phased approach to cover all primary schools in the country and benefit many more children. The SFP provided learners in public primary schools, with one hot, nutritious meal per day in school, covering at least 30% of calorie requirements and 20% of vitamin and mineral needs using locally produced and procured food items[68].

Complementary activities intended to be part of the package were provided, through a partnership with other governmental institutions and development partners. These include the provision of de-worming tablets, water and sanitation in schools, health and hygiene education and HIV/AIDS prevention[25]. The Ministry of Education and Human Development has the oversight responsibility for the NSFP. Collaborating ministries in Mozambique that ensure the sustainability of the NSFP include the Ministries of Health, Industry, Agriculture, Social Protection; and Finance and Economic Planning. Other strategic and technical partners for the programme include the Brazilian Cooperation Agency (ABC) and World Food Programme (WFP). The Mozambique NSFP relies on the continuous support of these stakeholders, within the framework of the Tripartite Agreement. The Ministry of Education and Human Development is working with the Ministry of Finance to establish a specific budget line for this program, within the framework of the State Budget. An independent assessment conducted at the end of 2015, outlined some achievements and challenges. Achievements include general

acceptance of the programme by local authorities and the community; commitment and willingness by the Government to strengthen school feeding through the formulation and adoption of a specific national program; progressive capacity building (training of staff); farmers in some beneficiary communities are becoming more interested in becoming food suppliers for SFP, and they have also started to produce crops in response to the programme's needs[68].

The programme, however, faces several difficulties. Central government budgetary allocations and releases have been slow and, in some cases, inadequate; the governance structure and procurement systems suggested for the programme have been sidelined; monitoring and evaluation of the programme are still quite weak[25]. The Education Ministry's SFP constitutes a major shift from the in-kind food donation provided by partners to the more locally sustainable, SFPs. The SFP is envisaged to become one of the core pillars of poverty reduction in poor rural communities of the country. It will ensure food security at the farmer household level and contribute to reduced malnutrition, eradicating extreme poverty and hunger. These and other challenges need to be addressed to improve programme implementation efficiency and effectiveness.

3.4 Programme objectives and targeting

Generally, SFPs target children individually or schools (i.e., the school becomes the "distribution point" for all the children who are enrolled). Traditionally, SFPs target primary schools, although they also support pre-schools as part of early childhood development programmes and children attending non-formal education[69]. The size of the target group should be precisely estimated to procure sufficient foods. A quick and narrow way of estimating is to state that all school-age children who are chronically hungry when attending school, should benefit from an SFP[69]. Therefore, the NSFP in Mozambique criteria include:

- the willingness of a community to provide basic infrastructure (e.g., kitchen, storerooms and latrines);
- poverty status of the district and community;
- low school enrolment and attendance and gender parity index;
- high school drop-out rates;
- poor access to potable water.

Using the above criteria, the Ministry of Education and Human Development (MoEHD) and partners, worked with the district's leadership in the elaboration of an initial list of districts and schools that met the criteria of poverty, high drop-out rates, and gender disparity. The list guided the selection of districts and schools across the country.

3.5 Policy and legal framework in Mozambique

The Ministers Council approved the NSFP in the 14th Ordinary Session held on May 14, 2013. A specific law does not back school feeding. The programme is well embedded in the national legal and policy framework, which guides interventions in the school feeding by the Government. Public food purchases, particularly local production, are the focus of the program and are regulated by Decree No. 15/2010 of May 24.2010[18].

The NSFP has been designed to complement national and international development strategies and policies. The Government's Five-Year Program (PQG 2015-2019), which is the macro policy instrument that guides the intervention of the executive, defines the objectives and strategic priorities for the respective quinquennium. The development of human and social capital is one of the five strategic priorities. It includes child protection and equitable access to education. In the case of education, this program stresses the need to strengthen and modernize the education system but does not place school feeding as a priority in this sector. It emphasizes the promotion of food and nutritional security and education as a responsibility of the health sector and for the development of the agricultural sector.

The Food Security and Nutrition Strategy (FSNS) was approved in 1998 (FSNS I) and revised in 2007 (FSNS II, 2008-2015), through Resolution 56/2007 of 16 October. The strategy states that FSNS and the right to food, are central elements of the different sectoral strategies in the fight against hunger and poverty at all levels of the country. The strategy recognizes that food and nutrition insecurity lower levels of school achievement, particularly in children. School feeding is one of the priorities for ensuring access to food and for improving the nutritional levels of this vulnerable group, with institutional responsibilities being assigned to the Ministry of Education. This strategy proposes intersectoral (different sectors of Government) and multilevel intervention (central, provincial, district) to address the structural causes of food and nutritional insecurity in the country.

At the sectoral level, the MoEHD is responsible for school feeding. The strategic plan (PEE, 2012-2016) places school feeding as a priority for the education sector, recognizing that

adequate nutrition is essential for the good performance of learners and proposes that the school environment include, among others, aspects such as access to potable drinking water, sanitation, and a balanced diet. This plan links school feeding with social protection and stipulates the gradual introduction of an NSFP in those districts with the highest levels of vulnerability to food insecurity, school drop-out rates, and low achievement.

At the international level, Mozambique has joined other African governments in their commitment to strengthening NSFP based on local production under the NEPAD. It was in this context that HGSFP was launched, then integrated into the Comprehensive African Agriculture Development Program (CAADP), of which Mozambique is one of twelve pilot countries. This program aims to increase the direct access of children to school feeding, based on local products. To do this, it places as a basic principle the encouragement of family farming. It aims at diversifying local production and its integration into the programs; diversification of diet, fortification and supplementation; as well as the mobilization of resources and empowerment of local communities. Along the same lines, Mozambique was also selected as part of a WFP initiative, to join a group of twenty pilot countries, for the global Purchase for Progress (P4P) initiative, aimed at directing procurement of food products from the domestic market through direct purchase from the farmers. Mozambique was also included as one of the five pilot countries to implement the Purchase from Africans for Africa (PAA) initiative; that aimed to adopt a double perspective focused on strengthening family farming and creating markets for its products.

In 2012, Mozambique approved the Food Security Strategy (ESAN-CPLP) of Portuguese Community Speaking Countries. This strategy aimed to contribute to the eradication of hunger and poverty; by strengthening coordination among member states, the governance of sectoral food security and nutrition policies; and programs based on the human "right to food" perspective. One of the main commitments assumed was the need to strengthen the public purchasing mechanisms of family agriculture, to supply SFPs.

3.6 Financing of the National School Feeding Programme

The Ministry of Education and Human Development is working with the Ministry of Finance to establish a specific budget line for the NSFP within the framework of the Mozambique State Budget. It is hoped that the existence of a specific budget line for the NSFP would facilitate a progressive allocation of public resources for school feeding, depending on the budgetary

availability for each economic year, supplemented by contributions from donors and international partners. However, the pilot program, which was carried out between 2014 and 2015, has been funded through the above-mentioned "Memorandum BRA / 04/044 of 2010" and Country Program CP funds 200286 (2012-2015), of WFP, totalling the US $ 16 million. For strengthening and sustainability, it was expected that the community should be mobilized to contribute, through the provision of labour and supply of some goods necessary for the operation of NSFP, such as firewood, charcoal and burn blocks, construction of warehouses, canteens, and school toilets.

3.7 The procurement modalities of NSFP in Mozambique

There are two procurement models: district based and a school-based model. The NSFP advocates for a school – based model, chaired by the head teachers or the school principal, to oversee procurement, cooking and the feeding of the children [18].

3.7.1 District-based model

The first procurement model used by the NSFP was the district-based procurement model using an open district bidding system. The tender specifications were developed at the NSFP Unit at the district level. Specifications were then sent to the acquisition management and execution unit (UGEA), which provided a tender number and announced the tender. The criteria for successful applications were based on the ability of the service provider to perform the task. This process was subject to the legislation, in particular, Decree No. 15/2010[70].

After that, the evaluation committee evaluates each application, based on a set of criteria that are used to select and contract service providers. After that contracted service providers are entrusted with the responsibility to supply the schools with the food, based on a set menu and calculated on the number of children to be fed per school and the quantities to be supplied for the number of feeding days per month. Payment procedures using a district system in the districts mentioned above were as follows:

- The National Department of School Health and School Food transfers NSFP funds to the province;
- The province monitors the entire NSFP budget for the province and transfers funds to the district bank account;

- The district monitors the entire NSFP budget for the district and transfers funds to the service provider's authorized bank account for valid claims and tax invoices received;
- The district NSFP unit claims and authorizes payment to the contracted service provider; and
- Per the district model, schools are responsible only for the preparation and delivery of meals; to check the invoices in the fixed menu and to sign the delivery form.

3.7.2 The school-based model

The MNSFP guidelines also suggest another model in which all the food items could be procured at the school level and cooked on site. The key element of the school-based model is its grass-roots decision-making process. Procuring and storing food is carried out at the school and community level. The school is responsible for selecting and contracting suppliers and ordering and receiving supplies using a quotation system. In this model, (school-based), funds would be transferred directly to schools[67].

The schools would request quotations from suppliers and compare these quotations on a like-for-like basis. Lastly, they would evaluate and select the supplier they intend to use. One of the advantages of this model is because there is no intermediary and the systems are more transparent and efficient, and there is ownership of the programme by the schools and surrounding community. This model has a direct link with local farmers, the community, and school authorities. The model has community involvement as key in the sustainability of the programme.

Payment procedures using a school-based model are as follows:

- The National Department of School Health and School Food transfers NSFP funds to the province;
- The province monitors the entire NSFP budget for the province and transfers funds to schools directly;
- Each school has a separate NSFP bank account;
- Schools select their supplier by requesting quotations, comparing these quotations, evaluating and selecting the supplier they intend to use. These comparisons also delimit or describe the participation of farmers.
- After selecting their preferred supplier, they enter into a contract with the supplier;

- After that, the supplier delivers food supplies based on a set menu and learners enrolment;
- The NSFP Unit at the district level monitors the feeding at school; and
- School officials process NSFP claims and authorize payment.

3.8 Summary

The provision of meals to learners has been reported to be the best way of alleviating hunger and malnutrition while supporting education, health, and community development. The HGSFP, a recently advocated feeding programme (FP), promotes the supply of food by local small-scale producers and helps to develop local markets, thus, stimulating the procurement of food from local farmers direct to schools, thus reducing transportation and commercial costs while obtaining better quality, fresh and varied nutritious food. Additionally, the HGSFP improves communication between, parents and teachers, which in turn has favourable benefits for the quality of education and nutritional awareness as parents, become sensitised about what goes on at the schools. The Mozambique NSFP is intended to support and address the right of all children within the country regarding health care, nutrition, and education.

Government and its partners (NGOs and local communities) play a key role in the development and sustainability of any feeding programme. The HGSFP involves various stakeholders, resulting in a nationally owned feeding programme through sourcing food from local small-scale farmers. The HGSFP, benefits not only the leaners but also local producers and the entire community, thus boosting the local economy through increased income.

CHAPTER FOUR

4 Research Design and Methodology

This chapter presents the procedures and methods that were used in the study. It focuses on the research design, study area, target population, study variables, sampling techniques and sample size. It also presents the research instruments, pilot study, reliability and validity, data collection techniques, data analysis and ethical considerations. Finally, a summary of the chapter is given.

4.1 Research design

The research design is a distinct plan for how a research problem will be approached[71]. In this study; mixed method research was applied, which is a combination of qualitative and quantitative approaches. According to Punch (2009), mixed method research refers to the empirical research that involves the collection and analysis of both qualitative and quantitative data.

It is significant to point out that the mixed method research (quantitative and qualitative) has numerous strengths among which the ability to confirm findings, test theory and obtain breadth and depth on a research topic. The major setbacks include a lengthy time to conduct the study, complexity in putting the method into practice and its cost implications. Thus, proper planning and appropriate design and strategy are required to carry out the mixed method research effectively and efficiently[72].

This design enabled the researcher to collect two types of data and also gain perspectives of data derived from different paradigms through a single research project[72]. Khandker et al. (2010) argue that making use of the mixed method approach assists in overcoming qualitative weaknesses because the quantitative measures offer generalisability and statistical significance[73].

Consistent with this view, Creswell (2013) state that the use of both the quantitative and qualitative approach to research helps to look at a problem or phenomenon from multiple lenses to enhance and enrich the meaning and understanding of the phenomenon[72].

To answer the research question, this study followed a two-pronged research design, Cross-sectional comparative analytical design, and a case study design.

4.2 Research strategies

The research strategies are described in more detail below:

4.2.1 Quantitative approach:

Learner questionnaires: a descriptive cross-sectional study design was applied to data derived from learners from SFP schools. This approach was found appropriate because there was no intervention. The researcher wanted to accurately depict the perceptions and opinions of the learners from SFP schools.

School records (enrolment and dropout data): analytical cross-sectional design using a comparative approach was applied. In this study, school records were collected in one subset of a population of eight primary schools. Of the eight schools, four schools implemented an SFP in 2014 and 2015, while four schools did not have SFPs.

Included in this was secondary data on learner's absence from school. A retrospective cohort was applied as the study design. Attendance records of randomly selected Grade 3 learners were accessed from eight primary schools (200 records from SFP schools and 200 from non-SFP schools) in Nampula province, Mozambique. Of these eight schools, four implemented an SFP in 2014 and 2015, while four schools did not. School records from 2013 for all eight schools were used as a baseline for comparison.

4.2.2 Qualitative approach

4.2.2.1 Case study design

A case study is "an empirical inquiry that investigates a contemporary phenomenon within its real-life context when the boundaries between phenomenon and context are not evident and in which multiple sources of evidence are used"[74]. It may involve an intensive investigation of a single unit or the examination of multiple variables over an extended period in an attempt to understand the influences of social systems on subjects' perspectives and behaviour[74]. A case study was seen to be the appropriate approach to assess whether the local farmers in the study area had a capacity to produce enough foodstuff to supply to NSFP market.

4.3 Research Methodology

A research methodology pinpoints the research process and the kind of tools and procedures to be used. According to Denzin and Lincoln (2011), it follows on the research design phase and entails the methods of collecting and analysing empirical material[75].

4.3.1 Study area and site selection

4.3.1.1 Study Area

This study was conducted in Nampula Province of Mozambique. Nampula is located in the upper region of Mozambique with rugged mountains and forest. In 2017, Nampula province had a total population of 5,008,793 people occupying an area of 79,010 km[76]. It borders three other provinces: Cabo Delgado to the north, Niassa to the northwest and Zambezia province to the southwest. The main activity practiced is agriculture, although mainly subsistence[76]. Agriculture provides occupation for about 90% of the population of Nampula, of whom 85% rely on crop production. The major food crops grown in the Nampula province as a whole include maize, cassava, and beans whereas the main cash crops grown vary from one livelihood zone to another but usually include cotton, tobacco and soya[76].

Nampula province faces several challenges which include "population growth, deforestation, insufficient rainfall, and dependency on relatively expensive agricultural inputs that require regular and adequate rainfall for production[76].

Educational indicators in Nampula province are among the poorest in the country. The province is experiencing persistent high dropout rates from primary education learners[9]. Nampula is populated mainly by poor households who are dependent on subsistence agriculture.

The languages spoken in Nampula province are Portuguese and Macua; both are official national languages. However, Macua is more commonly spoken in the study area[76]. A map of Nampula province is shown in Figure 4.1 below

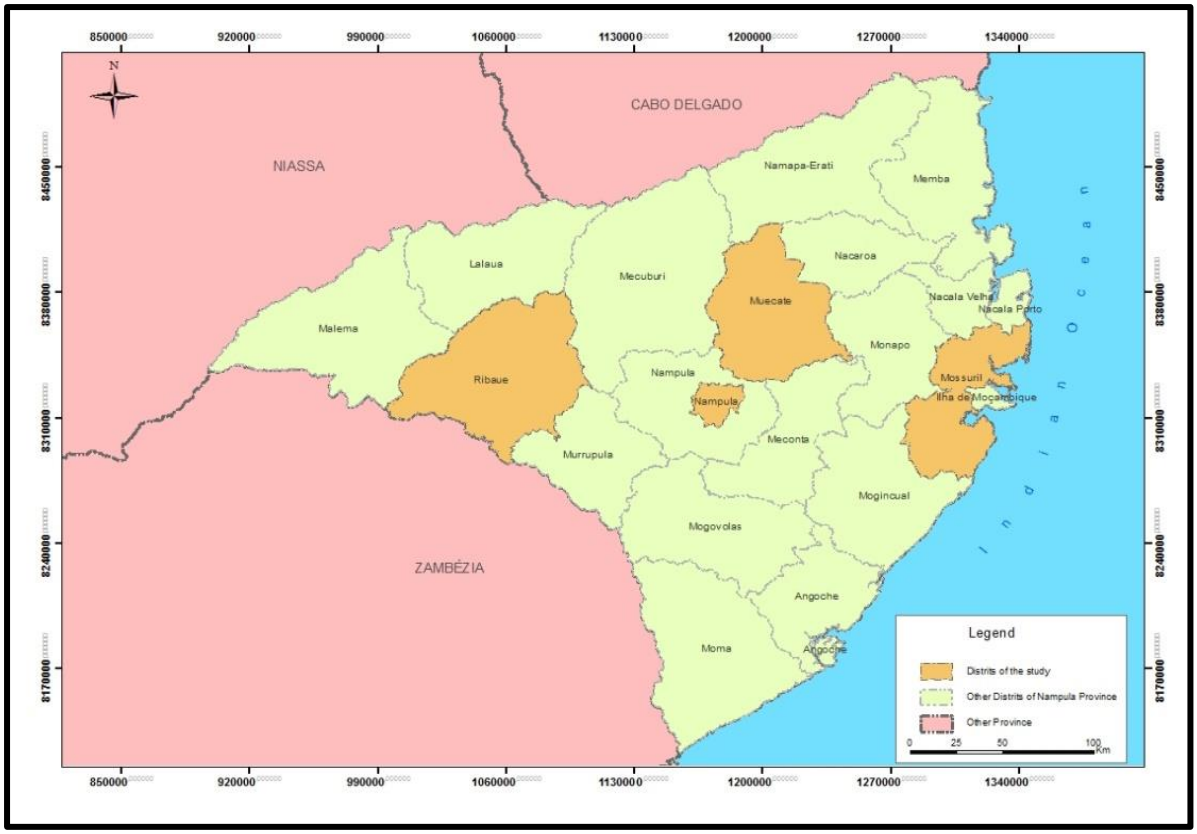

Figure 4-1: Map of the study area: Nampula province

Source: Database of the Mozambique National Institute of Statistic, 2016.

Notice that the shaded areas in the map show the four districts that constituted the study area.

4.3.1.2 Site Selection

The site for the investigation was Government primary schools located in four districts of the northern part of the Nampula province of Mozambique. The study was comprised of eight schools, where four schools were implementing SFP, and four schools were not.

Inclusion and exclusion criteria were that, firstly, non-participating schools were in similar areas but not so close to participating schools that the SFP would have influenced them. Secondly, the learners in the comparison group shared a similar socio-economic background to those in schools with SFP.

Table 4-1: Schools purposively selected for the introduction of the NSFP, or as a comparison for non-introduction, in different districts of Nampula Province

Districts	Schools selected for NSFP	Schools selected for comparison
Rapale	EPC Niapala	EPC Morozone
Ribaue	EPC Iapala Sede	EPC Nampalaca
Muecate	EPC de Muecate Sede	EPC Minicane
Moussoril	EPC de Muaualo	EPC Nananchira

Source: own compilation based on information from NSFP (2013)

4.4 Population and Sampling

4.4.1 Population

The target population for the school feeding intervention were public primary schools of rural districts and children attending these schools. The study population was comprised of 8 schools, where 4 schools were implementing SFP and 4 schools were not. All 8 schools were purposively selected from the same catchment area and from a similar environment. Inclusion and exclusion criteria were that, firstly, non-participating schools were in similar areas but not so close to participating schools that they would have been influenced by the SFP. Secondly, the learners in the comparison group shared a similar socio-economic background to those in schools with SFP.

4.5 Sampling Procedures and Determination of the Sample Size

4.5.1 Sampling Techniques

Multi-stage sampling was used as a sampling technique at different levels to select the respondents. Firstly, a purposive sampling strategy was used to select the study province (Nampula) where the intervention (NSFP) has been implemented. The required province had to have a higher number of Districts selected for the intervention than others.

Secondly, a purposive sampling procedure was also used to select the four NSFP schools. For the control of homogeneity, and for comparison purposes, a similar number of primary schools not implementing the NSFP were randomly selected for the study through the balloting technique. The comparison schools were selected from the same catchment area and similar environment

as the intervention schools. The children in the comparison group shared a similar socio-economic background to the ones who received the feeding programme.

Thirdly, at the school level, grade 6 and 7 were purposefully selected for the study and individual learners were selected by a simple random sampling technique through class lists of the intervention schools. Grades 6 and seven learners were preferred for administering the questionnaire based on the fact that they were able to read and write well enough to provide the necessary information to the interviewer and they were available for almost the entire period of this study for purposes of making follow-up whenever necessary.

4.5.2 Sample size calculation for learners in the NSFP

To determine the sample-size of the learners the researcher used the following formula and parameters.

95% Confidence Level; Z = 1.96

Proportion= 0,326 (32.6% dropout prevalence)

Confidence Interval ± 2.5%

Formula:

$$n = \{1.96^2 * p(1-p)\}/CI^2$$

$$n = \{1.96^2 * 0.326(1-0.326\}/0.025^2$$

$$n = \frac{0.8441}{0.000625}$$

$$n = 1350\ leraners$$

The derived sample size was distributed proportionally to the learner enrolment within the NSFP schools. This primarily ensured representation across all the schools.

Table 4-2: Estimated sample proportional distribution in NSFP schools in Nampula province

			SFP SCHOOLS		
Region	***Province***	***District***	***Schools***	***Current enrolment***	***Est. Sample for each school***
North	Nampula	Muecate	EPC Muecate	2875	456
		Moussoril	EPC Muaualo	586	93
		Ribauè	EPC Iapala Sede	2528	402
		Rapale	EPC De Niapala	2509	399
The total sample size required					**1350**

4.6 Sampling for the Qualitative data

Purposive sampling was applied to identify the key informants. Such sampling sought to select sections of the research population which in the researcher's judgment provided the most useful information for the study. The study targeted: the school principal, one relevant teacher for the NSFP at the school level, one cook, any 8-10 Parents who have children in the school receiving meals through the NSFP but not in Grade 6 and 7 and 8-10 farmers supplying food for the NSFP. The required key informants should have been knowledgeable about the NSFP and lived or worked in the district/community between 2013 and 2015.

Figure 4-2: A depiction of the sampling frame and sampling procedures

In total, the qualitative component was comprised of 12 key informants and 4 FGDs were held with Parents committee and 4 with Farmers). (see Figure 4.1 above).

4.7 Data collection procedures

4.7.1 Data collection procedures for quantitative measures

Quantitative data was obtained from both primary and secondary sources. Primary quantitative data was obtained through questionnaires from grade 6 and 7 learner in the NSFP schools. This was to collect data on demographic information, school infrastructure, perceptions and opinions about the national school feeding (See Appendix A3).

It is important to point out that certain information in the study such as overall enrolment, attendance and dropout number of children receiving school meals, etc., pertains to the whole NSFP schools. However, the specific target groups of learners individually interviewed for the quantitative component of the study were children in grades 6 and 7 in the NSFP schools only.

Additionally, data on school enrolment and dropout numbers were also obtained from records in the both selected schools (NSFP and Non-SFP schools) and the Provincial Directorate of Education records. Included in this was secondary data on learner's absence from school. This data was available for grade 3 learners only, because they were in the NSFP school from 2013-2015, Thus data on attendance was available for all 3 years, as they were enrolled in the schools for the first time in grade 1, in 2013, the beginning of the study period and were in grade 3 in 2015 when the study period ended).

4.7.2 Data collection procedures for qualitative measures

The researcher utilised key informant interviews, focus group discussions and observations. In choosing this strategy, the researcher considered not only its ability to explore, analyse and describe the subjective, but also its ability to describe the accurate experiences, intentions, perceptions, views, perspectives, and feelings of participants in their natural environment[77].

4.7.2.1 A Semi-structured interview

A semi-structured interview was held to collect data with selected key informants (school principals, teacher coordinating SFP, and cooks), see Appendixes (A1; A2; A4; and A5).

A **semi-structured interview** is a method of research used in the social sciences. It is flexible, allowing the new question to be brought up during the interview as a result of what the interviewee says. The interviewer in a semi-structured interview generally has a framework of themes to be explored. This type of interview, therefore, permits the interviewer to encourage an informant (respondent) to talk at length about the topic of interest[42]. The researcher chose this technique because he wanted to gain deeper insight from the perspective of the respondents about the implementation of SFP in the study area.

To encourage the participation and establish a confidential environment during the interviews, the lead researcher personally made appointments with all key informants selected. At the beginning of the interview, the interviewer presented the purpose of the study and obtained written consent for the interview. An interview guide was used to guide the interview and ended

with a summary of the main findings of the interview. If the informant agreed with the summary made, the interviewer thanked the interviewee for the information provided and for the time spent. If the interviewee did not agree with the summary, appropriate corrections were made. An efficient filing system was developed, which was kept under lock and key (with duplicate copies kept separately) to ensure the maintenance of a reliable audit trail[72].

4.7.2.2 Focus Group Discussions

A focus group discussion (FGD) is an informal technique that can help to assess the knowledge, beliefs, perceptions, and attitudes surrounding the phenomena under study[43]. In a focus group, you bring together from six to ten participants to discuss issues and concerns about the phenomena under study. The group typically lasts about two hours and is run by a moderator who maintains the group's focus[43].

Focus group discussions were conducted with eight separate groups of farmers (4 FGDs) and the school parent committee (4 FGDs). (See Appendixes A6 and A7). The FGDs with school parent committees and farmers consisted of general open questions on the SFPs which sought detailed depictions of how the SFP worked at the school level; how it was perceived within schools and communities and how it probably affected education, well-being as well as its sustainability within schools. The FGDs also explored parents' perceptions of the school feeding programme, its value and, the implementation of the programme, and their involvement in SF. Also, the FGDs with farmers also explored questions related to sources of products supplied to the school, the logistics and practical arrangements about supplying the products for the school meals, ability to meet demand, regularity of supplies and challenges of production and the value chain.

The interview guide employed the vocabulary (language) appropriate to the study site, in pursuit of conducting focus group discussions. These discussions were undertaken with the use of a voice recorder and interview guide. Before beginning the focus group discussions, the interviewer presented the purpose of the study and obtained written consent from the participants (see attached consent form Appendix B2), and also consent to use the voice recorder.

In this study, data had reached saturation by the time this number of key informants from each district had been interviewed, and there was, therefore, no need for additional interviews. Data

saturation implies that no more new categories emerge from the data: "When data are saturated, events do not remain as a single instance, they have been replicated at least in several cases, and with that replication lies verification[78]".

4.7.2.3 Key-informant interviews

i. **School principals**

School Principals are the key source of information regarding the management of school affairs including the NSFP. The interviews focused on information that the school principal had regarding managing the NSFP. As a custodian of the school and every programme within the school, the principal was expected to be able to give a detailed description of the day-to-day management of the NSFP. He was also expected to provide similar information about the method of procuring food for the SFP (where and how procured). (See Appendix A1 for the interview guide).

ii. **Relevant teachers**

These are the educators who are appointed to coordinate the NSFP at the school level, and their inputs regarding the implementation of the programme are vital. They were expected to give a detailed description of the NSFP, type and quantity of food served to learners, other complimentary interventions that were provided along with school feeding. They were also asked to express their perceived success of the programme in addressing hunger, and its contribution to improving education (regarding enrolment, attendance, and dropout) as well as information on where and how food is procured, regularity of supplies, transportation logistics, etc. The interviews included questions on challenges faced and suggested recommendations. (See Appendix A2 for the interview guide).

iii. **Cooks**

Cooks are the people responsible for preparing and serving food to learners and as such have important input to make on the operations of the programme. Also, cooks are parents who come from the local community and were expected to provide key information regarding the community perspective. The Interviews focused on how they have been selected, what meals were prepared, the menu if any, how the food was stored, prepared and served to the learners. The interview also probed about their remuneration if any, food quality audits, meal portions,

quality and timeliness of food supplied, and on the challenges faced. The tool was administered in the local dialect Macua (See Appendix A4 for the interview guide).

iv. Focus group with School Council/parents committee

School Council/parents committee is an integral part of the management of the NSFP in their respective communities. They are an important source of information both as a parent and as members of the body that manages the affairs of the school including the programme. The interview explored parents' perceptions of the school feeding programme, its value and, the implementation of the programme, and their involvement in SF. Interviews were conducted in the local dialect Macua. (See Appendix A7 for the interview guide).

v. Focus group with farmers

Questions for farmers were related to their capacity in producing enough food to supply to the school and on the logistics and practical arrangements about supplying the products for the school meals, ability to meet demand, regularity of supplies and challenges of production and in the value chain. They were also probed about the way they have been contracted and what they are expected to provide, as well as indicate what support if any, is provided to build the capacity of the farmers. Interviews were conducted in the local dialect Macua. (See Appendix A6 for the interview guide).

4.8 Data analysis

4.8.1 Quantitative Data analysis

The data collected through the quantitative methods were tabulated and statistically analysed with the assistance of a qualified statistician from the School of Health Systems and Public Health of the University of Pretoria.

Data were exported to STATA 14 and SPSS 21 packages. Enrolment and retention data was calculated for 2013, 2014 and 2015. Enrolment and retention in the different grades in schools with SFPs and schools without SFPs (non-SFPs) were compared using Chi-square tests.

Logistic univariate and multivariate regression models were fitted to predict the likelihood of enrolment and retention of learners in 2013, 2014 ad 2015 in SFP and non-SFP schools. Results were significant if $p<0.05$. Similarly, attendance data were retrospectively analysed using

descriptive statistics and the median, mode, and range provided as summary measures for the skewed distribution and presented in box plots.

Hypothesis tests were used to determine if there was a statistically significant difference in the attendance measures (number of days missed at school) and were analysed by the Mann-Whitney test.

4.8.2 Data analysis for qualitative component

Qualitative data were deductively analyzed using content analysis, whereby the lead researcher and the researcher assistants coded any manifest content in the focus group transcripts that related to each of the theme. Transcripts were coded separately, and then debriefing meetings were held until consensus was reached.

4.8.2.1 . Organising the data for analysis

Unique identifying codes were given to each school. The four SFP schools included in this study were assigned the following codes: S120; S130; S140; and S150 for schools. The farmers Focus Groups Discussions were given F200; F300; F400; and F500; and for School parents committee were assigned the following codes: C1000; C2000; C3000; and C4000. It is important to point out that the qualitative inquiry was only undertaken in the four schools chosen for implementing the national school feeding programme.

The information from both the semi-structured interviews and the focus group discussions were transcribed with the help of an expert. The transcripts produced became the text that was subjected to analysis. The transcription of the material emphasised readability and did not feature detailed intonations or pause lengths.

Such detailed level of transcription was not necessary given that the analytic focus was directed at the content of the discursive practices drawn from the respondents. The participants selected from the four schools for semi-structured interviews were given unique identifying codes reflecting their school codes, the sequence in which they were interviewed and their sex. For instance, a participant from school 200 who was the first participant to be interviewed and was male was assigned the code “200:1M”. A participant from school 400, who was the third participant to be interviewed and was female, was assigned the code: “200:3F”. (See Table 4.2 for the rest of the participant codes).

4.8.2.2 Content analysis

Content analysis usually refers to analysing text (interviews, transcripts, diaries or documents). In qualitative research it is used for data reduction, helping to make meaning out of the large volume of data and other material to identify core consistencies and meanings, patterns and themes[79]. All the above sources of data, now in the form of text, were subjected to a content analysis, but this was done separately for each data source.

The approach used for analysing qualitative data was similar to that suggested by (Creswell, 2009):

1. The data was organised and prepared for analysis. The researcher got 'Immersed' in the data by reading and re-reading different documents and transcripts, to familiarise itself with the data, as well as to identify important themes and categories. This action resulted in the emergence of new insights and gaining of a deeper and rich understanding of the phenomena under study.
2. Data was then coded according to the themes. Coding involved taking text data sentences or paragraphs into categories, and then labelling categories with the term, and often terms based on the actual language of the participant (Creswell, 2009).
3. A content analysis was then carried out to identify themes that emerged from the text.

4.8.2.3 Reporting qualitative findings

The qualitative findings of this study are presented in narrative form, and in some cases interspersed with quotations where necessary, to provide 'thick descriptions' of how school feeding programme was perceived for the respondents.

4.9 Validity and reliability, trustworthiness and credibility

4.9.1 Quality control

Data quality refers to the worth/accuracy of the information collected and focuses on ensuring that the process of data capturing, verifying and analysis is of high standard[80]). In this study issue of validity and reliability were addressed by embracing current constructs of quality assurance from a qualitative paradigm that include 'credibility,' 'transferability' and 'confirmability.'

4.9.2 The credibility of this inquiry (internal validity)

Credibility refers to establishing that the results of the study are credible or believable. Credibility in this inquiry was established trough rigour of techniques and methods and the credibility of the researcher.

Rigour of techniques and methods. To ensure rigour of techniques and methods, a full description of the research design, methods, and the fieldwork procedures and processes has been given in this chapter.

4.9.3 Transferability (external validity)

Transferability answer the question of how research findings can be applied to other contexts or other respondents. However, the intent of the research is not necessarily to generalise to a population, since the inquiry is context based and uses purposive sampling. McCoy, (2008) suggest that transferability can be achieved by providing 'thick description,' by collecting sufficiently detailed description of data in context, and by reporting the data with sufficient detail and precision. Thick descriptions may transport readers to the setting and give the discussion an element of shared experiences. By using purposive sampling, the range of information that can be collected about that context is maximised[80]. In this study, sufficient data was collected from two different sources already referred above. Semi-structured interviews and Focus Group Discussions were conducted until the data reached saturation. The recordings were then transcribed and analysed to give thick descriptions of the participants' narratives. Care was also taken to report on the findings in as great a level of details as possible, and with as much accuracy as possible to ensure transferability[80].

4.9.4 Dependability (Reliability)

Reliability revolves around repeated measures of the same phenomena and the more times findings of a study can be replicated, the more stable or reliable the phenomena is thought to be[79].

In this study, the researcher increased the reliability of the research, by interviewing all participants and by maintaining consistency in his approach by utilising the same interview structure and interview questions. The researcher again ensured that the data was reliable by operating systematically. The researcher also used the triangulation, which is the use of

multiple methods in data collection. This was carried out using two different methods of data collection.

4.9.5 Confirmability (objectivity)

Confirmability refers to the degree to which the findings are the product of the focus of the inquiry and not of the biases of the researcher. McCoy (2008) suggest that conformability can be best achieved if the researcher leaves an adequate audit trail to make it possible for the auditor to ascertain that the conclusions, interpretations, and recommendations can be traced to their sources and that the inquiry[80] support them. The audit trial should include: raw data; data reduction and analysis products; data synthesis and reconstruction products; process notes; material related to intention and dispositions; and instrument development information.

An audit trail describes in detail how data was collected, how categories were derived and how decisions were made throughout the inquiry. The researcher kept and maintained an audit trial by developing and maintaining an efficient filing system of all the raw data, analysis printouts, government documents and any other materials used for this study so that, should the need arise, these could be availed for examination to verify if the findings were consistent with the methods of data collection.

4.10 Meanings and definitions of variables

In this study, school participation refers to school enrolment, class attendance and learners drop out statuses. Thus, three different indicators have been formulated to measure the levels of enrolment, attendance, and drop-out. However, each of these terminologies has different meaning and derivation than other conventionally known indicators.

For instance, enrolment is the total number of pupils registered officially in a primary school. This was measured by checking on school enrolment records to establish the total number of registered children [9].

The attendance rate is the converse of absenteeism rate- this was measured by learner absentee days over the study period. In other words, absence rate measured the number of days a primary school child failed to attend class during the academic year fully[9]. Thus, the absence rates were the same as those recorded in the official school transcripts of the children that were given to them by the end of the academic year.

The drop-out rate is the rate of the number of children who dropped out of school during the academic year divided by those who were enrolled in school the same year.

Retention was defined as the number of pupils who stayed in school up to the end of an academic year[81]. In the context of this study, retention was measured by looking at school dropout rates before and after the introduction of the Mozambique NSFP.

A SFP is a versatile safety net that can be used as a platform to support children and their families in a variety of contexts, such as emergencies, economic shocks and, finally, linking to local purchases and increasing the income of small-scale farmers[13]

4.11 Pilot study

Pilot testing is a requirement for the accomplishment of research. A pilot study is a small scale preliminary study conducted before the main investigation to check for feasibility and improving the research toll[82]. A pilot study was conducted using school principals, teachers, learners, parents and farmers not included in the study groups.

Four sample schools for the pilot test were selected from the list of primary school in the southern part of Nampula province. Test-retest reliability was done to determine the reliability of the questionnaire[79].

The questionnaire was said to be reliable when the instrument produced the same results when administrated to the same participant under the same condition[79]. The questionnaire was administrated twice to different participants: school principals, teachers, learner, parents, and farmers not included in the study after that. Results obtained were compared. Appropriate changes were made based on both the pilot test and expert opinions. Same results obtained meant the questionnaire schedule were reliable.

4.12 Ethical consideration and Institutional approval

Given that the assessment involved learners at a primary school level, a number of ethical considerations were taken into account. The study received authorization from the Ministry of Education and Human Development of Mozambique (Appendix B4). The study received prior ethical approval from the Research Ethics Committee (REC) of the Faculty of Health Sciences, University of Pretoria, (Reference Nº 182/2016), (Appendix B3). After this, ethical approval was granted by the Ministry of Health National Ethics Committee (Ref: 270/CNBS/16), (Appendix B5).

For the semi-structured interviews and focus group discussions, the research participants were fully informed of the following in the participant information leaflet (Appendix B3):

- aims, methods, anticipated benefits and potential hazards of the research;
- their right to abstain from participation in the research and to terminate the interview at any time during the interview; and
- the confidential nature of their communications.

To protect the identity of the research participants, confidentiality and anonymity were assured, whereby identifying information would not be made available to anyone who was not directly involved in the study. In any report emanating from this study, the schools and individual participants would therefore not be identified.

4.13 Summary

In this chapter, an exposition of the research methodology used in the study was given, indicating the main research method, design, and strategies that were used to guide the study.

The criteria used for selecting the study sites and participants were elucidated, after which the way in which the data was collected and analysed was explained in detail. The credibility, dependability, transferability and confirmability concerns of the study have also been addressed. Finally, the limitations of the study and ethical considerations were highlighted.

Table 4-3: A biographic profile of research participants

Code	Formal Code	Sex	Education	Formal Activity
120: 1	S120: 1P	M	Degree in History	School principal
120:2	S120:2T	M	Degree in Portuguese teaching	SFP teacher coordinator
120:3	S120:3C	F	Grade 6	Cook
130: 1	S130: 1P	F	Bachelor of Portuguese	School principal
130: 2	S130: 2T	M	Bachelor Psychology	SFP teacher coordinator
130: 3	S130: 3C	F	None	Cook
140: 1	S140: 1P	M	Degree in Portuguese	School principal
140: 2	S140: 2T	M	Degree in Chemistry Teaching	SFP teacher coordinator
140: 3	S140: 3C	F	Grade 7	Cook
150: 1	S150: 1P	F	Degree in Geography	School principal
150: 2	S150: 2T	M	Bachelor Pedagogy	SFP teacher coordinator
150: 3	S150: 3C	F	None	Cook
1500: 1	P1500: 1C	M	MPH	SFP Provincial coordinator
1600: 2	D1600: 2C	F	Bachelor of Medic	SFP District coordinator
100:1	F100:1	M	Grade 5	Farmer Member
100:2	F100:2	M	None	Head of the farmers' association
100: 3	F100: 3	F	Grade 6	Treasurer
100: 4	F100: 4	F	None	Farmer Member
100: 5	FF100: 5	F	Grade 4	Farmer Member
100: 6	F100: 6	M	Grade 7	Farmer Member
100: 7	F100: 7	M	Grade 5	Farmer Member
100: 8	F100: 8	F	None	Farmer Member
200: 1	F200: 1	M	Grade 5	Farmer Member
200: 2	F200: 2	M	None	Treasurer
200: 3	F200: 3	F	Grade 6	Farmer Member

200: 4	F200: 4	M	None	Farmer Member
200: 5	F200: 5	M	Grade 4	Farmer Member
200: 6	F200: 6	F	Grade 7	Farmer Member
200: 7	F200: 7	F	Grade 5	Head of the farmers' association
200: 8	F200: 8	F	None	Farmer Member
300: 1	F300: 1	F	Grade 5	Farmer Member
300: 2	F300: 2	M	None	Farmer Member
300: 3	F300: 3	F	Grade 6	Treasurer
300: 4	F300: 4	F	None	Farmer Member
300: 5	F300: 5	F	Grade 4	Farmer Member
300: 6	F300: 6	M	Grade 7	Farmer Member
300: 7	F300: 7	M	Grade 5	Farmer Member
300: 8	F300: 8	F	None	Head of the farmers' association
400: 1	F400: 1	M	Grade 5	Farmer Member
400: 2	F400: 2	M	None	Head of the farmers' association
400: 3	F400: 3	F	Grade 6	Treasurer
400: 4	F400: 4	F	None	Farmer Member
400: 5	F400: 5	F	Grade 4	Farmer Member
400: 6	F400: 6	M	None	Farmer Member
400: 7	F400: 7	M	Grade 5	Farmer Member
400: 8	F400: 8	F	None	Farmer Member
1000: 1	Pc1000: 1	F	Grade 8	Member of the parents' committee
1000: 2	Pc1000: 2	F	None	Head of the committee
1000: 3	Pc1000: 3	F	Grade 7	Member of the parents' committee
1000: 3	Pc1000: 3	M	Grade 5	Member
1000: 4	Pc1000: 4	M	Grade 8	Member
1000: 5	Pc1000: 5	M	None	Member

1000: 6	Pc1000: 6	F	None	Member
1000: 7	Pc1000: 7	M	None	Member
1000: 8	Pc1000: 8	F	None	Member
2000: 1	Pc2000: 1	M	None	Member
2000: 2	Pc2000: 2	M	Grade 5	Member
2000: 3	Pc2000: 3	F	Grade 7	Member
2000: 4	Pc2000: 4	F	Grade 8	Head of the committee
2000: 5	Pc2000: 5	M	Grade 4	Member
2000: 6	Pc2000: 6	M	None	Member
2000: 7	Pc2000: 7	F	None	Member
2000: 8	Pc2000: 8	F	Grade 5	Member
3000: 1	Pc3000: 1	M	None	Member
3000: 2	Pc3000: 2	M	Grade 5	Member
3000: 3	Pc3000: 3	M	None	member
3000: 4	Pc3000: 4	F	None	Member
3000: 5	Pc3000: 5	M	Grade 6	Head of the committee
3000: 6	Pc3000: 6	F	Grade 5	Member
3000: 7	Pc3000: 7	F	Grade 4	Member
3000: 8	Pc3000: 8	M	None	Member
4000: 1	Pc4000: 1	F	Grade 5	Member
4000: 2	Pc4000: 2	M	Grade 4	Head of the committee
4000: 3	Pc4000: 3	M	None	Member
4000: 4	Pc4000: 4	F	Grade 5	Member
4000: 5	Pc4000: 5	F	None	Member
4000: 6	Pc4000: 6	F	None	Member
4000: 7	4000: 7	M	Grade 4	Member
4000: 8	C4000: 8M	F	None	Member

CHAPTER FIVE

5 Results, Findings, and Discussion

This chapter presents the results of data analysis of both quantitative and qualitative data obtained and the discussion of the findings.

The first section presents information on demographic characteristics of respondents and some general description of schools and school infrastructure. The second section presents results of the Mozambique NSFP and enrolment of learners. The third section deals with the result of the Mozambique NSFP and attendance of learners. The fourth section presents results of the Mozambique NSFP and retention of learners. The fifth section presents the results of descriptive analysis on the relationship between NSFP and local agricultural production.

5.1 **Response rate and sample distribution in NSFP schools**

The study had targeted an estimated 1350 learners to be interviewed in NSFP schools, however only 1216 responses were included in the final analysis, representing 90% overall response rate. EPC De Muecate Sede and Muaualo schools reported 76.5% and 64.3% response rates respectively. Table 5.1 shows the various response rates for the various NSFP schools in Nampula province.

Target Population = Total learner enrolment per school

$$\text{Estimated Sample Size} = \frac{\text{target population per school}}{\text{total population}} * \text{Total Est. sample}$$

$$Response\ Rate = \frac{Actual\ sample}{Estimated\ Sample} * 100$$

Table 5-1: Response rate and sample distribution in NSFP schools

	Target Population (%)	Estimated Sample (%)	Actual Sample (%)	Response Rate (%)
EPC De Muecate- Sede	2875(33.8)	456(33,8)	349(28.7)	76,5
EPC Iapala Sede	2528(29.7)	402(29,7	405(33.3)	100,8
EPC Niapala	2509(29.5)	399(29.5)	402(33.1)	100,8
Muaualo	586(6.9)	93(6.9)	60(4.9)	64.3

Total	1350	1216	90.0

5.2 Demographic characteristics of respondents in NSFP schools in Nampula

The demographics of respondents are important to the understanding of this study. The number of key informants in each category is shown in Table 5.2 below.

Table 5-2: Gender compositions of key informants sampled for qualitative inquiry in Nampula province NSFP schools (N=144).

Respondents	Male	Percent (%)	Female	Percent (%)
School Principals	3	(75)	1	(25)
Teachers	1	(25)	3	(75)
Parents Committee	24	(50)	24	(50)
Farmers	20	(42)	28	(58)
Cooks	-	-	32	(100)
NSFP Coordinators	8	(100)	-	-
Total	**56**	**(39)**	**88**	**(61)**

The study had a fair representation of both males and females. A total of one hundred forty-four key informants participated in this study. The proportion of males to females interviewed was 39: 61. However, among the individual categories of respondents, there were wide differences in the proportion of males to females. For example, all the NSF coordinators were male, and 75% percent of the school principals were male. All cooks interviewed were female.

5.3 Age and gender distribution of the sampled learners in schools with NSFP

The study findings revealed that of the 1216 learner responses received in the NSFP schools, over half of them (52.9%) were in the age bracket of 13 to 15 years while (31.3%) were aged between 10 to 12 years, (14.9%) between 16 to 18 years and (12%) above 19 years of age. The proportion of male to female learners interviewed was 57: 43. These findings, mean that most of the pupils who responded were aged more than 13 years, as shown in Table 5-3.

Table 5-3: Age and gender distribution of grade 6 and 7 leaners sampled in the 4 NSFP intervention schools in Nampula province (N=1216).

Variable	Group	Frequency	Percent (%)
Age Group	10-12 years	380	31.3
	13-15 years	643	52.9
	16-18 years	181	14.9
	>=19 years	12	1.0
Gender	Male	693	57.0
	Female	523	43.0

5.4 Description of intervention schools and school infrastructure

The selected schools for the study had almost similar characteristics. However, the NSFP schools had better infrastructure than the non-NSFP. For instance, non-NSFP schools did not have adequate physical infrastructure such as tables and chairs for use by learners.

All schools were in areas prone to natural disaster, which makes them vulnerable to food insecurity. The study area has poor road infrastructure and many roads around the schools were in poor condition. The schools also lacked basic facilities like fences, tap water, and playgrounds. No schools in the study area had electric power supply.

5.4.1 Availability and source of water in NSFP schools in Nampula Province

The learners were asked to indicate whether their schools had available water and the type of water source. The results of the study are given in Table 5-4.

Table 5-4: Availability of water and source of water responses from grade 6 and 7 learners in 4 NSFP intervention schools(N=1216).

		Frequency	Percent
source of water	Well Water	1122	92.3
	No response	94	7.7
Total		1216	100.0

Most of the learners (92.3%), reported available water at their school and the source of water was wells. The result can be interpreted to mean that not all schools had available water for the learners. These findings were confirmed during the field study that showed that in some places, because of where the schools are located, drinking water had to be fetched from as far as 4-6 kilometres and beyond.

5.4.2 Availability and number of functional toilet facilities

Among the sampled grade 6 and 7 learners (97.6%) responded that there was a functional toilet for both girls and boys, while (2.4%) responded that the school had no functional toilet facilities for boys/ girls. The type of toilet facilities in all cases was a simple pit latrine. Based on these findings, we may infer that the schools had functional toilets for both boys and girls, although, it was a simple pit latrine.

Table 5-5 shows the percentage of responses from the learners regarding the availability of functional toilet for boys and girls in their schools.

Table 5-5: Availability & number of functional toilet facilities in NSFP schools in Nampula province.

		Frequency	Percent (%)
Functional Toilet facilities	Yes	1187	97.6
	No	29	2.4
	Total	1216	100.0
Number of Toilets for girls	1 Toilet	388	31.9
	2 Toilets	456	37.5
	3 Toilets	304	25.0
	4 Toilets	11	.9
	Total	1 159	95.3
Not answered or missing		57	4.7
Total		1216	100.0
Number of Toilet for boys	1 Toilet	413	34.0
	2 Toilets	443	36.4
	3 Toilets	260	21.4
	4 Toilets	5	.4
	Total	1121	92.2
Not answered or missing		95	7.8
Total		1216	100.0

5.4.3 Availability of dining facilities and serving arrangement for learners.

The study also intended to find out if NSFP schools had dining halls for meals. From Table 5-6 (43.9%) responded that they were served their meals in the classroom, kitchen (27.4%), eating area (24.3%) and few (4.4%) reported that they were served meals in other places.

Table 5-6: Availability of dining facilities for learners in NSFP schools Nampula province

Meal Serving Area	Frequency	Percent (%)
Kitchen	333	27.4
Classroom	534	43.9
Eating Area	296	24.3
Other	53	4.4
Total	1216	100.0

All NSFP schools had no specific place for learners' meals. They sat anywhere around the school compound during eating. They had their meals outside the schools' buildings. The findings were further supplemented with qualitative evidence. A teacher coordinating NSFP at school S120 had this to say about school dining facilities:

"*My brother, we do not have a specific place for our learners to take the meals. Because the school does not have money to construct a meals hall for the learners. Unfortunately, learners will continue taking the meal in inappropriate conditions.*" (S120: 2T).

5.4.4 Availability of storage and food preparation infrastructure

The focus of this question was to find out from key informants about the storage of school food and cooking facilities. According to the responses, it was revealed that most school's storage rooms are not properly sealed to keep rodents and other small animals from gaining access to the food except in one school (S140). Kitchens used for cooking the meal is also another issue that needs attention as most school kitchens are not well constructed and furnished. Of the four schools, only one had a proper kitchen where cooking was done under safe conditions. The participants reported that it was built by the community around the school, using local material.

Furthermore, none of the schools had electricity. The lack of electric power supply required that the food was prepared from dry, non-perishable ingredients that kept for a long time and also did not need more complex preparations.

5.4.5 Meal preparation arrangements

The aim of the question was to find out from the cooks' perspective how they prepared meals for learners. According to the cooks interviewed in the study area, meal preparation and serving arrangements were done at the school compound. Food was cooked in large pots on open fires at the school every day. In all four schools, participating cooks reported that firewood was the fuel used to feed the stoves for cooking. They said that children were requested to bring a small stick of firewood to school on a daily basis. Participating cooks at each school complained that because of the use of firewood to prepare the meal, they sometimes coughed and, or were burned by the fire during meal preparation.

Two cooks interviewed made this remark

"We would like to get a medical care card to be assisted in the health center, free of charge or that the doctor should come to school for a regular check-up" (S120:3C and S130:3C).

5.4.6 The school meal-composition and frequency of meal

Table 5-7 reports responses given by learners regarding school meal-composition and frequency of meal provided in the school. The learners were asked to indicate the main type of meal offered in their schools by ticking one of the available options.

Table 5-7: The school meal-composition and frequency of meal in 4 NSFP intervention schools in Nampula Province

		Frequency	Percent (%)
Xima and dry beans	Yes	1149	94.5
	No	67	5.5
Xima with beans	Yes	1122	92.3
	No	94	7.7
Vegetable rice with pumpkins	Yes	1131	93.0
	No	85	7.0
Xima with vegetable	Yes	200	16.4
	No	1016	83.6
Vegetable rice with green beans	Yes	1132	93.1
	No	84	6.9

As shown on Table 5-7, most (94.5%) of learners reported that the school meal was comprised of Xima and dry beans, vegetable rice with green beans (93.1%), vegetable rice with pumpkins (93%), Xima with nourishing beans (92.3%), and Xima with vegetable (16.4%).

The above findings reveal that in all NSFP participating schools, Xima with dry beans sauce was the most common food, followed by vegetable rice (pumpkin and tomato) and Xima with vegetables, sauce and peanuts. The participants also reported being fed twice a day, with assorted meals every day of the week with at least 95% of the participants agreeing to the daily availability of food.

This information was reported by one of the four school principals who said: "*Learners in this school are served meal twice a day, from Monday to Friday only on school days. The school, therefore, do not feed over weekends and school holidays*" (S140:1T).

5.4.7 Learners perception of school meals

Table 5-8 shows that most (85.5%) of the respondents considered the food served at school to be of good quality while few 14.5% disagreed. Regarding the quantity, about 76.1% agreed that the food received satisfied their hunger while 23.9% were not pleased and wanted an increased ration.

Table 5-8: Learners' perception of school meals in NSFP in Nampula Province (N= 1216).

Description	Responses	Frequency	Percent (%)
Satisfaction with the Food Quality	Yes	1040	85.5
	No	176	14.5
Get enough to Satisfy Hunger	Yes	925	76.1
	No	291	23.9

The findings from the interview regarding the learner's satisfaction with the quality and quantity of school meals revealed that most of the learners were satisfied with the meals provided (85.5%) while 14.5% of them, were not satisfied with the quality of food received. They desired that the programme should be improved upon and continued because it supplements their food at home and is a source of hope for the extremely poor learners who depend solely on the NSFP. Overall, most of the respondents have a positive perception about the NSFP meals.

5.4.8 Parents' perception of the school meal

Focus groups were used to explore the perception that parents have towards of the quantity and quality of food provided to their children in the NSFP. To begin with, issues regarding the quality and quantity of meals prepared at school were examined. The main objective was to seek the opinions of parents and guardians regarding the quality and quantity of meals served to their children. This is important because how parents view the quality and quantity of meals prepared has the propensity to affect the scheme operation in the area. Concerning the parent's perception of the meals, responses from all four focus groups showed that participants saw the meals prepared for the learners to be of good quality and quantity. This implied that most of the respondents had a good opinion of the quality and quantity of the meals supplied by NSFP. There is, however, room for improvement as same parents were not entirely happy with the quality and quantity.

One parent participating in the FGDs made this remark: "*I think the meal offered to our children should be improved regarding quality. Sometimes my son comes home complaining of stomach*

pains, and I think it is due to the type of meal he takes at school. One day, in our cooking meal supervision routine, we realized that sometimes it was not cooked properly, especially when it comes to the bean. Therefore, we need to request the cooks to improve more the quality of meal P1000: 7C."

5.4.9 Time the meal was served

Table 5-9 shows the responses of the participants (learners) on the time that meals were served in their schools. Regarding meal times, 45% of the respondents reported to have their meals served every day in the morning (breakfast), while (43.9%) were served at mid-day (lunch) and about (11.1%) in the afternoon.

Table 5-9: Meal serving times in NSFP schools in Nampula Province

		Frequency	Percent (%)
Meal Serving Time	In the Morning	534	43.9
	Mid-Day	547	45.0
	In the Afternoon	135	11.1
	Total	1216	100.0

5.5 Mozambique NSFP relationship with enrolment of learners

In Chapter 2, one of the primary objectives of providing school meals to the learners was to increase school enrolment. The NSFP in the study area also contributed towards this objective, as was demonstrated by the study findings. The result of this study suggests that the NSFP played a role in increasing enrolment in primary schools of the study area.

5.5.1 Learners enrolment by grade in NSFP schools

Enrolment was examined by looking at two periods where learners were enrolled, that is before and after the implementation of the NSFP. Figure 5.1 shows the trend of learner enrolment, distributed by grade and year in schools implementing NSFP. The baseline information was obtained in 2013 while 2014, and 2015 provided the implementation years' data.

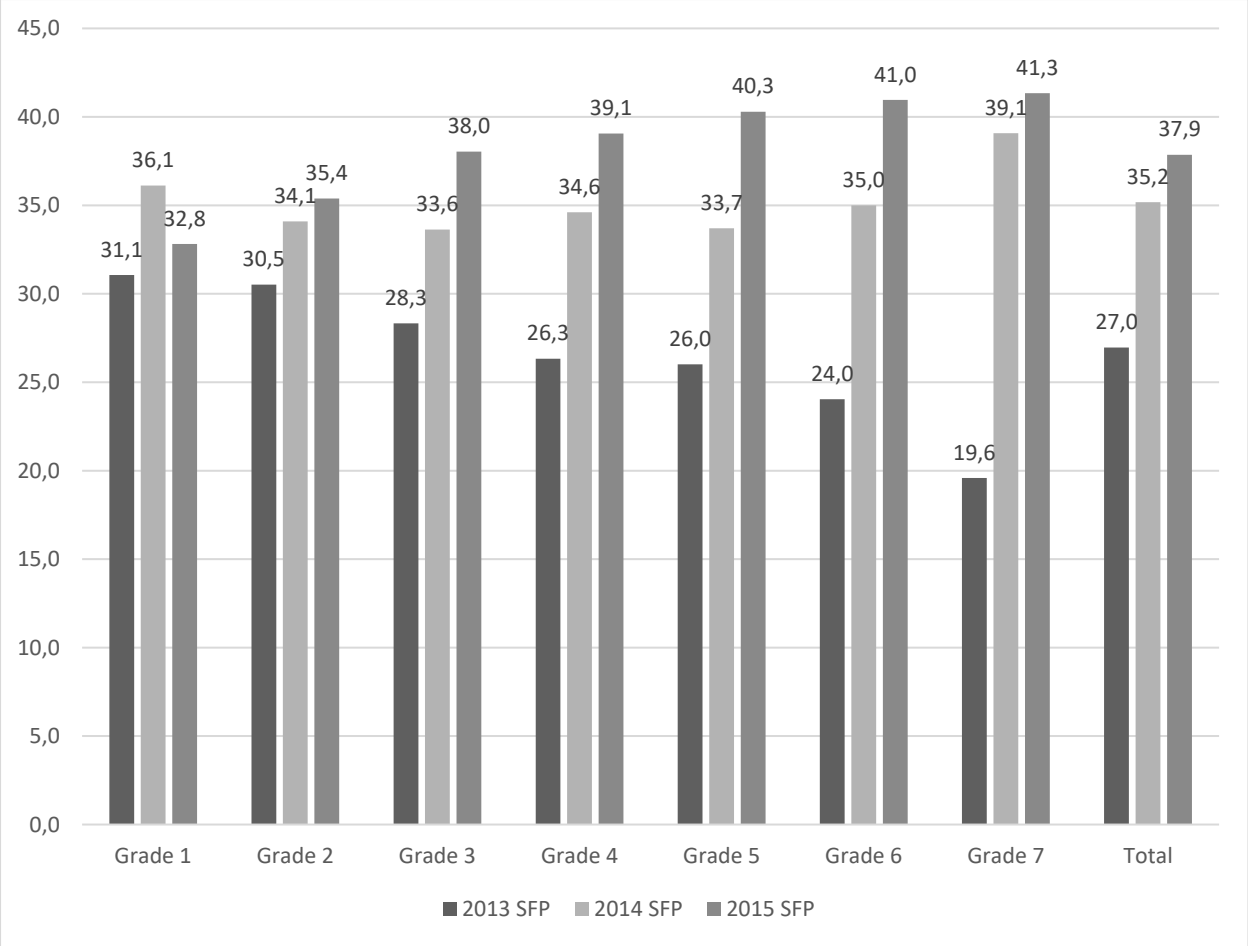

Figure 5-1: Enrolment across grade 1-7 from 2013-2015 in NSFP schools, measured as a percentage

In the baseline year 2013, before the introduction of NSFP, the upper grades (6 and 7) reported enrolments of (24.04% and 19.59%) respectively, which were the lowest enrolments compared to grade 1 (31.06%). However, the introduction of NSFP in 2014 and 2015, were marked by an increased percent of enrolment. For example, for grade 4 learners, the enrolment increased by 8.28% from 2013 to 2014 and by 4.45% from 2014 to 2015 academic year. (See also Table 5.23 in the Appendix D1).

5.5.2 Learners enrolment by grade in non-NSFP school

Figure 5.2 shows the trend of learner enrolment in the non-NSFP schools between the year 2013 until 2015.

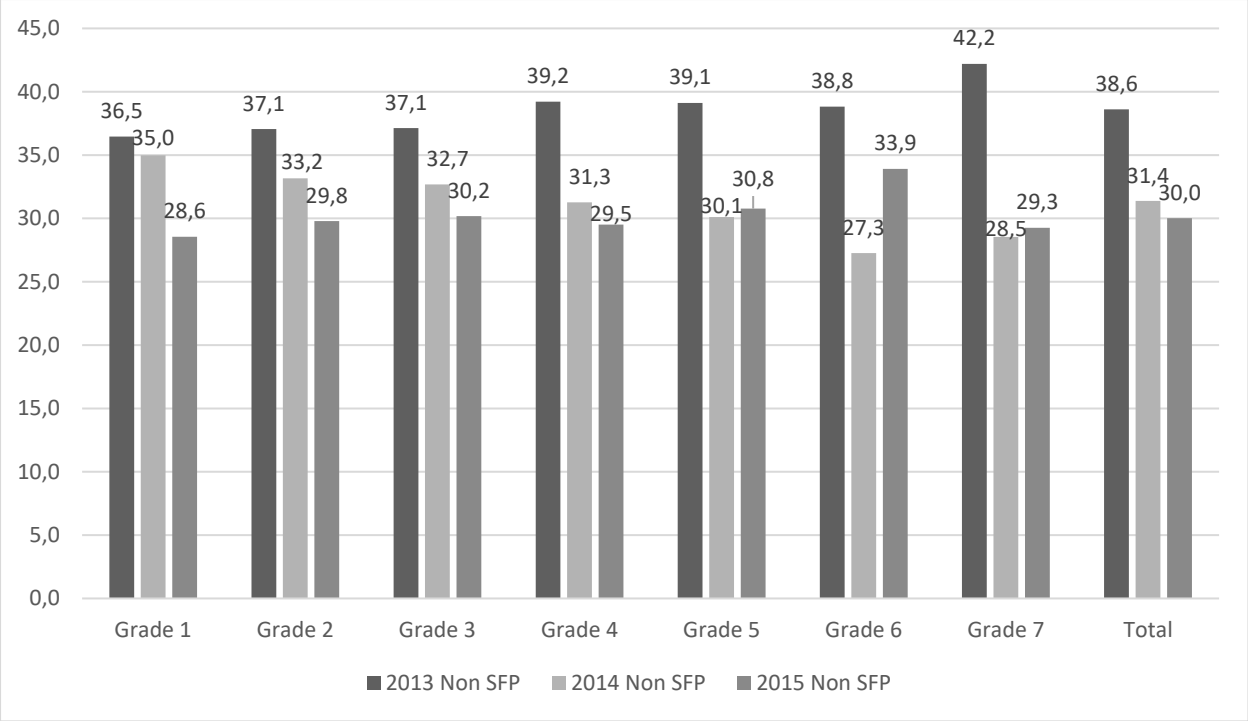

Figure 5-2: Trend of learner enrolment across grade 1-7 from 2013-2015 in non-NSFP schools measured as a percentage between 2013 and 2015.

The results indicate a notable overall decline in enrolment percentage for all grades reported in 2014 and 2015 selected years. For example, the enrolment percentage among grade 4 learners reduced by 7.95% between 2013 and 2014, grade 6 learners reduced by 11.57% in the same year. However, the decrease in enrolment between 2014 and 2015 across the grades was slightly lower than between 2013 and 2014. (See also Table 5.24 in the Appendix D1).

5.5.3 Learner Enrolment distribution by gender in NSFP schools

Table 5-10 shows results on gender disaggregated data for enrolment in NSFP schools.

Table 5-10: Enrolment distribution by gender in NSFP schools in Nampula Province between 2013 and 2015. (N=23 918)

Gender		2013	2014	2015	Total
Female	Frequency	2,880	3,929	4,254	11,063
	Percent (%)	26.03	35.51	38.45	100
Male	Frequency	3,343	4,475	5,037	12,855
	Percent (%)	26.01	34.81	39.18	100
Total		6,223	8,404	9,291	23,918
		26.02	35.14	38.85	100
		χ^2_{2df} = 33.4300		P=<0.001	

As shown, the NSFP has had an almost equal effect on the increase in male and female learners. For example, between the 2013/2014 and 2014/2015 academic years, girls' enrolment

proportion increased by about 9.48% and increased further by about 2.97% in the subsequent year. A similar increase was observed in the male learners (8.8% and 4.37%) respectively. A chi-square test result showed a statistically significant association between the year of enrolment and gender in schools with NSFP (χ^2= 34.43 P=<0.001).

5.5.4 Enrolment distribution by gender in schools non-NSFP schools

Table 5-11 shows results on gender disaggregated data for enrolment in non-NSFP schools

Table 5-11: Enrolment by gender in non-SPF schools in Nampula Province between 2013 and 2015(n=6 739)

Gender		2013	2014	2015	Total
Female	Frequency	1,003	724	625	2,352
	Percent (%)	42.64	30.78	26.57	100
Male	Frequency	1,576	1,412	1,399	4,387
	Percent (%)	35.92	32.19	31.89	100
Total	N	2,579	2,136	2,024	6,739
	%	38.27	31.7	30.03	100
			χ^2_{2df}= 1.6563 P = 0.437		

Between the 2013 and 2014 academic years, there was a notable reduction (about 11.86%) among girls while the male learners decreased slightly by (about 3.73%). Overall, more female learners dropped out of school between 2013 to 2015 academic years (16.07%) compared to (4.03%) for the male learners. However, the Chi square test showed there was no significant association between the year of enrolment and gender in non-NSFP schools.

Regarding gender, the results from the Chi square test revealed that enrolment by gender, between male and female learners, had a significant association for schools with NSFP (χ^2_{2df}= 34.43 P=<0.001) compared to schools without NSFP (χ^2_{2df} = 1.6563 P = 0.437) between 2013 to 2015.

5.5.5 Statistical inference for comparison on enrolment between NSFP and Non NSFP schools

5.5.5.1 Change in Enrolment between NSFP schools and non-NSFP schools in Nampula province from 2013 to 2015

School enrolment in NSFP had 30.5% enrolment increase between 2013 and 2014 whereas non NSFP schools noted an 18.7% decline. This resulted in a total enrolment increase of 15.51% in the sampled schools for this study. As shown in Fig 5.3 NSFP schools still reported a 7.63% increased enrolment whereas non NSFP enrolment declined by 4.33% in the second year of NSFP implementation between 2014 to 2015

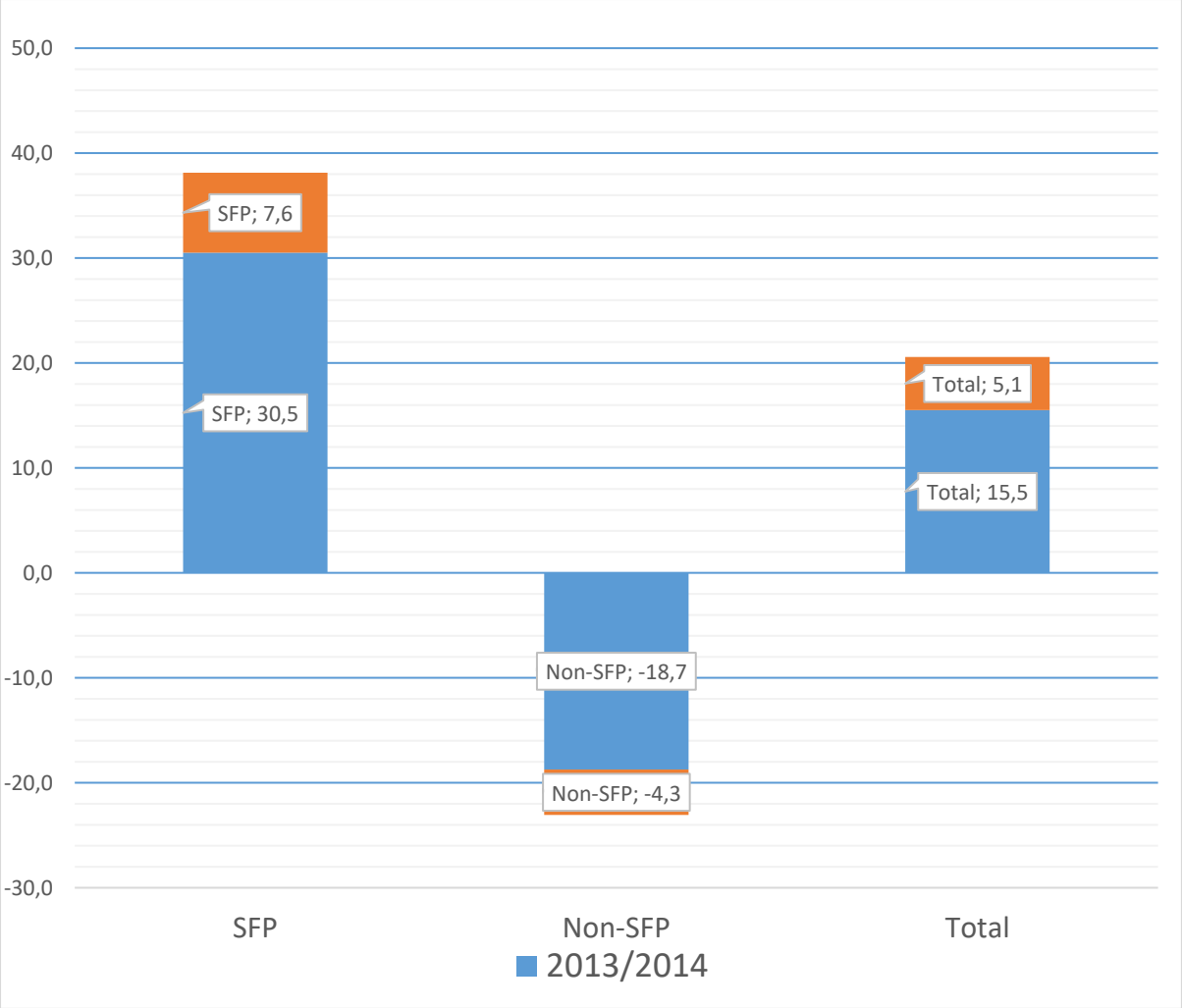

Figure 5-3: Change in Enrolment comparison between NSFP schools and non-NSFP schools in Nampula province from 2013 to 2015

5.5.5.2 Hypothesis results on retention of learners in NSFP and Non-NSFP schools

The chi square test was used for comparison of enrolment in NSFP and non-NSFP schools to determine if there was a statistically significant difference in the enrolment rates of learners between the two groups NSFP and non-NSFP schools. The results were as follows:

- **Hypothesis 1a: Grade enrolment between NSFP and non NSFP in 2013**

H_0; There was no difference between the enrolment in NSFP and non NSFP school records in 2013

Ha; There was a difference between the enrolment in NSFP, and non NSFP school records the year 2013

$\alpha =$ 0.05

Test = Chi Square

Rejection Criteria: p <.05

Test Statistic; $\chi^2_{6df} = 230.1298$ Pr = 0.000

Decision: Reject the null hypothesis

Conclusion: There was a statistically significant difference between learner's enrolment in NSFP and non NSFP school records in 2013

- **Hypothesis 1b: Grade enrolment between NSFP and Non NSFP in 2014**

H_0; There was no difference between the enrolment in NSFP and non NSFP school records in 2014

Ha; There was a difference between the enrolment in NSFP, and non NSFP school records the year 2014

$\alpha =$ 0.05

Test = Chi Square

Rejection Criteria: p <.05

Test Statistic; $\chi^2_{6df} = 35.4279$ Pr = 0.000

Decision: Reject the null hypothesis

Conclusion: There was a statistically significant difference between learner's enrolment in NSFP and non NSFP school records in 2014

- **Hypothesis 1c: Grade enrolment between NSFP and Non NSFP in 2015**

H_0; There was no difference between the enrolment in NSFP and non NSFP school records in 2015

Ha; There was the difference between the enrolment in NSFP, and non NSFP school records the year 2015

$\alpha =$ 0.0 Chi Square

Rejection Criteria: p <.05

Test Statistic; $\chi^2_{6df} = 32.7172$ Pr = 0.000

Decision: Reject the null hypothesis

Conclusion: There was a statistically significant difference between learner's enrolment in NSFP and non NSFP school records in 2015

Explanation:

It can be seen from the above findings that the null hypothesis was rejected for all three years, and thus there was a (P<0.001) significant difference between enrolment at NSFP and non-NSFP schools over the entire study period. The difference was positive, looking at Figure 5-1 and Figure 5-2 it can be seen that the enrolment was higher in the NSFP schools, even in 2013 at baseline before the implementation of NSFP.

Of note is the $\sum \chi^2$contribution changes shown above across the years 230.1298, 35.4279 and 32.71272 for the baseline year 2013 and pilot implementation years 2014 and 2015 respectively.

5.5.6 Univariate and multivariate modelling of enrolment

Table 5-12 shows the crude and adjusted ORs for enrolment between an intervention school and a comparison school. At baseline (2013), increase in a grade level had a lesser likelihood of being enrolled in an NSFP school compared to a non NSFP school; AOR 1.12 (p <.001). The enrolment was higher in grades1 to 3 compared to the grades 4 -7, as described in the earlier sections. However, after the introduction of the NSFP in 2014, the AOR reduced to 0.96 (<.001). This suggests that enrolling in an NSFP school was more likely with an increase in grade level. The AOR, in 2015, was not as significant as the changes across the grade enrolment during the second year of intervention was minimal.

There were a decreased odd of a learner being enrolled and dropping out in the NSFP schools, in 2013 AOR 0.56, (<.001). This could suggest that before the intervention, the NSFP schools did have fewer drop outs (better retention) than the non NSFP schools. After the introduction of the NSFP in 2014 and 2015, the likelihood of learners enrolled dropping out decreased, AOR 0.25(p <.001) and AOR 0.06 (p <.001).

Regarding gender, males were less likely to enrol in an NSFP school than females in 2013, AOR 1.27, (p <.001). This trend persisted after the introduction of the NSFP; with the AOR 1.88 (p <.001), AOR 1.87 (p <.001) for 2014 and 2015 respectively. This can be attributed to the increased female enrolment in NSFP schools during the intervention implementation years as shown in Table 5-10, with a decline in female learner enrolment in non NSFP schools as shown in Table 5-11.

Table 5-12: Combined logistic regression model for learner enrolment

Enrolment Model		**Univariate logistic Regression Model**						**Multivariate Logistic Regression Model**					
Variable & Description		**2013**		**2014**		**2015**		**2013**		**2014**		**2015**	
Intervention (0/1)		OR	pr.	OR	pr.	OR	pr.	OR	pr.	OR	pr.	OR	pr.
Status	Retained	-											
	Dropout	0.54	<.001	0.32	<.001	0.07	<.001	.56	<.001	.25	<.001	0.07	<.001
Grade	Grade 1												
	Grade 2	1.04	.651	1.00	.942	0.95	.706	1.12	<.001	0.96	<.001	1.0	.256
	Grade 3	1.10	.225	0.99	.902	0.90	.214						
	Grade 4	1.25	.006	0.92	.312	0.86	.074						
	Grade 5	1.29	.002	0.93	.409	0.89	.170						
	Grade 6	1.11	.198	0.65	<.001	0.77	.004						
	Grade 7	2.73	<.001	1.12	.140	1.21	.018						
Gender	Female												
	Male	1.25	<.001	1.71	<.001	1.74	.001	1.27	<.001	1.89	<.001	1.88	<.001

5.6 Mozambique NSFP and its relationship with retention of learners

In Chapter 3, it was discussed that the study area is prone to natural disasters and often faces various climate shocks. Like many other regions in the country, agriculture in this area is also rain fed, and households often face food shortages. Malnutrition is a public health concern; most children grow stunted and, in most cases, are vulnerable to diseases.[11] Consequently, such children are unable to attend school properly because of illnesses, most of which result from hunger and poor nutrition. Thus, one of the reasons behind the Mozambique Government launching the NSFP was to enable children to cope with the effect of hunger and get them to actively participate in school.

5.6.1 The trend of learner retention by grade in NSFP schools

Figure 5-4 shows the difference in retention rate trends of learners, by grade within the three different academic years, in NSFP schools. As can be observed, the retention of the learners of grade 1, was stable within the period under review (2013, 2014 and 2015) academic year. The retention rate of learners in grade one was 96.56%, 99.70% and 99.93% in 2013/14, 2014/15 and 2015/16 academic years respectively. The figures kept the same trend in grades two, three, four and five, within the same period. However, with the figure for grade six the level fell to 88.33% in the 2013/14 academic year and after that begun to increase again (98.72% and 98.75%). Surprisingly, the 2014/15 academic year retention rate in grade seven decreased by almost 10.14% (80.24%) after which it increased to 17.48% (97.72%) in 2015/16 academic year.

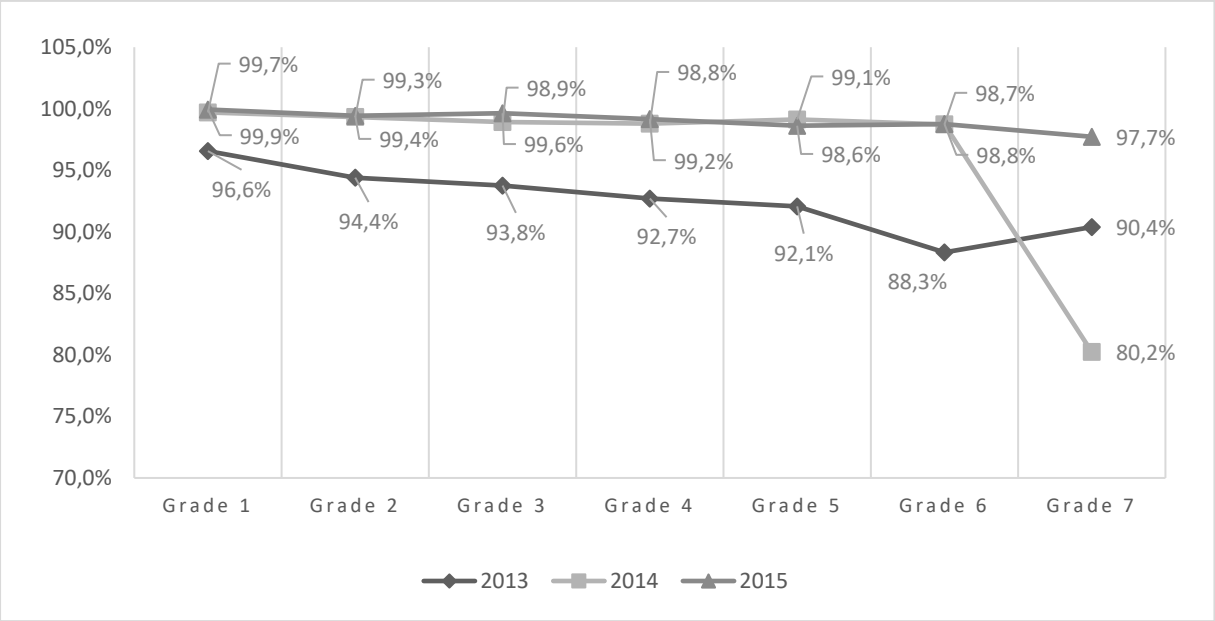

Figure 5-4: Trend of learner retention by grade in NSFP schools in Nampula Province

5.6.2 The trend of learner retention rate by grade in non-NSFP schools

As shown in Figure 5-5, there was a large school variation in the trend of learner's retention in different grades during the period under analysis. The retention rate in grade one and two had an upward trend between the 2013/14 and 2015 academic years. However, the rate dropped by almost 3.08% (86.49%) in 2013/14, for grade three learners while maintaining an upward trend in the 2014/15 and 2015/16 academic years. In the 2013/14 academic year, a large decrease was observed for grade six, where the retention rate had fallen considerably by almost 13.66 (77.05%) and after that slightly increased by 7.34 (84.39%) in the 2014/15 year and 0.32 (84.71%) in 2015/16 academic years. The trends kept increasing for the grade seven learners from 91.36% in 2013/14 to 90.23% 2014/15 and ending 90.22% in 2015/16.

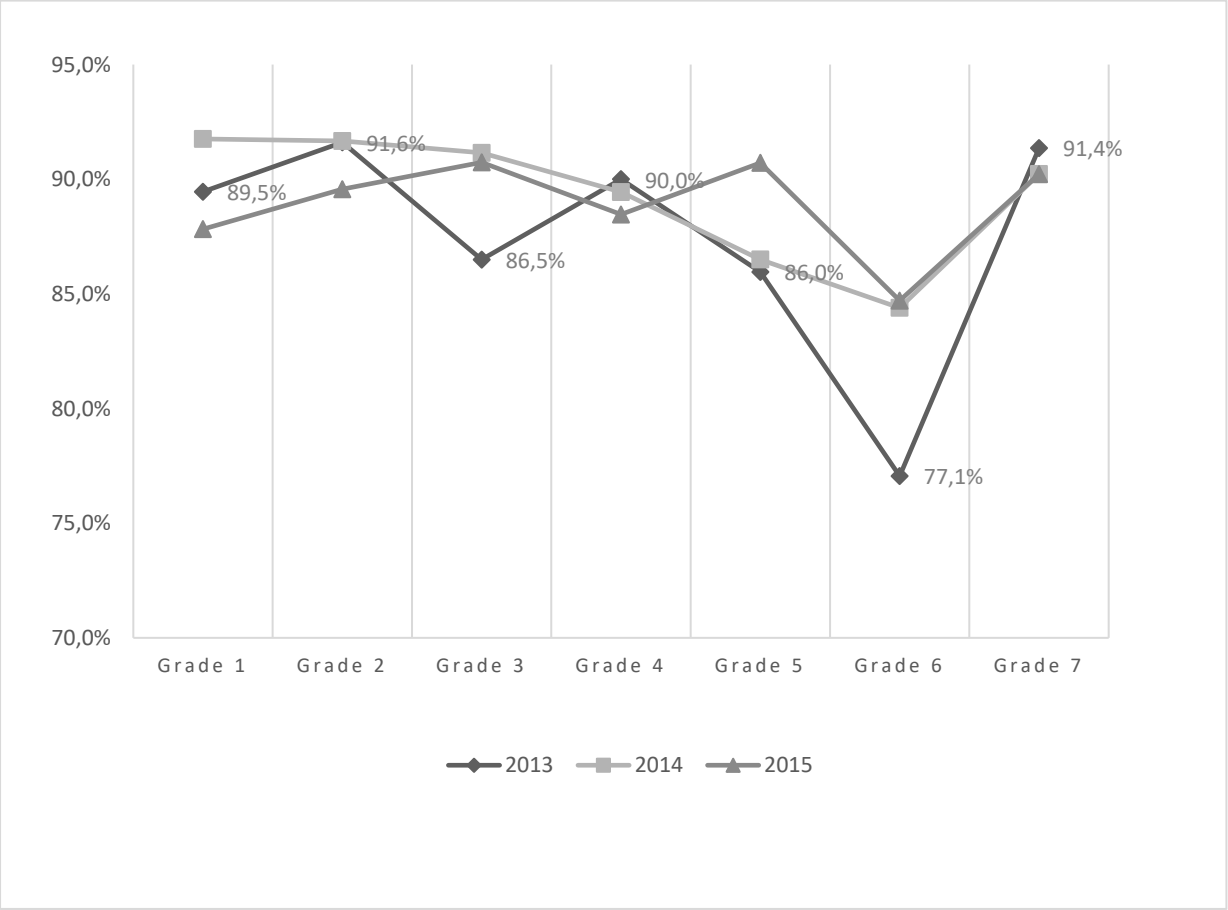

Figure 5-5: Retention trends in non-NSFP schools by grade and year in Nampula province in 2013, 2014 and 2015

The study findings (Figure 5-4 and Figure 5-5) revealed that aside from increased enrolment trends, NSFPs also had a positive influence on retention. In NSFPs schools, it was observed that many more children were still present at the end of 2014-2015 academic years compared to 2013, prior to the provision of school meals (Figure 5-4) and compared to retention in schools that did not provide school meals (Figure 5-5).

5.6.3 Learner retention rates distribution by gender in NSFP schools

Table 5-13 shows the gender distribution of learners in the school that provided meals.

Table 5-13: Learner retention rates distribution by gender in NSFP schools in Nampula Province

Gender		2013	2014	2015	Total
Female (n)	Frequency	2,880	3,929	4,254	11,063
	percent (%)	26.03	35.51	38.45	100
Male (n)	Frequency	3,343	4,475	5,037	12,855
	percent (%)	26.01	34.81	39.18	100
Total (n)	Frequency	6,223	8,404	9,291	23,918
	percent (%)	26.02	35.14	38.85	100
			χ^2_{2df} = 1.6563 Pr = 0.437		

There was an increase in the number of male learners retained (13.17%), while the retention of female learners also increased (12.42%) in the period 2013 to 2015. However, this result was not statistically significant (P <0.437).

5.6.4 Learner retention rates distribution by gender in non-NSFP schools

Table 5-14 shows the gender distribution of learners in schools that did not provide meals.

Table 5-14: Learner retention rates distribution by gender in non-NSFP schools

Gender		2013	2014	2015	Total
Female (n)	Frequency	1,003	724	625	2,352
	percent (%)	42.64	30.78	26.57	100
Male (n)	Frequency	1,576	1,412	1,399	4,387
	percent (%)	35.92	32.19	31.89	100
Total (n)	Frequency	2,579	2,136	2,024	6,739
	percent (%)	38.27	31.7	30.03	100
			χ^2_{2df} = 33.4300 Pr = 0.000		

There was a decrease in a number of female learners (4.03%), while the retention of male learners also decreased (16.07%) in 2013 to 2015 academic years. The retention rate among the female learners is much lower compared to the male learners. This result is statistically significant (P <0.001). In general, there is evidence that suggests a significant positive effect of the NSFP on learner retention because a positive association was observed in this study. Finally, the Chi-square test between the two groups of schools (NSFP and Non-NSFP) shows significant differences.

5.6.5 Statistical inference for comparison on retention between NSFP and Non NSFP schools

5.6.5.1 Change in Retention between NSFP schools and non-NSFP schools in Nampula province from 2013-14 and 2014-15

Learners retained at the end of the year as shown in Figure 5-6 increased by n=2181 (35%) between 2013 and 2014 in SFP schools. A further increase of n=887 (10.55%) was also noted between 2014 and 2015 in NSFP schools. Non NSFP schools, retention of learners dropped by (n=-443)17.18% between 2013 and 2014 and (n=-112) 5.24% between 2014 and 2015.

The year of intervention had a total retention increase of (n=1738) 19.75% in both NSFP and non NSFP compared to baseline year of 2013, while in the preceding year, retention increased by (n=7757) 35%. (see Table 5.26 and Table 5.27 attached in Appendix D1).

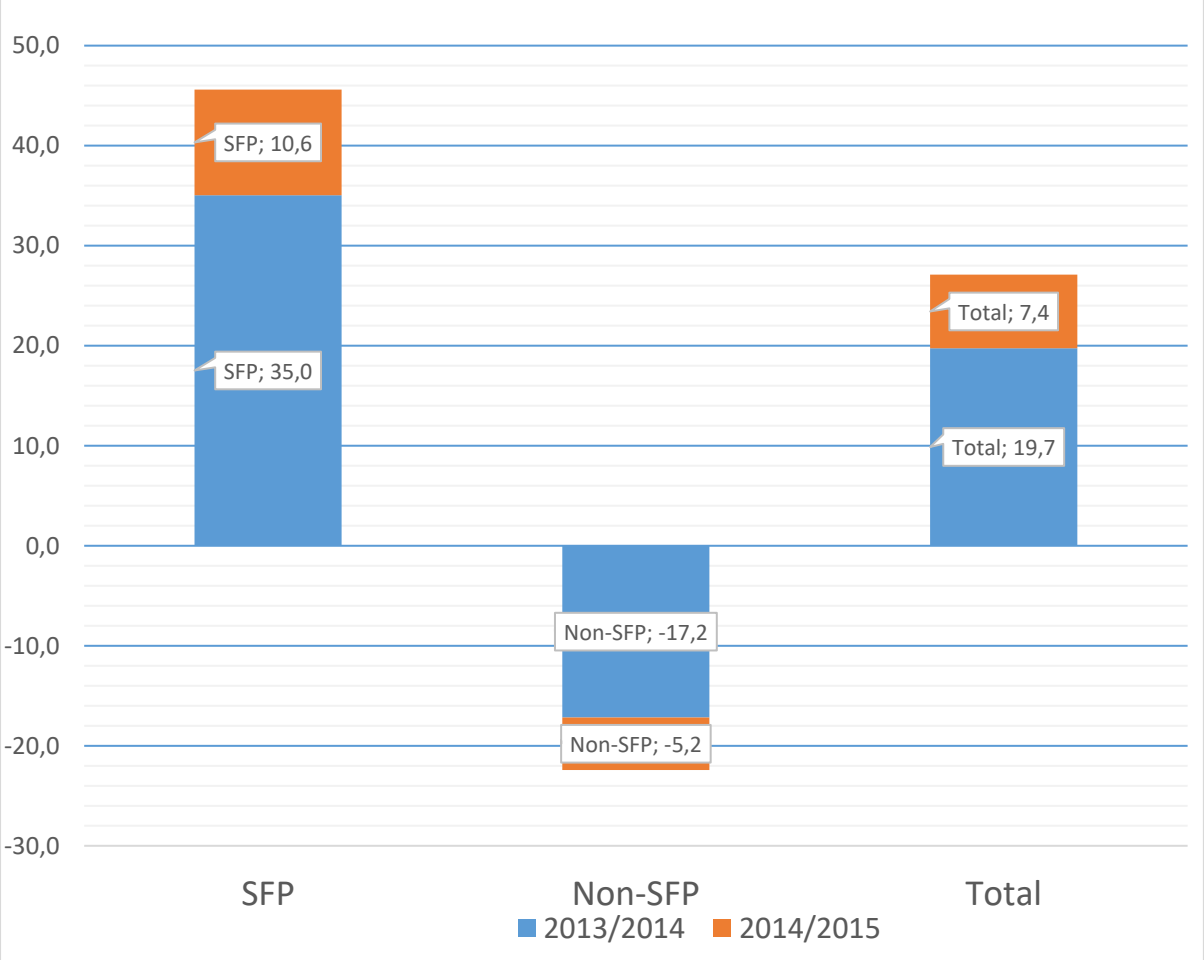

Figure 5-6: Retention change between NSFP schools and non-NSFP schools in Nampula province from 2013 to 2015

5.6.5.2 Hypothesis results on retention of learners in NSFP and Non-NSFP schools

The chi square test was used from comparison of retention in NSFP and non-NSFP schools to determine if there was statistically significant difference in the retention rates of learners between the two groups of schools. The results were as follows:

- **Hypothesis 2a: Count of retained learners between NSFP and Non NSFP in 2013**

H_0; There was no difference between count of retained learners in NSFP and Non NSFP school records in 2013
Ha; There was a difference between the retention days of NSFP and Non NSFP school records the year 2013
α = 0.05
Test = Chi Square
Rejection Criteria: p <.05
Test Statistic; χ^2_{6df}= 7.7302 Pr = 0.259
Decision: fail to reject the null hypothesis
Conclusion: There was no significant difference between the retention days of NSFP and non NSFP school records in 2013

- **Hypothesis 2b: count of retained learners between NSFP and Non NSFP in 2014**

H_0; There was no difference between the count of retained learners in NSFP and Non NSFP school records in 2014
Ha; There was a difference between the count of retained learners in NSFP, and Non NSFP school records the year 2014
α = 0.05
Test = Chi Square
Rejection Criteria: p <.05
Test Statistic; χ^2_{6df}= 222.2180 Pr = 0.000
Decision: Reject the null hypothesis
Conclusion: There was a statistically significant difference between the cothe unt of retained learners in NSFP and Non NSFP school records in 2014

- **Hypothesis 2c: Retention days between NSFP and Non NSFP in 2015**

H_0; There was no difference between the cothe unt of retained learners in NSFP and Non NSFP school records in 2015
Ha; There was a difference between the cothe unt of retained learners in NSFP, a, d Non NSFP school records the year 2015
α = 0.05
Test = Chi Square
Rejection Criteria: p <.05
Test Statistic; χ^2_{6df} = 32.6221 Pr = 0.000
Decision: Reject the null hypothesis
Conclusion: There was a statistically significant difference count of retained learners in NSFP and Non NSFP school records in 2015.

Explanation:

It can be seen from the above findings that the null hypothesis was not rejected for 2013. It was rejected for 2014 and 2015, and thus, there was a (P<0.001) significant difference between retention at NSFP and non-NSFP only in 2014 and 2015 after NSFP had been instituted. The difference was positive in 2014 and 2015

5.6.6 Univariate and multivariate regression modelling of retention

The retention model was fitted to explain the occurrence of either being retained or dropping out of school (Status 0/1) coded as a binary outcome; thus, the use of logistic regression modelling. The following parameters were considered during the modelling: Independent (outcome variable) – Status, coded as either Retained or Drop Out.

The dependent variables for the model were the Intervention (either NSFP or non NSFP), Grade (1-7) and Gender (male or female). The univariate model (Table 5-15), explaining the likelihood of retention, showed that in 2013 learners were more likely to be retained in NSFP schools than non-NSFP schools [OR 0.54 (p <.001)]. During the year of intervention (2014), the likelihood of learner retention further increased in NSFP schools [OR 0.32 (p <.001)]. The final year results in 2015 also showed increased protective trends with the highest likelihood of being retained occurring in NSFP schools [OR 0.07, (p <.001).

Investigating the likelihood of retention across the different grades, showed that grade 7 had the highest protective odds change between 2013 and 2014, [2013 OR 0.55 (p<.001); 2014 0.10(.<.001)]. The odds of retention, however, increased to [OR 0.62, (p.<.011)] in 2015. Considering gender, in 2013, males were less likely to be retained compared to female learners in NSFP schools, OR 1.73, (p<.001). The likelihood of males not being retained further increased in 2014 OR 2.93 (p <.001), then declined in 2015 OR 1.42 (p<.002).

A logistic multivariate regression model was fitted, to predict the likelihood of retention of learners in 2013, 2014 and 2015 in NSFP and non-NSFP schools; considering all the explanatory variables. (see Table 5-15). The adjusted odds ratio (AOR) for our main objective of determining the likelihood of retention between NSFP and non NSFP schools was: 2013; OR 0.56, (p <.001) 2014; OR 0.25, (p <.001) and 2015 OR 0.07 (p <.001). Figure 5-4 and Figure 5-5 did show that across all three years (2013/14/15 retention increased across the NSFP schools compared to non NSFP schools.

The adjusted odds ratio (AOR) for the grade 1-7, for 2013; AOR 0.88 (p <.001), 2014; AOR 0.64 (p <.001); 2015; AOR 0.91 (p.<001). The highest likelihood of retention across the grades was noted in the year of intervention. Thus, reinforcing the suggestion of a positive association between NSFP and retention in days by learners.

Male learners were less likely to be retained in NSFP schools than females in 2013 with an [AOR 1.83 (p <.001)]. The AOR increased further in 2014 during the intervention year [AOR 3.81 (p <.001)] and declined in 2015 [AOR 2.07 (p <.001)]. As shown in the Table 5-15.

Table 5-15: Combined logistic regression model for learner retention

Retention Model		**Univariate logistic Regression Model**						**Multivariate Logistic Regression Model**					
Variable & Description		**2013**		**2014**		**2015**		**2013**		**2014**		**2015**	
Status (0/1)		OR	pr.	OR	pr.	OR	pr.	OR	pr.	OR	pr.	OR	pr.
Intervention	Non NSFP	-											
	NSFP	.54	<.001	.32	<.001	.07	<.001	.56	<.001	.25	<.001	.07	<.001
Grade	Grade 1	---											
	Grade 2	.82	.175	.86	.508	1.0	.999	.88	<.001	.64	<.001	.91	<.001
	Grade 3	.62	<.001	.73	.154	1.25	.321						
	Grade 4	.63	<.001	.65	.042	0.91	.670						
	Grade 5	.51	<.001	0.58	.010	0.89	.581						
	Grade 6	.32	<.001	0.58	.010	0.70	.080						
	Grade 7	.55	<.001	.10	<.001	0.62	.011						
Gender	Female												
	Male	1.73	<.001	2.93	<.001	1.42	.002	1.83	<.001	3.81	<.001	2.07	<.001

5.7 Mozambique NSFP and its relationship with learner attendance

Grade 3 learner's attendance rates over the study period 2013, 2014 and 2015, were retrospectively reviewed using learner records from both NSFP and non NSFP schools.

Table 5-16: Comparison of absent days by learners in NSFP and non-NSFP schools from 2013 to 2015

Year		Obs	Median (95% CI)	Mode. (Freq, %)	Min	Max	mean	SD
2013	Combined	400	38 (36-44)	24 (32, 8%)	9	96	46.94	25.16
	NSFP	200	38 (34-44)	-	14	95	47.32	25.31
	Non NSFP	200	38(35-44)	-	9	96	46.56	25.06
2014	Combined	400	14 (14-16)	4 (107, 26.8%)	3	94	19.90	18.73
	NSFP	200	6 (6-7)	-	4	19	8.96	4.91
	Non NSFP	200	27(25-29)	-	3	94	30.85	20.94
2015	Combined	400	5(5-6)	6 (48, 12.0%)	2	94	17.51	19.52
	NSFP	200	4(4-5)	-	2	9	4.76	1.53
	Non NSFP	200	29(26-35)	-	2	94	30.26	20.85

Table 5-16 shows a comparison table for school attendance between 2013-2015 for grade 3 learners in NSFP and non-NSFP schools. Comparing the median between the NSFP and non NSFP schools for grade 3 learners, in 2013 (baseline), both schools had the same median, with a slightly different confidence interval, the upper bound of the ranges were almost similar (95 and 96), compared to the lower boundary which was 14 and 9. However, a different trend was seen in 2014 after the introduction of NSFP, where there was a significant difference in the median between the NSFP and non NSFP schools. This is made clearer when the range is considered. The number of days absent at school for NSFP school ranged from 4 to19 compared with 3 to 94 in non-SPF schools. This same trend can be seen in 2015, where the range for NSFP schools was 2 to 9 and 2 to 94 for non NSFP schools.

5.7.1 Attendance frequency by gender for grade 3 learners in NSFP and non-NSFP schools

Table 5-17 shows the frequency of gender of learners that missed schools in NSFP and non-NSFP school, from 2013 to 2014.

Table 5-17: Comparison table for a number of days missed by learners in NSFP and non SFP disaggregated by year and Gender

		Male			Female		
Year	Schools	Median	95% CI	Range	Median	95% CI	Range
2013	Non NSFP	44	36 – 49	15 - 96	34.5	29 – 38.5	9 - 96
	NSFP	36	34 – 44	14 - 94	38	34 – 52.4	15 – 95
2014	Non NSFP	25	24 – 29	3 – 94	28.5	25 – 34	4 – 94
	NSFP	7	6 – 8	4 – 19	6	6 – 8	4 – 19
2015	Non NSFP	28.5	25 – 34.1	2 – 94	29	25.48 – 35	2 – 94
	NSFP	4	4 – 5	2 – 9	4	4 – 5	3 – 9

Before the introduction of NSFP, both groups of schools NSFP and non NSFP appeared to have no difference in attendance for male and female learners. They had a similar upper boundary in absent days (96 and 95). Nevertheless, in 2014 and 2015, there was a difference in the median days absent compared to 2013. In 2014, the non-NSFP school's median for days absent decreased by 19 for males and by 6 days for females.

In 2015, these figures were 15.5 for males and 5.5 for females in non-NSFP. In 2014 for NSFP schools the absent days for males were reduced by 29 and for female by 32. In 2015, absent days were reduced further in the males by 3 and females by 2.

The difference in their ranges reflects the difference in days absent in the NSFP schools. NSFP reduced absent days, but there was a slight increase from 2014-2015 in the non NSFP schools.

5.7.2 Statistical inference for comparison on attendance between NSFP and Non NSFP schools

5.7.2.1 Days' Absent distribution plots for NSFP and non-NSFP schools' comparisons

The following box plots **Error! Reference source not found.** depict the differences in attendance (days absent) between the NSFP and non - NSFP schools.

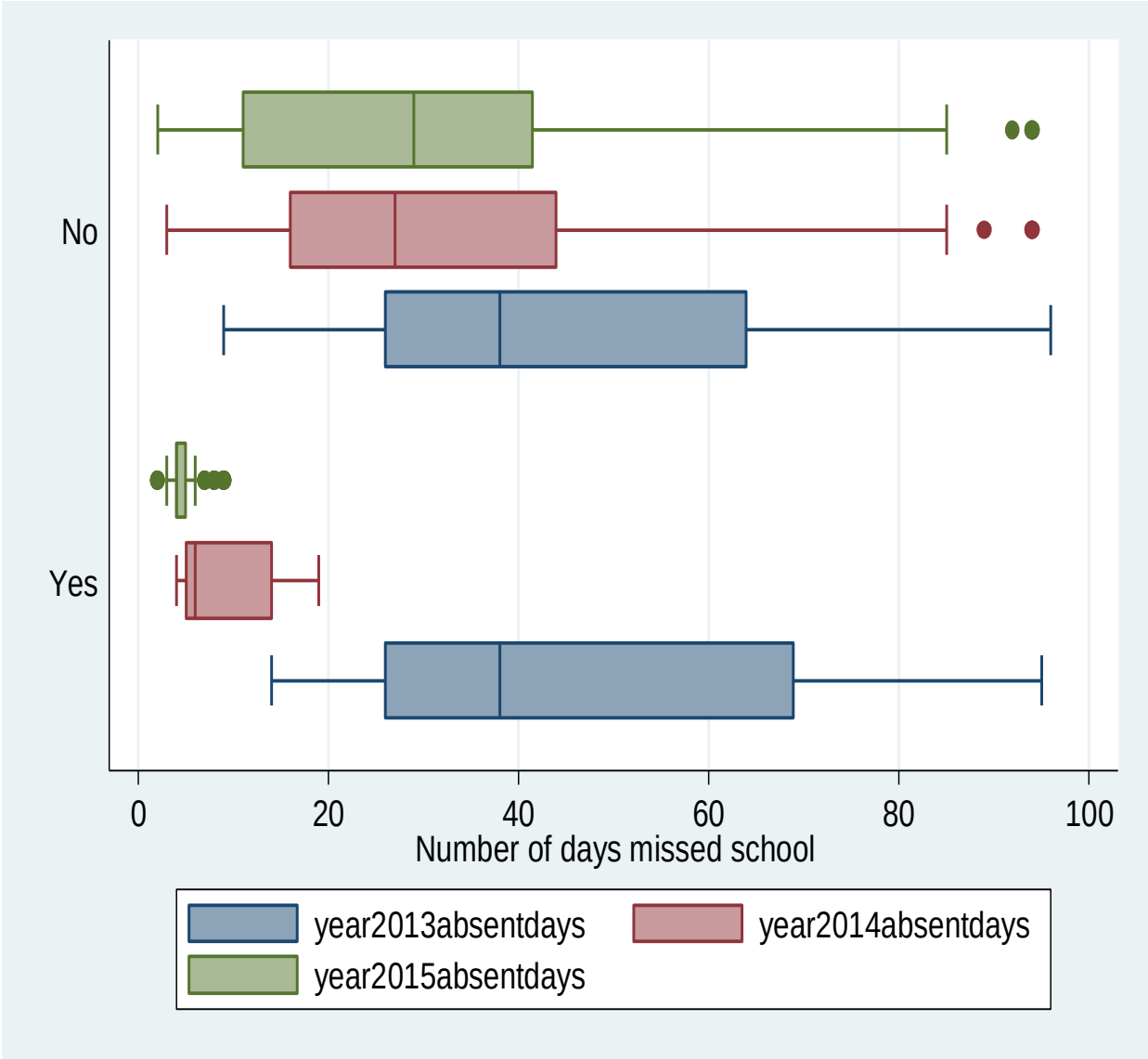

Figure 5-7: Box plots of days absent in NSFP and non - NSFP schools between 2013-2015

5.7.2.2 Hypothesis results on retention of learners in NSFP and Non-NSFP schools

Given that the data was skewed and not unimodal, the Mann-Whitney test which is a non-parametric test designed to compare the medians of two samples by ranking the values was used the sampled groups were also independent of each other. The comparison of medians between the NSFP and non-NSFP schools for 2013,02014 and 2015 are shown below:

- **Hypothesis 3a: attendance rates between NSFP and Non NSFP in 2013**

H_0; Median $_{NSFP}$ – Median $_{Non\text{-}NSFP}$ = 0 in the year 2013
Ha; Median $_{NSFP}$ – Median $_{Non\text{-}NSFP}$ ≠ 0 in the year 2013
α = 0.05
Test = MWW
Rejection Criteria: p <.05
Test Statistic; p= 0. 8879
Decision: fail to reject the null hypothesis
Conclusion: There was no statistically significant difference between the median number of absent days between the two groups, NSFP and Non NSFP in 2013.

- **Hypothesis 3b: attendance rates between NSFP and Non NSFP in 2014**

H_0; Median $_{NSFP}$ – Median $_{Non\text{-}NSFP}$ = 0 in the year 2014
Ha; Median $_{NSFP}$ – Median $_{Non\text{-}NSFP}$ ≠ 0 in the year 2014
α = 0.05
Test = MWW
Rejection Criteria: p <.05
Test Statistic; p= <0. 001
Decision: Reject the null hypothesis
Conclusion: There is a statistically significant difference between the median number of absent days between the two groups, NSFP and Non NSFP in 2014.

- **Comparison of attendance rates between NSFP and Non NSFP in 2015**

H_0; Median $_{NSFP}$ – Median $_{Non\text{-}NSFP}$ = 0 in the year 2015
Ha; Median $_{NSFP}$ – Median $_{Non\text{-}NSFP}$ ≠ 0 in the year 2015
α = 0.05
Test = MWW
Rejection Criteria: p <.05
Test Statistic; p= <0.001
Decision: Reject the null hypothesis
Conclusion: There is a statistically significant difference between the median number of absent days between the two groups, NSFP and Non NSFP in 2015.

Explanation

The results confirmed that there was no statistical significance between NSFP and non-NSFP schools regarding days absent in 2013 (p 0.8879). This is because neither group was being fed at school. Once the NSFP schools were feeding the learners in 2014 and 2015, there was a significant decrease in days absent from school in the schools where children were receiving food at school (p <.001) as shown by the hypothesis results.

5.8 The relationship between NSFP and local agricultural production

This section aimed to present qualitative findings using thematic content analysis on the capacity of local smallholder farmers to supply the NSFP in the study area.

One of the objectives of this study was to investigate whether the smallholders in Nampula province could in future supply food ingredients required by NSFP. A school survey questionnaire, key informant interviews, and document review were used as instruments to gather the data used in this analysis. Four primary schools were implementing the NSFP in the study area. All four schools responded to the survey questionnaire. The responses obtained were significant because this section can speak with confidence on what is happening about National School Feeding Programme across all schools in the study area.

According to Songa, the overarching objectives of the HGSFP is to act as a vehicle for promoting local development and fighting food and nutrition insecurity, disease and to stimulate agriculture production and development by linking small local producers to markets (schools)[83]. Within education, the purpose of HGSF is to increase enrolment, promote regular school attendance and retention; improve children's learning capacity, and learning outcomes, and enhance gender equality[83]. However, the HGSFP has a component for farmers and community stakeholders: improved food security, including food availability, access, and utilization[7,26,83]. In the opinion of Neeser (2012), the advantages of linking local agriculture and school feeding are substantial: more prosperous smallholder farmers, with a more secure future; stronger rural communities, with more stable economies; increased demand for local, fresh food; and healthier, happier children[84].

5.8.1 Theme 1: National school feeding implementation

Concerning the implementation of the NSFP, responses summarised from the four focus group discussions indicates that the participants were aware the programme and when it started in

their villages and that the programme was about feeding children in school. The farmers also knew that their district was the 1st district in the province enrolled in the programme. In all districts, the District authority came to introduce the programme under the condition that the community members would build a kitchen and store. After the construction, the districts received kitchen utensils and plates. The farmers indicated that it was not easy to access NSFP markets, due to bureaucracy and the huge number of documents needed.

One of the farmer's members in FGDs said: "

When we knew the commencement of the programme in our district and the business opportunity, we were very pleased. However, since the program started, we never managed to sell our products to schools in the quantities we produce because the requirements to be selected as a supplier are too many, F1000:2".

While another participant farmer in the FGD reiterated;

"We are happy the programme came to our district because we see the benefits of the programme to our children: the children do not eat lunch anymore in the home, the children get more nutritious food due to the variation in the school meals, and they are enthusiastic to go to school, F2000:3

5.8.2 Theme 2: The composition of the food basket for NSFP

Key informant interviews revealed that all NSFP schools were using a cooked menu based on recommended meal plans and approved national menus. It included seasonal agricultural produce such as vegetables. This directive was meant to enhance the nutritional content of the food for the schoolchildren. The composition of the school meal basket (Table 5.18) was designed at the Department of School Health and Nutrition of the Ministry of Education and Human Development. All schools were required to use the standardised menu. The provision of a diversified meal at school needs to be balanced from a nutritional point of view. The basket was made up of different foods, capable of meeting at least 30% of the calorific needs and 20% of the vitamin and mineral needs. The sample meal plan prepared by the Ministry of education shown below was for 2569 beneficiaries at one of the NSFP schools.

Table 5-18: Sample meal plan from the Ministry of Education, 2014 for 2569 beneficiaries

Days of week	Menu plan	Quantity for meal preparation for 2569 beneficiaries
Monday	* **Xima** (Maize meal) and dry beans	Corn flour: 385 kgs, Beans: 77kgs, Oil: 25L Salt: 7kgs, Onions: 7.7kgs, Garlic: 2.5kgs
Tuesday	Vegetable rice (pumpkin and tomatoes)	Rice: 257kgs, Pumpkin: 51kgs, Tomatoes: 51kgs Oil: 25lit, Salt: 7kgs, Onions: 7.7kgs, Garlic: 2.5kgs
Wednesday	Xima with vegetables and peanuts	Corn flour: 385 kgs, Vegetable: 25kgs, Oil: 25L Salt: 7kgs, Onions: 7.7kgs, Garlic: 2.5kgs
Thursday	Vegetable rice with green beans	Rice: 257kgs, Green Beans:25kgs, Oil:25 L Salt: 7kgs, Onions: 7.7kgs, Garlic: 2.5kgs
Friday	Xima with nourishing beans	Corn flour: 385 kgs, Vegetables: 25kgs Bean: 77kgs, Oil: 25L, Salt: 7kgs, Onions: 7.7kgs, Garlic: 2.5kgs

*The word ***"xima"*** in the context of the table means a cooked porridge made from a locally grown staple such as corn (maize), cassava or sweet potato (yams).

Regarding the number of food products required for NSFP, participants mentioned that to calculate the quantities of each food item needed to be delivered, they used a set menu and the enrolment number of the learners. Thus, to establish the quantity required for each learner, the following formula was used: ***"amount per learner per day X number of learners enrolled/1000"***

To illustrate the formula, the study used data from one school purposively selected as an example, namely the complete primary school S130 (Table 5.19).

Table 5-19: Menu of school S130 (Enrolment: 2569)

Days of week	Food item	Portion size per learner
Monday	Xima (maize meal)	150g
	Beans	30g
	Cabbage	20g
	Oil	10g
Tuesday	Rice	100g
	Pumpkin	20g
	Green bean	10g
	Tomatoes	20g
	Oil	10g
Wednesday	Xima	150g
	Peanuts	20g
	carrots	20g
	Oil	10g
Thursday	Rice	100g
	Green been	10g
	carrots	20g
	Oil	10g
Friday	Xima	150g
	Beans	30g
	carrots	20g
	Cabbage	20g
	Oil	10g

As can be seen, xima and rice were consumed twice on average in the study area. However, it has also been observed by the researcher that the two commodities can be produced in large quantities; therefore, it seems to be clear that in future, foodstuff for NSFP can be sourced locally as discussed in section 5.8.3 and 5.8.4.

5.8.3 Theme 3: Process used by schools to procure food for NSFP

As a follow up question, the teachers were asked to state the process used by schools in buying the food from the source that they had identified. The purpose of this question was to establish whether there was an affirmative action to give priority to local farmers and business people from around the schools.

According to discussants and informants, the NSFP budget should be transferred directly to schools; so, schools were responsible for procurement of their own food using a quotation system. However, key informants interview revealed that the schools were not responsible for procurement of their own food. The participants mentioned that food items for the NSFP came from contracted service providers through a tendering procurement model at district or provincial levels. They only placed orders for school meals. The contracted supplier delivered

food items to the allocated schools, using the specified menu. The school staff members only checked the quantities delivered against the delivery note and invoice were using an open tendering system.

…. "*You know what my brother, the NSFP operational guidelines published in 2013/1276 provide that the NSFP budget should be transferred directly to schools; then we as schools were supposed to be responsible for acquiring our food, however, in practise it is not happening*." (S120: 1P).

"Sir let me explain for your understanding. The foodstuffs we use came from contracted service providers through a tendering procurement model at the district or provincial levels. We as the school authority only place orders for specific foods. The contracted supplier is responsible for delivering food items to the allocated schools, using the specified menu" (S140:2T).

The aim of the NSFP is that the programme is to stimulate an increase in agricultural production among local farmers because the farmers wouldn't have difficulties selling their farm produce. To test this aspect of the theory, the researcher asked the local people some questions regarding their agricultural activities.

5.8.4 Theme 4: Type of food crop grown in the study area

During the study, the researcher established through observation that the food that was commonly prepared for the learners was maizeflour, popularly known as "***Xima***." The researcher, therefore, wanted to find out if this was the staple food in the community and whether the farmers grew this crop. The responses are summarised in Table 5.21 below

Table 5-20 Vegetables are grown by farmers in the study area (n=32)

Food grown	Frequency	Percentage of respondents (farmers) %
Maize	38	78.2
Cassava	30	62.5
Peanut	25	52
Sweet Potatoes	22	45.8
Pumpkins	18	37.5
Cabbage	14	29.2
Beans	10	20.8
Rice	8	16.7
Groundnut	4	8.3
Total	169	100.0

From table 5-20, the majority of the farmers comprising 78.2 percent grow maize, which is an ingredient of the food that the schools prepare. This implies that there is an opportunity to encourage the farmers to grow more maize since the market is readily available among the schools. This response is in line with the NSFP purpose which encourages local food to be used in the programme to stimulate intensive farming of that local crop.[7,26]. Furthermore, participants were asked why they were growing large quantities of maize, cassava, peanut and sweet potatoes compared to other crops; they responded it was easier to grow these crops, and also are resistant to drought.

The head of the farmers' association said: "*as you see my friend, here in our district, there is potential to produce the required quantities for NSFP. However, we need government support to improve our production. F400:5M."*

Figure 5-6 below, shows the potential of crop production in the study area

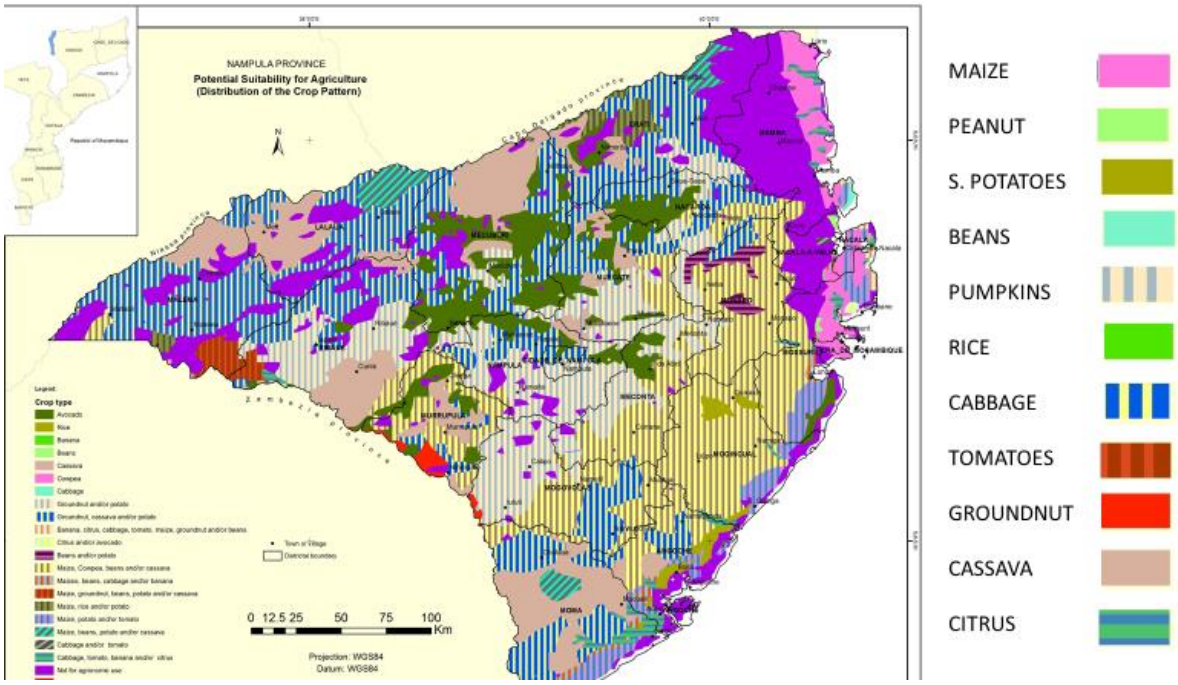

Figure 5-6: Potential of crop production in Nampula province

From the Table 5-21 and the map in Figure 5.6, the quantity of crops produced, such as maize, cassava, peanut, and beans, could potentially be sourced in large quantities from local farmers in future. It seems that there is a potential for food production to be enhanced and the food for school meals to be supplied by small holder farmers in Nampula province. However, for this

to happen, a shift in procurement strategy by the NSFP as well as better implementation of farmer support by the District Services of Economic Activities (DSEA) would be required.

5.8.5 Theme 6: Community awareness of the NSFP Opportunity

According to Bundy et al. a National School Feeding Programme should have strong community participation and ownership by the key stakeholders, including the beneficiaries' children,.[5] The programme should show that the community has been involved in the design and implementation of the programme and that the community contributes (to the extent possible) resources (cash, in-kind) to the programme. Therefore, the researcher wanted to establish whether the community was aware that they had an opportunity to improve on their economic status by growing more maize and other food crops to be sold to the school as required by the programme. According to responses summarized from FGDs with farmers indicated that they were aware of the existent programme in thetheir communities and the opportunity in terms of business opportunity, however, it seems that they did not benefited from presence of the programme due to the procurement models implemented that did not allow them in accessing the NSFP market.

5.9 Challenges experienced in the delivery of the NSFP in Nampula

The four NSFP school's principals were asked to identify the benefits of the programme for learners and the constraints found during implementation. According to the respondents, the NSFP was generally found to be useful and was highly appreciated. Major areas where the NSFP positively impacted included improved learner's attendance; also, increased enrolment in schools for both boys and girls.

Challenges were mainly the delay in delivering of food to schools, shortage of utensils (insufficient plates, cups and cutlery) and lack of good kitchen and food storage facilities. Problems related to systematic delays in delivering food was the most serious problem. In some schools, because of delays, principals mentioned that sometimes weeks passed without food and when this happened, children missed school, as there were no school meals.

CHAPTER FIVE:

CHAPTER SIX:

6 Summary, conclusions, and recommendations

6.1 Summary and conclusions

This chapter links the conclusions to the aim of the study, which was to assess the role of NSFP in enhancing school enrolment, attendance and retention and whether this could be supported by accessing food products from local farmers in Nampula Province. The enrolment, attendance, and retention were compared in primary schools with SFP and schools without SFP. An assessment was also made on whether the food used in the NSFP could be obtained from local farmers of Nampula province.

The study aimed to assess the role of NSFP in enhancing school enrolment, attendance, retention and whether this could be supported by accessing food products from local farmers in Nampula Province of Mozambique. The motivation for conducting the study was the fact that, the government of Mozambique, has been implementing a number of policy measures to at least minimize the negative impact of natural and manmade hazards on education, particularly, in stabilizing attendance, minimizing dropout, promoting the quality of education and nutritional status of learners at school level, as well as to boost agricultural production in the communities. Among the policy measures, NSFP is one of the measures the government had put in place in Mozambique.

Both quantitative and qualitative data were collected for the study. Purposive sampling and random sampling was used as part of the multi-stage sampling technique in the selection of study site and the participants. Multiple study design was used for data analysis. The Chi square tests and logistic regression models were used to predict the likelihood of enrolment and retention of learners in schools that either introduced or did not introduce school feeding programs; the Mann-Whitney test was used to compare the medians (number of days missed at school). Results were significant if $p<0.05$ (CI: 95%). Qualitative data were analysed thematically and then integrated into the findings of the quantitative data to strengthen the discussion.

The study found that half of the learners (52.9%) were in the age bracket of 13 to 15 years and the proportion of male to female learners interviewed was 57: 43%. However, regarding the number of children enrolled in primary schools, a great difference was observed between the SFP and non-SFP schools in 2014 and 2015. Thus, it could be inferred that any observed difference between the two groups regarding school participation could be attributed to the effect of the programme.

It was seen that the programme was functional in all four public primary schools selected for the pilot study in Nampula province. The school meal was served once a day (morning or afternoon) to all learners in school. Xima and rice was the common meal in all primary schools. It was found that there was no specific school hall for learners taking their meals. More than half of respondents reported being served the meal in their classroom. The study also found that the majority of learners reported to have available water in their schools, however, the source of water was wells, which was improper for consumption. This was confirmed during the field study that in some places, because of where the schools are located, drinking water had to be fetched from as far as 4-6 kilometres and beyond. Therefore, lack of water sources in or close to the schools not only contributes greatly to learners and school staff workload, but it can also result in learners dropping out of school altogether.

In general, learners were found to be satisfied with the NSFP, because they did not get hungry at school, therefore, alleviating short-term hunger which is the main objective of NSFP. It was also found that the food they received was of good quality.

Between 2013 and 2015, the total number of enrolment in the NSFP schools was 24 770 and 7 556 for non-SFP schools. The implementation of the pilot phase of the NSFP was done in 2014 which resulted in a 30.5% enrolment increase from the baseline year (2013). This finding is similar to a study carried out by Gilligan in 2009 in Bangladesh, where NSFP increased enrolment by 14 %.[12] Findings regarding grade enrolment in NSFP and non-NSFP suggested that schools with NSFPs showed a proportionate increase in enrolments within grades across years (Figure 5-1), while non-NSFP schools showed a proportionate decrease in enrolments within grades across years (Table 5-11). The school with feeding schemes had a positive associative effect on enrolment in Nampula province of Mozambique. This was also evidenced by the grade enrolment within NSFP schools in 2014 which had decreased odds of 0.96 ($p<.001$), suggesting that after the introduction of NSFP, increase in grade level had a 4%

increased enrolment likelihood. This was a reversal of the odds in 2013 with the likelihood of enrolment decreasing by 12 % with increase in grade level.

Across the years of investigation, the NSFP schools did have fewer drop outs in comparison to non NSFP schools. The odds of dropping out in an NSFP school was 0.56 compared to those enrolled in a non-SFP school in the baseline year, 2013. This protective effect of NSFP schools could be attributed to the pilot phase criteria applied in selecting the schools to receive the intervention. These results were similar to a study conducted in Argentine by Adrogue and Orlicki (2013)[85].

During the data collection process, it was observed that the NSFP schools had better location, in the village near main roads, and had improved infrastructure with conventional buildings as compared to the non-NSFP schools (comparisons schools). These features thus could have created higher preferences for locals enrolling their children in the NSFP schools. Upon introduction of the NSFP, in 2014 and 2015 the odds of dropping out further decreased to 0.25 ($p < .001$) and to 0.07 ($p < .001$) respectively. This finding suggests that the reduction of dropping out by 31% between 2013 and 2014, and a further 18% by 2015 can be attributed to NSFP. This may also indicate that children that had dropped out of school previously due to hunger, must have, come back once school feeding was introduced. According to Afoakwa, a hunger-stricken child cannot attend school properly even if enrolled[1]. Besides, such children are also likely to quit school because they have to deal with their immediate subsistence needs before they get ready for schooling[1]. A gender perspective was also investigated, and the findings suggest that there was a statistically significant association between schools with NSFP and Non SFP by gender enrolment ($p < .001$). Introduction of NSFP could have improved female gender enrolment in schools with feeding program compared to those without feeding program in the Nampula province of Mozambique. These findings accord with previous studies that NSFPs motivate parents to enrol especially girls[2,86].

Comparison of enrolment between NSFP and non NSFP suggests that there was a significant difference across the three years under investigation ($p < .001$). Including the baseline year 2013, probably because the community was aware the NSFP was coming in those schools in 2014 and 2015, as well as the effect of changes in Government policy. This is consistent with findings by (Abdullahi, 2014; Cheung and Berlin, 2015; Kaguongo, 213; Kariuki et al., 2013 and Hall et al., 2007), who argued that NSFPs generally have positive effects on school

enrolment[87,88,89,90,91]. However, the results are different from Jacoby *et al.* in Chile who found out that school feeding has no significant effect on enrolment in schools but found out that the programme was popular with educators and politicians.

Regarding learner's retention, the results suggests that there was higher learner retention in the NSFP schools only after school meal was a reality (Figure 5 3 and Figure 5 4). However, it was also observed that in NSFP schools, the retention rate decreased remarkably for grade seven learners in 2014 and further increased again in 2015. (Figure 5 4). According to local sources, there was severe flooding in the area in 2014, which possibly meant that older children had to stay at home and help to mitigate the damage.

Learners enrolled in an NSFP school were significantly associated with retention having decreased odds of 0.56 ($p<.001$) in 2013 which further decreased 0.25 ($p <.001$) after the introduction of the programme. This suggests that 31% attributed increased likelihood of retention between 2013 and 2014 in NSFP schools compare to non NSFP schools. Thus, indicating that the implementation of the NSFP had significantly improved learners' retention in school compared to the period before the introduction of the programme. This was fairly similar to the findings of others[26] that short-term hunger alleviation through the NSFPs enabled learners to have access to education. Furthermore, learners suffering from short-term hunger and increased levels of malnutrition are said to be retained in school when provided with meals at school.[92] These findings were also reported by Adelman et al. (2012) who argued that school feeding programme enhanced school retention and performance both in short and in the long run. In the short run, school meals could alleviate hunger and make children concentrate and learn better so that school performance will be improved and hence drop-out is minimized.

These findings confirm and extend the findings of previous research studies in which a statistically significant association was found between NSFP and learners retention in schools under experiment[69,93]. Children's readiness to come to school and attend is influenced by the extent to which their parents value the food their children receive in school premises[3]. Thus, from the results of this study, it appears that parents well value the NSFP in the study area because it has encouraged them to send children to school even during the seasonal demand for agriculture. For instance, one farmer household head said the following during the Focus Group Discussion:

… "*the maize harvesting season is a period when all members of the household should help. During this time, we make more money from maize sale than any other season and hence the help of all members of the family is essential. However, even though, I advise my children to join the family after coming back from school because in future I would like to see my child to become an important man in our community" (F100: 2M)*.

Concerning learner attendance, the results of the study showed that the NSFP schools exponentially enhanced learners attendance than schools without NSFP. This was because comparing the median between the schools with NSFP and schools without NSFP for grade 3 learners, in 2013 (baseline), both schools had the same median, only differing slightly in the confidence intervals. However, a different trend was seen in 2014 after the introduction of NSFP, where there was a significant difference in the median of the schools with NSFP and those without NSFP, this is made clear when the range is considered. The number of days absent in the NSFP school range from (4-19) compared to (3-94) in non-NSFP schools. This same trend could be seen in 2015, where the range for NSFP school was (2-9) and (2-94) for schools without NSFP.

There was also a significant difference in their median values as shown with the non-overlapping 95% Confidence intervals of the median between the two groups ($p<.001$). The results are in agreement with what Gilligan (2009) found out in a study carried out in Bangladesh that NSFP increased school attendance by 6%.[92] Duggan, Watkins, Walter (2008) linked the improved rates of attendance and punctuality to the introduction of universal school breakfast programmes. An evaluation of NSFP by Yendaw and Dayour (2015) showed a 36% increase in attendance[92,93,94]. This is substantiated by published findings by [20,45] that the provision of school meals does not only attract children to school but also it makes them attend regularly [45,95].

Based on the study findings, it could be infered that the school meal provision was able to alleviate hunger since the beneficiary children argued that the food they receive in school was of good quality and also enough to satisfy them, which contributes to their class attendance. The principal of school S150 also reiterated this opinion arguing that:

"each learner here receives enough food a day because there are children who come from distant areas walking 2-3 hours daily. Therefore, they need enough food to ensure the energy

they need to concentrate in school. For these reasons, children stay longer in school and do not miss school (S150: 1P)".

Concerning the composition of NSFP food basket, the study found that all NSFP school were using a cooked menu based on recommended meal plans and approved national menus. The menu included seasonal agricultural produce such as vegetables. Xima and rice were consumed twice on average in the study area. However, according to the discussants and informants, Nampula province has a good production climate for vegetable/crops, and the same can be produced all year-round (March-October) with no out-of-season problem for most crops. This implies that there is an opportunity to encourage the farmers to grow more of these crops since the market is readily available among the schools. This response is in line with the NSFP purpose which encourages local food to be used in the programme to stimulate intensive farming of that local crop; therefore, it seems to be clear that in future, foodstuff for NSFP can be sourced locally.

The study ascertained that the NSFP operational guidelines published in 2010/12 (*Ministry of Education and Human Development, 2013*), directs that the NSFP budget should be transferred directly to schools; so that schools are responsible for procurement of their own food using a quotation system. However, as evidenced from the study, all NSFP schools surveyed received food items via a trader or an intermediary. In this case, all food items came through distributors or intermediaries, while nothing came directly from local farmers because the procurement procedures do not allow these schools to purchase food from them as the current procurement model restrict them. This defeats the objectives and theory of NSFP as espoused by Bundy et al. (2009). It also contradicts Bodo (2012) who had indicated that the programme had empowered the local community[5,96]. This implies that the vision of increasing local agricultural production and having the NSFP money to circulate among the local community as a way of improving their economic status cannot be realized.

Notwithstanding the positive impacts of the National school feeding programme as discussed above, there were a number of bottlenecks that beset the implementation of the programme at the Nampula province. The results of the study indicated that schools lacked adequate infrastructure for the programme, including cooking facilities, storage facilities to protect food from spoilage, equipment such as plates and cutlery, refrigerators and some kitchen equipment which were found not to be sufficient. This supports the work done by Afoakwa (2008)

suggesting that the school feeding programme is successful but with challenges[1]. In all NSFP schools the fuel to feed the stoves was firewood. This made the SFP less eco-friendly. Cooking meals using firewood also has disadvantages, like the destruction of forests and occupational risks to cooks because of an open fire.

Problems related to systematic delays in delivering food and insufficient plates was the most serious problem. Principals from two schools had this to say:

"*Learners complained of insufficient plates, cups and cutlery. They, therefore, have to wait for other learners to finish eating and wash their bowls so that they can collect them and take their turn. The alternative is for two learners to eat from a communal dish which will create inconvenience*".

6.2 Conclusions

The study showed that there was a proportionate increase in enrolments within grades across the three years in schools with SFPs, while non-SFP schools showed a proportionate decrease in enrolments. Because SFP provided both personal and family incentives for children to go to school despite the perceived barriers to school attendance, there was a proportionate increase in enrolments across all grades in 2014 and 2015 in SFP schools. A possible explanation for increased enrolment in 2013 before the introduction of SFP, could be due to Government policy in promoting school attendance through the abolition of school fees and provision of free text books. Therefore, these policy directives brought willingness on the part of parents to enrol their children with a sharp increase in school enrolments in 2013.

Aside from the contribution of the SFP to increased enrolment trends, it also had a positive influence on retention rates. The retention rates in schools with SFP improved in 2014 and 2015, while the retention rates in non-SFP schools remained constant across all three years. As a consequence of the presence of the SFP, in schools that implemented SFPs, many more children were still present at the end of the 2014 and 2015 academic years compared to 2013 and compared to retention in schools that did not provide school meals. This was probably because school meals significantly decreased hunger which is related to school drop-outs. However, it was also observed that in SFP schools, the retention rate decreased remarkably for grade seven learners in 2014 and increased again in 2015. According to local sources, there

was severe flooding in the area in 2014, which possibly meant that older children had to stay at home and help to respond to the crisis

The study also found a significant increase in attendance in schools that participated in the feeding scheme. This could primarily be due to the existence of school meals that motivated children to be able to come to school and stay there for the whole day. On the other hand, it was also found that the quality and size of the meals allocated for the learners was large enough to encourage their school attendance. Although it was recognized that children play a role in household activities, parents send them to school because it seemed they perceive the benefit of doing so.

The study concluded that the NSFP used centralised procurement model instead of a school-based model as indicated in the NSFP guidelines. Therefore, most food items for the NSFP came from traders or intermediary and nothing were sourced from local farmers. It appears that the procurement model used was not the ideal because it does not place emphasis on community involvement.

Although the school menu developed was based on local production, there are no linkages between farmers and the schools because the NSFP implementation and procurement modalities are not favourable. Moreover, the centralised procurement system being used has excluded schools from procurement decision making. Instead, service providers are being used for procurement, with no input from schools and communities about how the funds are utilised. Therefore, the study concludes that there is lack of ownership and management of NSFP at school level, since there is little authority at the school level to determine where food is purchased.

The study found that most food used in the NSFP is produced in large quantities within the beneficiaries' districts. This therefore, gives a good indication that in the future the food items for the NSFP can be supplied by the local producers.

The study also concluded that the government can play a key role in developing the local economy by empowering small farmers. The NSFP project is strategically positioned to meet those needs. More creativity is needed for projects, such as the NSFP, to impact the lives of beneficiary communities. Structured obstacles should be removed to facilitate more economic activity in previously disadvantaged communities. This could potentially reduce the scourge of

unemployment in the communities and also enhance the nutrition and quality of education in schools in Nampula province of Mozambique.

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Based on the study findings, it can be concluded that the National School feeding programme appears to have had a positive role in the educational variables identified as part of the assessment. Furthermore, it is apparent that the programme is highly valued by all school stakeholders.

6.3 Recommendations

The benefits and achievements of the NSFP are undoubtable. However, the programme has several challenges that must be addressed to enable it to achieve its full potential. First, the decentralized procurement system proposed for the programme is not taking place in practise. Instead, food for NSFP is being delivered by suppliers, with no input from the schools and communities about how the funds are utilized. As a consequence, farmers in the study area, are not enjoying the benefits of SFP yet.

Procurement methods and procedures

The tender programme used for accessing food ingredients for the SFP has been currently managed nationally. This may be because it was a pilot phase. In future, more regional or local control of the supply of food ingredients may be preferable. This could open the way to using locally produced ingredients. Therefore, the following is recommended:

- Buying foodstuffs from local farmers for the SFP is more cost effective and would encourage increased local food production;
- There is a need for Government to set up a flexible system of procurement that farmers can easily adhere to;
- It is important to strengthen the community participation in organizing and implementing SFPs. This is because community assists schools to offer certain advantages such as increasing the contacts, and hence communication between parents and teachers, officials and others; giving parents the opportunity to become more aware of what goes on at schools and serving to raise the value of education/the school for parents and the whole community.

School environment improvement

- The SFP needs to be supported by improved infrastructure, such as kitchen, storage and dining hall facilities for learners at the school level for the smooth execution of the programme and also to prevent food spoilage.
- Environmentally friendly alternative sources of fuel or energy saving stoves should replace the common source of fuel (fire wood) and traditional three-stone stove.

Improvements to the school meal

- SFP coordinators at district and school levels should identify and address any potential aspects that hinder SFP implementation. It was reported that there are systematic delays in commencing SFP every semester, due to administrative inefficiencies. This should be avoided to minimize the number of days with no feeding since delay could also undermine the impacts of school feeding on school participation;
- The study shows that school meals were provided during the break period of the schools, and thus children who travel long distances to reach school remain hungry during the first half of the school day. SFP coordinators should, therefore, consider the possibility of serving meals early in the day before the lesson begins so that children do not leave school early in the day. Such adjustment also makes children concentrate during the entire school period;
- Provision of specific serving and dining space for learners is therefore required, rather than the current classroom arrangements.

Monitoring and evaluation system

Beyond the pilot project, mechanisms need to be put in place for continued monitoring and evaluation of the feeding programme.

- During the pilot phase, some issues arose around data collection, and these impact on the efficacy of the data. The NSFP coordinator could work with schools to develop systems for monitoring and evaluation of programmes through, for example, the creation of templates for schools to enter performance and attendance data on a monthly or term-by-term basis to facilitate data collection and further information of school feeding programme.
- Build a reliable framework that focuses on how school feeding can effectively contribute to improving educational outcomes and meeting the nutrition and health needs of school age children;
- Ownership of the program should be gradually transferred to the government, communities, and schools or other local or national actors with the will and capacity to continue supporting the improvement of enrolment, attendance, dropout and quality of learning at the schools.

Effective linkages with agriculture

- The linkage between local farmers and the programme is weak because local farmers are not properly connected to the supply chain., There is, therefore, a need for policy amendment that should include the creation of proper policies that would link local farmers to the SFP in schools.
- From the findings as observed in schools, xima, beans, and rice are consumed throughout the week as the primary staple. Therefore, smallholder farmers could capitalise the opportunity provided by NSFP market by expanding their production capacity. This, however, will require farmers to be well organized, and equipped through dedicated agricultural extension support to supply foodstuffs on a regular basis.
- Instead of having a standard menu for all schools across the different provinces, there should be a regional variation of the menu which considers the production potential and preferences of each region. For example, cassava is an important agricultural product produced in large quantities in the study area. It is known to be drought resistant and included as part of traditional food in Nampula province and is thus easily available in prepared form locally. However, it is not included in school meals. This should be reconsidered.

Finally, the evidence presented in this assessment supports the continuation and expansion of the National school feeding programme. However, for the sustainability of the programme the government should engage in a public-private partnership. Given the high rates of poverty experienced by many children in Mozambique and the benefits of school feeding, the model could warrant a broader replication within the country.

6.4 Recommendations for further research

The Ministry of Education and Human Development, Ministry of Health and Academic Institutions in Mozambique, should team up to conduct more studies on SFP with a larger population size, considering more variables relevant to the topic to obtain more insight and to establish further ways in which the SFP in schools could be improved.

Further research is needed on how small-scale farmers could be better included in SFP and what support is needed.

As mentioned there are administrative barriers to efficient supply of food. The district education authority should explore different methods of procurement using a research approach to determine the most efficient method of providing a market for the farmers while maintaining sound procurement procedures.

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8 APPENDICES

APPENDIX A: Questionnaires

APPENDIX - A1

An assessment of school feeding programme - pilot phase and its relationship with enrolment, attendance, retention and the local agricultural production in Nampula province in Mozambique

INTERVIEW QUESTIONNAIRE used with Principal (Please answer all questions)

Name of school---------- Date of interview----------

Name of respondent ---------- Gender M ( ) Female ( )

Name of interviewer ----------

SECTION I –ACCESS, ATTENDANCE AND LEARNERS DROPOUT

2.1 Please, provide the average enrolment of learners (in figures) from 2013/2014 academic year to 2014/2015 academic year in the table below.

2.2. How many learners were enrolled in each class?

Classes	2013/2014		2014/2015		2015/2016	
	Male	Female	Male	Female	Male	Female
Grade 1						
Grade 2						
Grade 3						
Grade 4						
Grade 5						
Grade 6						
Grade 7						
Total						

2.3. On the table below, please provide a termly average attendance of learners per grade. That is; from 2013/2014 academic year to 2014/2015 academic year.

NAMES OF PUPILS	Grade 3 - Average attendance per school & year.					
	2013/2014		**2014/2015**		**2015/2016**	
	Male	Female	Male	Female	Male	Female
Total number of days opened for attendance in the academic years						

1.4. Please, provide the total school dropout (in figures) from 2013/2014 academic year to 2014/2015 academic year in the table below.

Grade	**2013/2014**		**2014/2015**		**2015/2016**	
	Number of Boys	Number of Girls	Number of Boys	Number of Girls	Number of Boys	Number of Girls
Grade 1						
Grade 2						
Grade 3						
Grade 4						
Grade 5						
Grade 6						
Grade 7						
Total						

2.4.1 Was there any dropout in your school? 1. [ ] yes 2. [ ] No [**if no skip questions 2.3.2 and 2.3.3**]

2.4.2 If yes, how many pupils prematurely dropped out of school from 2013/2014 academic year to 2014/2015 academic year?

2.4.3 What were the reasons caused them to dropout?

Kindly tick the options below appropriately

Reason	**Tick where appropriate**	**Boys**	**Girls**	**Total**
To engage in family economic activities				
Long distance from home to school				
Other, please specify				
To engage in family economic activities				

SECTION III – SCHOOL FEEDING PROGRAMME

3.1 Does the school provided school meal? 1. [ ] Yes 2. [ ] No

3.2 If Yes, was the school feeding programme running in term 1 2013? 1. [ ] Yes 2. [ ] No

3.3 If No, when was the last time the school had a school feeding programme? ___ [ ]2013, year 2014 [ ] year 2015 [ ] Other (specify)_____

4.4 What school feeding was it? 1. [ ] regular (Government) school feeding 2. [ ] International Agencies SF 3. [ ] HGSF

4.5 Are you aware that regular school feeding programmes has changed to Home Grown School Feeding? 1. [ ] Yes 2. [ ] No

4.6 If yes, what will be different with the new programme (HGSF)? [**Can be multiple responses**]

1. [ ] Cash transfer 2. [ ] the school will tender for the feeding contract with the school 3. [ ] the school will buy from local farmers 4. [ ] Other Specify_____

4.7 Does the school have a dedicated school feeding account? 1. [ ] Yes 2. [ ] No

4.8 Were there any times when school feeding was unable to reach the intended beneficiaries? 1. [ ] Yes 2. [ ] No

4.9 If Yes, what was the reasons? _____

4.10 How many days did the school go without food?_____

4.11 What were the gaps or shortfalls due to?_____

1. [ ] Luck of funds 2. [ ] Late delivery 3. [ ] Less food delivery than expected 4. [ ] Insufficient funds disbursement 5. [ ] Other (specify) _____

4.12. Were there any other challenges in this school associated with school meals? 1. [ ] Yes 2. [ ] No [**If no skip to Q14**]

4.13. If Yes, what were they?_____

1. [ ] High cost of transportation; 2. [ ]Late disbursement of funds to school; 3. [ ] Long procurement process; 4. [ ] Increase enrolment over time; 5. [ ] Some pupils dropped out due to lack of school meal;

6. [ ] Other (specify)_____

4.14. How often was food delivered to the school?

1. [ ] Once a week; 2. [ ]quarterly; 3.[ ] once a month; 4.[ ]other (specify)_____

4.15. Which of the following foods were regularly served in the programme? (Tick if particular commodity was served).

1. Meal maize [ ]; 2.Meat [ ]; 3. Rice [ ] 4. Beans [ ]; 5.Hot porridge [ ]; 6.Fish [ ]

4.16. Where do the food commodities come from? (can be multiple answers)

1. [ ] World Food Programme (WFP); 2. [ ]Purchase for progress; 3. [ ]Local farmers; 4. [ ]Other (specify)_____

SECTION V - FOOD PREPARATION AND COOKING

5.1. Is the food prepared within the school compound? 1. [ ] Yes; 2.[ ] No

5.2. Does the school have a school kitchen? 1. [ ] Yes; 2. [ ] No

5.3. Where did the meals served to the learners? [ ] classroom; [ ]eating area; [ ] within the school compound.

5.4. Who cooks the food? [ ] Cooks; [ ]Parents; [ ]Pupils; [ ]Others (specify)_____

5.5. Do they get remunerated on work or volunteer basis? [] Hired; [ ]Volunteer

5.6. Who decides the menu? 1. School feeding programme [ ]; 2. School Management Committee [ ]; 3. Teacher responsible for School feeding [ ]; 4. Other [ ] specify_____

5.7. Where were the meals prepared? [**If answer is 2 skip to Q 5.8**]

1. In the school kitchen [ ]; 2. Elsewhere [ ] Specify_____

5.8. If your answer is 1, have you received any support to improve your school kitchen? 1. Yes [ ] 2.No [ ]

5.9. If Yes, from whom? 1. Local Government [ ]; 2. WFP [ ]; 3. Private sector [ ]; 4. Other [ ] specify_____

Thanks, you

APPENDIX – A2

An assessment of school feeding programme - pilot phase and its relationship with enrolment, attendance, retention and the local agricultural production in Nampula province in Mozambique

INTERVIEW QUESTIONNAIRE used with Teachers coordinating SFP at school level (Please answer all questions)

Name of school---------- Date of interview----------

Name of respondent ---------- Gender M ( ) Female ( )

Name of interviewer ----------

2. What are your specific roles in the NSFP? ----------
   ----
3. Is it in harmony or conflict with your other teaching roles? How?

Programmatic Information

1. What are the objectives of the NSFP? ----------
   ----
2. In implementing the NSNP at this school do you have any guidelines or standards?

---
3. How many children are targeted by the NSFP in your school?

---
4. How many children are receiving the meals from NSFP?

---
5. Which meals are served in the NSFP?

---
6. Who decides on the menu?

---
7. What time are these meals served? Why? And Where?

---
8. Are the learners supervised during meal times?
9. Who is responsible for ensuring that the correct children receive the meals?

Supplies and food handlers

1. Where do you get the food supplies for the NSFP?

---

2. Who decides on what to order and how frequent it should be done?

---

3. How do you ensure the quality of the meal offered to school children?

---

4. How are community members involved in the NSFP at this school?

---

5. How are community members selected for participation in the programme?

---

6. How is food handlers selected?

---

7. Are they volunteers or fully paid staff?

---

8. How are they supervised to enable them to take on these roles?

Opinion of programme

1. What in your opinion is being done well in the implementation of the NSFP? Explain with examples.

---

2. What in your opinion could be improved on regarding the implementation of the NSFP?

---

3. What are the challenges you are facing as a school teacher responsible for school meals regarding implementing the NSNFP?

---

4. In your opinion how can these challenges be solved?

APPENDIX – A3

An assessment of school feeding programme - pilot phase and its relationship with enrolment, attendance, retention and the local agricultural production in Nampula province in Mozambique

INTERVIEW QUESTIONNAIRE used with learners selected from SFP schools (Please answer all questions)

Name of school---------- Date of interview----------

Name of respondent ---------- Gender M ( ) Female ( )

Name of interviewer ----------

This research intends to "assess the school feeding programme - pilot phase and its relationship with enrolment, attendance, retention and the local agricultural production in Nampula province in Mozambique." Your participation is very important, and the information you give us will be confidential and used only for the study. Although your parents have authorized us to interview, we would still like to point out that your participation is voluntary. Do you have a question before we proceed? If you do not have any question, may we proceed?

SECTION I – BACKGROUND INFORMATION

1. Date: / / /2016/
2. Interviewer Name: _____
3. Name of the Province: _____
4. Name of the District: _____
5. Name of Primary School: _____
6. Learners Name: _____

SECTIO II – DEMOGRAPHIC INFORMATION

2.1. Sex (Record Male / Female as observed) 1. Male [ ] 2. Female [ ]

2.2. What is your date of birth?

└┴┘ └┴┘ └┴┴┴┘ (**If known, Go to 1.4**)

2.3. How old are you? Years ⌊__⌋⌊__⌋

2.4. Which Class/grade are you? ⌊__⌋⌊__⌋

2.5. Have you missed school in last six months? 1. Yes [ ] 2. No [ ]

2.6. What were the reasons? 1. Family work load [ ]; 2. Sickness [ ] 3. Long distance from home to school [ ]

2.7. Have you repeated a class? 1. Yes [ ] 2. No [ ]

SECTION III – SCHOOL FACILITIES

3.1. Does your school have functional toilet facilities? 1. [ ] Yes 2. [ ] No

3.2. If Yes, how many functional toilet facilities does school have? 1. Boys [ ] 2. Girls [ ]

3.3. What type of toilet facilities does the school have? 1. [ ] Flush toilets 2. [ ] Ordinary latrine

3. [ ] Others (Specify)

3.4. Do you wash your hands before eating? 1. [ ] Yes 2. [ ] No

3.5. Is there a source of drinking water in the school compound? 1. [ ] Yes; 2. [ ] No

3.6. If yes, what is the source of water? 1. [ ] tape water; 2. [ ] rain water; 3. [ ] well water

SCHOOL IV - FEEDING PROGRAMME

4.1. Is there a feeding scheme in your school? 1. Yes [ ] 2. No [ ]

4.2. Is the feeding scheme available for all the children? 1. Yes [ ] 2.No [ ]

4.3. What days of the week did you receive food at school? (**Can be multiple responses**)

Monday [ ] Tuesday [ ] Wednesday [ ] Thursday [ ] Friday [ ]

4.4. Which of the following foods were regularly served to learners? (**Can be multiple responses**)

Maize [ ]; Vegetables [ ]; Beans [ ]; Meat [ ]; Porridge [ ] Rice [ ]

Other: (specify)

4.5. Where are the meals served to the learners? (Please tick)

Kitchen [ ]; Classroom [ ]; Eating area [ ]; other (Specify) ----------

---

4.6. At what time is food served in this school?

In the morning [ ]; Mid-day [ ]; In the Afternoon [ ]

4.7. Is the food that you receive enough/satisfy your hunger? 1. Yes [ ] 2. No [ ]

4.8. If No, why are you not satisfied?

4.9. Are you satisfied with the quality of the food you received? 1. Yes [ ] 2.No [ ]

4.10. If No, can you please explain why?

4.11. Is the food that you receive at a school similar to what you eat at home? 1. Yes [ ] 2.No []

4.12. Does your school have a food garden to supplement school feeding? (**If no skip to 4.14**)

1. Yes [ ] 2. No [ ]

4.13. Where is the garden located? 1. In the school compound [ ] 2. Outside the school compound. [ ]

4.14. Are you satisfied with the school meal programme? 1. Yes [ ] 2. No [ ]

4.15. If No, what is the main reason you are not satisfied? _____

4.16. Do you think the school meal should be stopped or continued? 1. Yes [ ] No [ ]

4.17. If you think it must be stopped, why?

1.18. If you think it must be continued, why?

4.19.Who cleans the plates and spoons when you have finished eating?

4.20.Do your parents/guardians ever complain about these meals?

Thank you for your time

APPENDIX -A4

An assessment of school feeding programme - pilot phase and its relationship with enrolment, attendance, retention and the local agricultural production in Nampula province in Mozambique

INTERVIEW QUESTIONNAIRE used with Cooks (Please answer all questions)

Name of school---------- Date of interview----------

Name of respondent ---------- Gender M ( ) Female ( )

Name of interviewer ----------

1. How long have you been a cook at this school?

---

2. What type of meals do you serve?

---

3. When do you serve the meals?

---

4. To whom do you serve the meals?

5. How many learners are served the meals every day?

---

6. Where do you serve the meals?

---

7. Do you have some leaners receiving take home rations?

8. Do you have adequate water-to prepare the food? Where does it come from?

9. Where do you prepare the food?

10. Are you happy with the facility where food is prepared?
(Researcher to observe the status of food preparation area).

---

11. How many other people are involved in the preparation of food?

---

12. How long does it take you to prepare the meals?

---

13. Where is the food stored before and after meals? Ask about both perishable and non-perishable foods.

---

14. Researcher to observe where food is stored. (Dry food commodities should be stored above the ground, not on the floor).

---

15. How do you dispose or store any remaining prepared meals?

---

16. Who manages the menu, who decides what meals the children should have on any day?

---

17. Who is responsible for cleaning the utensils after the learners have had the meals?

20. Has any training been given to you as a food handler/cook?

Opinion of programme

1. Do you think that the food provided is enough for the learners? Explain.

---

2. If you could, what would you change about the way in which these meals are given to learners?

---

3. Have some children ever complained about stomach upsets at the same time such that you though it may have been the food you serve?

---

4. What in your opinion is being done well in the NSFP? Explain with examples

---

5. What in your opinion could be improved on regarding the NSFP?

---

6. What are the challenges you are facing as a food handler in carrying out your duties in the NSFP?

Thank you

APPENDIX A5

An assessment of school feeding programme - pilot phase and its relationship with enrolment, attendance, retention and the local agricultural production in Nampula province in Mozambique

INTERVIEW QUESTIONNAIRE used with Provincial & District programme coordinators (Please answer all questions)

Name of school---------- Date of interview----------

Name of respondent ---------- Gender M ( ) Female ( )

Name of interviewer ----------

Background of respondent

1. What is your role in the province/district regarding the National School Nutrition Programme?
2. For how long have you had this role?
3. If less than two years, was your previous role linked to the NSFP? How?

Legislation and Policy framework

1. What are the objectives of the NSFP?
2. What are the policies that guide the school feeding programme in the country/ your province/in the district?
3. Are there any policies or legal frameworks that have been developed specifically for this district?
4. Is there a nation-wide guideline or operational plan or framework that specifies?
    a. How to select schools for the NSFP?
    b. How to select the children who benefit from the NSFP?
    c. How to select suppliers for the NSFP?
    d. How to select the food handlers for the NSFP?
    e. What needs to be in place, infrastructural and legally for the implementation of the NSFP?
5. Are you aware of how the NSFP program relates with other social protection and educational programs at provincial/ district? How?

Institutional capacity and coordination

1. What is your understanding of the role that Department of Basic Education has regarding the NSFP?
2. What is the role of the Department of Agriculture in the NSFP?
3. What is the role of the Department of Health NSFP?
4. Are you aware of any documents or forums created to enhance the collaboration among key government departments regarding the NSFP?
5. What is your opinion on how the NSFP is coordinated in the country? In the province?
6. How is the programme rolled out?
    a. What are the roles of the different people at national, provincial and district level?
    b. What informs these roles?

Human resources

1. Are there particular individuals who at provincial and district level that are responsible for the NSFP?
2. How are the responsible persons selected? What are their profiles or qualifications?
3. Is there an organogram for the NSFP office at district, provincial level or national level?

Information

1. How is the information on the number of children reached through the NSFP collected?
2. Is there any software or data management system being used?
3. How are the targets set and reported on?
4. Is there a monitoring and evaluation plan for the NSFP at district, provincial or national level? (Is the monitoring and evaluation done internally or externally?)
5. How many children receive meals in this district/province annually?

Financing

1. How is the NSFP financed?
2. Where do the funds come from (national tax payer funds, donor funds, trust funds or private sector donations, etc.)?
3. How are the funds disbursed and who decides on the amounts to disburse?
4. How is the budgeting done at the district/provincial /national level?
5. How are the funds for the program managed at district/province level?

6. What measures are in place to ensure that the funds are used for the NSFP programme and not rechannelled to other programmes?
7. Do you have any documents that show the cost for providing a meal per child per day (cost per child per day?)
8. How is the procurement currently being done?
9. How are contracting arrangements made for service providers/suppliers, voluntary food handlers, etc?
10. Is there a link between the procurement for the NSFP and other food-based programs by the Government of South Africa?
11. At which level is procurement done? (national, provincial, district, school, etc.)
12. Which departments/entities are involved in the procurement process?
13. Is the programme outsourced to private companies in charge of purchasing, delivering and preparing the food? (e.g., caterer model)
14. Who selects the procurement, model? (i.e. centralised / decentralised)

Community participation

1. Are the communities involved in the design of the programme?
2. How are they involved and what is their role?
3. How are community members selected for participation in the programme?
4. Are they compensated for the role they play? How much are they compensated?
5. How are the community members supervised/trained to enable them to take on these roles?

Opinion of programme

2. What in your opinion is being done well in the implementation of the NSFP? Explain with examples
3. What in your opinion could be improved on regarding the implementation of the NSFP?
4. What are the challenges you are facing at the provincial level regarding implementing the NSFP?
5. In your opinion how can these challenges be solved?

Any other comments

APPENDIX A6

An assessment of school feeding programme - pilot phase and its relationship with enrolment, attendance, retention and the local agricultural production in Nampula province in Mozambique

Focus Group Guide for Farmers

This form is designed to collect information about the selected farmers in the districts that implement School Feeding Programme. The information collected will help our understanding not only of the food you supplied to the school for the School Feeding Programme but also the relation with the expected outcomes on the educational and agricultural development in the Nampula province. We would still like to point out that your participation in the discussions is voluntary. We would like to tape record the discussion so that we don't miss anything important. Do you have a question before we proceed? If you do not have any more questions, may we proceed?

DEMOGRAPHICS INFORMATION

Na me of District: _____
Interviewer name: _____
Position: _____

Background of the Respondent

1. Note down how many male ( ) and females ( )
2. What is your current role in the NSFP?
3. How did you get involved in this role?

Food procurement

1. Are you organized in some association? If not, why?
2. Is the food procured from you individually or by a group of farmers?
3. What do you supply (list all the foods supplied)? How much (quantities)?
4. Where do you get the produce that you supply to the school?
5. Have you received training on the food production process?

Agreements and contracts

1. Are you currently on any legal contract with the school/district/provincial office to supply for the NSFP?
2. What kind of contract? For how long is the contract?
3. If the food required is not available how do you decide on the substitute?
4. How do you ensure that you supply quality food?
5. Are you able to get the quantities required by the school? (ask this for each food item)
6. What do you do if the school requires certain food items that are currently not available?
7. How frequently do you supply the school?
8. How is the payment made for the food you supply? How does that affect you?

Opinion

1. What is your opinion on this NSFP?
2. How would you improve on the way that supplies are procured from you if you could?
3. What are the challenges that you are faced with as you supply the required food? (Should include challenges in production as well as in delivery processes).
4. Have you received any assistance or support from Government, NGOs or other?
5. Finally, what support would you like to see in agriculture to help in improving the farming?

Thank for your assistance

APPENDIX -A7

An assessment of school feeding programme - pilot phase and its relationship with enrolment, attendance, retention and the local agricultural production in Nampula province in Mozambique

Focus Group Guide for School Council/Parents Committee

This form is designed to collect information in selected districts that implemented School Feeding Programme and would like to spend the next 40-60 minutes discussing how you find the NSFP value. The information you provide will be confidential and will help our understanding of the process of how the Pilot National School Feeding Programme was implemented in your district. We would still like to point out that your participation in the discussions is voluntary. We would like to tape record the discussion so that we don't miss anything important. Do you have a question before we proceed? If you do not have any more questions, may we proceed?

DEMOGRAPHICS INFORMATION

Na me of District: _____
Interviewer name: _____
Gender: Number of Male ( ) Number Female ( )

General Background

1. Is your child enrolled in this school?
2. Does your child benefit from the NSFP?
3. What meals are given to learners through NSFP?
4. What do you think of the meals served? Probe on quality of meals and quantity.
5. What is your opinion on the preparation of food? Probe on Food handlers, pots, utensils, cooking equipment (firewood or gas), water and wastage.

Community Involvement

1. Are you involved in the school feeding programme?

2. How are you involved in the school feeding programme? If yes, at which stage of the process? What do you do?
3. Are other community members involved in the programme? How?
4. Are the cooks paid for preparing the food?
5. Do parents contribute to the school feeding programme? How and what do they contribute? (Could be money or in-kind contribution).

6. Is there a committee comprising representatives of parents, teachers, and learnerss which decides on the meals or influences the NSFP?

Perception on the impact of NSNP

1. As parents what difference is the school feeding programme making to your children?
2. What kind of difference has it made?

Food preparation

1. Who manages the programme at school?
2. Is the food prepared on premises? Where is it prepared and by whom?

Challenges and Recommendations

1. What, if any, are the challenges, in the programme?
2. How do you think they can be resolved?
3. How do you think the organization and management of the NSFP can be improved?

APPENDIX B: Ethics documents

APPENDIX – B1: Declaration by the participant

AN ASSESSMENT OF SCHOOL FEEDING PROGRAMME – PILOT FHASE AND ITS RELATIONSHIP WITH ENROLMENT, ATTENDANCE, RETENTION AND THE LOCAL AGRICULTURAL PRODUCTION IN NAMPULA PROVINCE IN MOZAMBIQUE

ETHICS COMMITTEE REFERENCE NUMBER 182/2016

DECLARATION BY PARTICIPANT

I, the undersigned ---------- hereby give my permission to take part in the study above mentioned research study. I am aware that the results of the study, including personal details, will be anonymously processed into research reports. I understand that I have agreed to take part in the study on a voluntary basis. I understand that I may withdraw from the study at any time without any consequences. I understand that I cannot hold the University of Pretoria for any inconvenience that I may experience because of the study.

Participant signature: .....…… Date.....

DECLARATION BY THE RESEARCHER

I, ---------- declare that I have explained the information about this study to the participant named above and I asked her to ask any question for clarification if something was not clear to him/her.

Signature---------- Date ----------

(Researcher)

Signature ---------- Date ----------

(Witness)

APPENDIX -B2: Information leaflet and assent for learners

AN ASSESSMENT OF SCHOOL FEEDING PROGRAMME – PILOT PHASE AND ITS RELATIONSHIP WITH ENROLMENT, ATTENDANCE, RETENTION AND THE LOCAL AGRICULTURAL PRODUCTION IN NAMPULA PROVINCE IN MOZAMBIQUE

ETHICS COMMITTEE REFERENCE NUMBER 182/2016

INFORMATION LEAFLET AND ASSENT FOR LEARNERS

We wish to know if you would like to volunteer to be part of a research study entitled "An assessment of school feeding programme - pilot phase and its relationship with enrolment, attendance, retention and the local agricultural production in Nampula province in Mozambique" in which you will be asked about the school feeding programme. We are asking you because you have been receiving some meals at this school. The study will help us to gather information on the school feeding programme.

Other children are going to take part in this study. We will ask you as learners to tell as on how the school meals are provided and what your thoughts are about the way in which they are provided.

If you do not want to take part or decide at any time during the interview, not to carry on no-one will force you to carry on. Your choice not to participate will not affect your receiving the school meals or schooling

If you sign at the bottom, it will mean that you have read this Ximaer, and that you would like to be in this study.

Written Consent

Signature: _____

Name of Person Obtaining Consent: _____ Date: _____

Verbal consent

I hereby certify that _____ consented to participating in the study.

Name of Person Obtaining Consent: _____ Date: _____

Witness: _____

APPENDIX -B3: Ethics approval

The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.
- FWA 00002567, Approved dd 22 May 2002 and Expires 20 Oct 2016.
- IRB 0000 2235 IORG0001762 Approved dd 22/04/2014 and Expires 22/04/2017.

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences Research Ethics Committee

26/05/2016

Approval Certificate
New Application

Ethics Reference No.: 182/2016

Title: An assessment of school feeding programme - pilot phase and its relationship with enrolment, attendance, retention and the local agricultural production in Nampula province in Mozambique

Dear Victor Sitao

The **New Application** as supported by documents specified in your cover letter dated 19/05/2016 for your research received on the 19/05/2016, was approved by the Faculty of Health Sciences Research Ethics Committee on its quorate meeting of 25/05/2016.

Please note the following about your ethics approval:
- Ethics Approval is valid for 4 years
- Please remember to use your protocol number (**182/2016**) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, or monitor the conduct of your research.

Ethics approval is subject to the following:
- The ethics approval is conditional on the receipt of **6 monthly written Progress Reports**, and
- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.

We wish you the best with your research.

Yours sincerely

Dr R Sommers; MBChB; MMed (Int); MPharMed,PhD
Deputy Chairperson of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria

The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health).

☎ 012 356 3085 fhsethics@up.ac.za http://www.up.ac.za/healthethics
✉ Private Bag X323, Arcadia, 0007 - Tswelopele Building Level 4-59, Gezina, Pretoria

APPENDIX – B4: Approval from Ministry of Education - Mozambique

REPÚBLICA DE MOÇAMBIQUE
MINISTÉRIO DA EDUCAÇÃO E DESENVOLVIMENTO HUMANO
DIRECÇÃO DE NUTRIÇÃO E SAÚDE ESCOLAR

AO
MINISTÉRIO DA SAÚDE
MAPUTO

Nota nº 07/ MINEDH/DNUSE/ /2016 de 18 de Janeiro de 2016

A S S U N T O: **Resposta Sobre o Pedido para Realização de Pesquisa**

Acusamos a recepção da nota nº 370/24.1/DRH/DF/16, de 14 de Janeiro de 2016, da Direcção Nacional de Recursos Humanos do Ministério da Saúde, que solicita a autorização para realização de pesquisa intitulada "Avaliação do Programa Nacional de Alimentação Escolar – Fase-piloto e sua relação com Indicadores Educacionais, estado antropométrico das crianças e com a produção agrícola local em Moçambique".

Considerando a importância do estudo para a conclusão do curso do senhor Victor Sitão e para a avaliação do impacto da alimentação escolar nos Indicadores Educacionais, a Direcção de Nutrição e Saúde Escolar do Ministério da Educação e Desenvolvimento Humano, autoriza a realização deste estudo nas escolas do piloto nomeadamente: EPC Muecate Sede, EPC de Muaualo, EPC de Iapala Sede e EPC de Niapala nos distritos de Nampula distrito, Muecate, Mossuril e Ribaué, respectivamente, na província de Nampula, desde que os resultados do estudo sejam compartilhados com o Ministério da Educação e Desenvolvimento Humano.

Cordiais Saudações.

A Directora Adjunta,

Graziela Tembe
(Docente N1)

JÁ/ja

Avenida 24 de Julho nº 167 – Telefone nº 21 492461 – Fax nº 21 492196 – C.P. 34 4º Andar – Maputo

APPENDIX – B5: Approval from Bioethical Committee - Ministry of Health

REPÚBLICA DE MOÇAMBIQUE

MINISTÉRIO DA SAÚDE
COMITÉ NACIONAL DE BIOÉTICA PARA A SAÚDE
IRB00002657

Exmo Senhor
Dr. Victor Sitão

Ref: 270/CNBS/16 **Data 15 de Agosto de 2016**

Assunto: Parecer do Comité Nacional de Bioética para Saúde (CNBS) sobre o estudo: "*An Assessment of school feeding programme – pilot phase relationship with enrolment, attendance, retention and the local agricultural production in Nampula*"

O Comité Nacional de Bioética para Saúde (CNBS) analisou as correcções efectuadas no protocolo intitulado: ***"An Assessment of school feeding programme – pilot phase relationship with enrolment, attendance, retention and the local agricultural production in Nampula"*** Registado no CNBS com o número 53/CNBS/2016, conforme os requisitos da Declaração de Helsínquia,

Não havendo nenhum inconveniente de ordem ética que impeça a realização do estudo, o CNBS dá a sua devida aprovação aos seguintes documentos:

- Protocolo de estudo
- Consentimento Informado
- Instrumento de recolha de dados

Todavia, o CNBS informa que:

1- A presente aprovação não substitui a autorização administrativa.
2- Não houve declaração de conflitos de interesse por nenhum dos membros do CNBS.
3- A aprovação terá a validade de um ano, terminando esta a 15 de Agosto de 2017. Os investigadores deverão submeter o pedido de renovação da aprovação um mês antes de terminar o prazo.
4- Recomenda-se aos investigadores que mantenham o CNBS informado do decurso do estudo.
5- A lista actualizada dos membros do CNBS esta disponível na secretaria do Comité.

Com as nossas mais cordiais saudações.

O Presidente

Dr. João Fernando Lima Schwalbach

ENDEREÇO:
MINISTÉRIO DA SAÚDE
C. POSTAL 264
Av. Eduardo Mondlane/Salvador Allende
MAPUTO – MOÇAMBIQUE

Telefones: 430814/427131(4)
Telex: 6-239 MISAU MO
FAX: 258 (1) 426547
258 (1) 33320

APPENDIX – C: Publications

APPENDIX – C1

Health Education Journal

Home

Author

Review

Submission Confirmation

Print

Thank you for your submission

Submitted to
Health Education Journal

Manuscript ID
HEJ-18-0096

Title
Learner enrollment and retention at schools implementing Mozambique National School Feeding Program

Authors
Sitao, Victor
McCrindle, Cheryl
Kiamba, Josephine
Wanjala, Kuto

Date Submitted
09-Mar-2018

Author Dashboard

APPENDIX – D: Tables regarding the study results

APPENDIX – D1

Table 8-1:Learners enrolment by grade and year in SFP schools in Nampula province between 2013 and 2015, (N= 24 770)

		Year	SFP==0	
Grade	2013	2014	2015	Total
Grade 1	1,423	1,655	1,504	4,582
(%)	31.06	36.12	32.82	
Grade 2	1,196	1,336	1,387	3,919
%	30.52	34.09	35.39	
Grade 3	1,009	1,198	1,355	3,562
%	28.33	33.63	38.04	
Grade 4	877	1,153	1,301	3,331
%	26.33	34.61	39.06	
Grade 5	794	1,029	1,230	3,053
%	26.01	33.7	40.29	
Grade 6	754	1,098	1,285	3,137
%	24.04	35	40.96	
Grade 7	624	1,245	1,317	3,186
%	19.59	39.08	41.34	
Total	6,677	8,714	9,379	24,770
%	26.96	35.18	37.86	

Table 8-2:Learners enrolment by grade and year in non-SFP schools

Grade	**2013**	**2014**	**2015**	**Total**
Grade 1 %	493	473	386	1,352
%	36.46	34.99	28.55	100
Grade 2	429	384	345	1,158
%	37.05	33.16	29.79	100
Grade 3	385	339	313	1,037
%	37.13	32.69	30.18	100
Grade 4	380	303	286	969
%	39.22	31.27	29.51	100
Grade 5	356	274	280	910
%	39.12	30.11	30.77	100
Grade 6	292	205	255	752
%	38.83	27.26	33.91	100
Grade7	590	399	409	1,398
%	42.2	28.54	29.26	100
Total	2,925	2,377	2,274	7,576
%	38.61	31.38	30.02	100

Table 8-3:Enrolment change comparison between NSFP schools and non-NSFP schools in Nampula from 2013 to 2015

SFP CODE		2013	2014	change, n	change (%)
SFP		6677	8714	2037	30,51
Non-SFP		2925	2377	-548	-18,74
Total		9602	11091	1489	15,51
SFP CODE	2013	2014	2015	change, n	change (%)
SFP		8714	9379	665	7,63
Non-SFP		2377	2274	-103	-4,33
Total		**11091**	**11653**	562	5,07

Table 8-4:Retention and drop out two-way association by grade between SFP and Non-SFP in 2014

Grade	School feeding Program		No-school Feeding Program		χ^2	Pr
	Retained	Drop out	Retained	Drop out		
Grade 1	1503	1	1504	47	181.983	<.001
Grade 2	1379	8	309	36	108.442	<.001
Grade 3	1350	5	284	29	107.776	<.001
Grade 4	1290	11	253	33	99.448	<.001
Grade 5	1213	17	254	26	51.498	<.001
Grade 6	1269	16	216	39	121.945	<.001
Grade 7	1287	30	369	40	45.139	<.001
Grade 1-7	9291	88	2024	250	657.094	<.001

Table 8-5:Trend of learner retention rates by grade in SFP schools

Grade	Year	SFP school retention/year		Total
	2013	2014	2015	
Grade 1 Enrolled	1,423	1,655	1,504	4,582
Grade 1 Retained	1,374	1,650	1,503	4,527
% retained	96.56%	99.70%	99.93%	98.80%
Grade 2 Enrolled	1,196	1,336	1,387	3,919
Grade 2 Retained	1,129	1,327	1,379	3,835
% retained	94.40%	99.33%	99.42%	97.86%
Grade 3 Enrolled	1,009	1,198	1,355	3,562
Grade 3 Retained	946	1,185	1,350	3,481
% retained	93.76%	98.91%	99.63%	97.73%
Grade 4 Enrolled	877	1,153	1,301	3,331
Grade 4 Retained	813	1,139	1,290	3,242
% retained	92.70%	98.79%	99.15%	97.33%
Grade 5 Enrolled	794	1,029	1,230	3,053
Grade 5 Retained	731	1,020	1,213	2,964
% retained	92.07%	99.13%	98.62%	97.08%
Grade 6 Enrolled	754	1,098	1,285	3,137
Grade 6 Retained	666	1,084	1,269	3,019
% retained	88.33%	98.72%	98.75%	96.24%
Grade 7 Enrolled	624	1,245	1,317	3,186
Grade 7 Retained	564	999	1,287	2,850
% retained	90.38%	80.24%	97.72%	89.45%
Total Enrolled	6,677	8,714	9,379	24,770
Total Retained	6,223	8,404	9,291	23,918
% retained	93.20%	96.44%	99.06%	96.56%

Table 8-6: Retention and drop out two-way association by grade between SFP and Non-SFP in 2013

Grade	School feeding Program		No-school Feeding Program		χ^2	Pr
	Retained	Drop out	Retained	Drop out		
Grade 1	1374	49	441	52	37.00	<.001
Grade 2	1129	67	393	103	4.139	.042
Grade 3	946	63	333	52	19.420	<.001
Grade 4	813	64	342	38	2.597	.107
Grade 5	731	63	306	50	10.358	.001
Grade 6	666	88	225	67	21.195	<.001
Grade 7	564	60	539	51	0.344	.557
Grade 1-7	6223	454	2136	241	67.370	<.001

Table 8-7: Retention and drop out two-way association by grade between SFP and Non-SFP in 2014

Grade	School feeding Program		No-school Feeding Program		χ^2	Pr
	Retained	Drop out	Retained	Drop out		
Grade 1	1650	5	434	39	114.621	<.001
Grade 2	1327	9	352	32	75.206	<.001
Grade 3	1185	13	309	30	58.772	<.001
Grade 4	1139	14	271	37	101.334	<.001
Grade 5	1020	9	237	37	104.228	<.001
Grade 6	1084	14	173	32	104.228	<.001
Grade 7	999	246	360	39	21.020	<.001
Grade1-7	8404	310	2136	241	171.338	<.001

Table 8-8: Retention and drop out two-way association by grade between SFP and Non-SFP in 2014

Grade	School feeding Program		No-school Feeding Program		χ^2	Pr
	Retained	Drop out	Retained	Drop out		
Grade 1	1503	1	1504	47	181.983	<.001
Grade 2	1379	8	309	36	108.442	<.001
Grade 3	1350	5	284	29	107.776	<.001
Grade 4	1290	11	253	33	99.448	<.001
Grade 5	1213	17	254	26	51.498	<.001
Grade 6	1269	16	216	39	121.945	<.001
Grade 7	1287	30	369	40	45.139	<.001
Grade 1-7	9291	88	2024	250	657.094	<.001

APPENDIX – E: NSFP pictures of cooking and serving arrangement

Appendix E1

NSFP pictures showing cooking and serving arrangement: