Food for Thought:

Investigating the Potential of a Locally Initiated Farming Based School Feeding Programme as Educational Intervention in Rural Tanzania

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International Development Studies

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Master Thesis

Action research project with stakeholders of the school feeding programme at Kibuko primary school, Mgeta, Tanzania

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Declaration

I, Linn Sissel Jaeckle, declare that this thesis is a result of my research investigations and findings. Sources of information other than my own have been acknowledged and a reference list has been appended. This work has not been previously submitted to any other university for award of any type of academic degree.

Signature:

Date:

To the Children of Mgeta

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Abstract

Low-income countries like Tanzania, are financially limited and cannot afford a nation wide school feeding programme. 75% of Tanzanian schools do not have a school feeding programme - innovative and cost-efficient approaches to school feeding programme that are thus needed. The research explores the potential of locally owned farming based school feeding programmes to act as an educational intervention.

In the framework of action research I studied a school that was running a school feeding programme, sourcing the food on its own farm and independently from any external government or NGO input. Action research and Freire's (2000) concept of dialectic discourse set the methodological and theoretical framework of the research approach.

The goal of this research was two fold: to better understand the potential of a farming based school feeding programme to decrease hunger, increase enrolment and improve education outcomes, and to collaborate with stakeholders of the case study to identify actions that could further improve the school feeding programme. Through participatory action research with stakeholders we derived possible actions to manage and improve identified and agreed-on deficits. This process showed two things: 1) The potential of action research as a mediating and enabling tool for critical consciousness through offering a platform of mediated dialogue. 2) The potential capacity of stakeholders of the Kibuko programme to influence their environment.

The evidence of the research suggests that in-house farming based school feeding programmes have potential to improve children's educational situation. The beneficial impact on education has been traced back to the provision of food through the school feeding programme. Analysis strongly suggests that educational improvement cannot solely be attributed to the provision of food at school. The sourcing method of the food – the school farm - contributed to the children's improved educational performance as well. The duel holistic impact of the school feeding programme and school farming changed learning conditions at school and thus enabled an improvement in the learning outcome.

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Abbreviations

FANRPAN	Food Agriculture and Natural Resource Policy Analysis Network.
FAO	Food and Agriculture Organization of the United Nations
EFA	Education For All
EPINAV	Enhancing Pro-poor innovations in Natural Resources and Agricultural Value-chains
GEMR	Global Education Monitoring Report
HRW	Human Rights Watch
MoEVT	Ministry of Education and Vocational Training (United Republic of Tanzania)
NBS	National Bureau of Statistic (United Republic of Tanzania)
NECTA	The National Examinations Council of Tanzania
NGO	Non-Governmental Organisation
NMBU	Norwegian University of Live Science
NORAD	Norwegian Agency for Development Cooperation
PSLE	Primary School Leaving Exam
SFP	School Feeding Programme
SUA	Sokoine University of Agriculture
TEN/MET	Tanzania Education Network/Mtandao wa Elimu Tanzania
TFNC	Tanzania Nutrition and Food Centre
UN	United Nations
UNESCO	United Nations Education
UNMADEP	Uluguru Mountains Agricultural Development Project
URT	United Republic of Tanzania
WB	World Bank
WFP	World Food Programme
WHO	World Health Organisation

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1 Introduction

"When I eat it is easier to go to class. It is easier to follow the class - I remember more from class afterwards. When I don't eat I cannot listen to the teacher, because I am thinking about food at home", (Student, interviewed 12.04.14).

Hunger is a serious challenge in the developing world. People living in rural areas in developing countries and working in agriculture, to a large degree small-scale farmers, are the most food insecure and thus often exposed to its consequences. Hunger creates a physical and mental barrier between child and learning. Not only a child's health is impacted by hunger, but also a child's education (Powell et al., 1998). High drop out rates from schools and low education levels are a problem for many developing countries and closely linked to food insecurity. Children do not enlist at school, because they are needed at home to contribute to the households' food security; they stay absent from school or leave school, because they are looking for food; they are too hungry to stay awake or concentrate (Bundy et al., 2012). An elimination or decrease of the physical and mental hunger barrier between children and their education can potentially improve their education situation.

Education is key for individual personal development and a country's development. Numeracy skills and literacy enable and increase an individual's economic productivity and as such contribute to a country's economic growth and social development. "Education not only facilitates individuals' escape from poverty, but also generates productivity that fuels economic growth. A one-year increase in the average educational attainment of a country's population increases annual per capita GDP growth from 2% to 2.5%" (GMER, UNESCO, 2014, p.14). Accordingly, promotion of development through education is an integral part of a country's development strategy. For instance, education is emphasized in the Norwegian "White paper no 25, 'Education for development'," as a prerequisite for development (Norwegian Ministry of Foreign Affairs, 2014). The global policy mandate for 'Education for All' is the international community's response and has been in place since 1990. It aims to not only increase school enrolment and improve education quality worldwide, but enable all children to access quality education (UNESCO, 2000). Enrolment and access to education has indeed increased significantly.

However, the quality of education has often not improved equivalently. Additional years of schooling do not necessarily bring a lot of economic growth, due to poor learning (Hanushek and Wößmann, 2007, Evans and Popova, 2015). Thus, school enrolment does not equal education. As described above, hunger is a factor that can come between children and their education, even when education would per se be available. "Hungry people cannot take advantage of opportunities, such as training, clinics, education or credit. This becomes a stumbling block to a better life" (WHO and WFP, 1997, p.16).

School feeding programmes (SFPs) respond to this hunger issue at school and aim at increasing a child's ability to take advantage of the opportunity of education by eliminating or decreasing hunger. SFPs have shown to be beneficial for educational outcomes. SFPs can increase enrolment rates, decrease absenteeism, improve educational performance, increase food security and improve health (Bundy et al., 2012). SFPs can have the objective of improving the educational situation of children, or their health, or both. This thesis focuses on the potential educational benefits of SFPs.[1] The international community acknowledges hunger as a barrier to education (UNESCO, 2000) and SFPs as a good approach to answering this problem. SFPs have a long history of successful implementation and outcomes, and are still very popular (Bundy et al., 2012).

One challenge regarding SFPs is that their implementation is not affordable for developing countries (Bundy et al., 2009) where the children most in need of SFPs are living. There are different types of SFPs, which follow different kinds of financial structures. I am making an overall distinction between out-of-house and in-house SFPs based on the monetary source of the programme. Out-of-house SFP refers to a SFP, which is financed and implemented by an external donor and agency. With 'external' I refer to external of the school or the school's community. The external agency may be a national, international, governmental or non-governmental agency. In-house SFP indicates a SFP, which is organised locally and funded by the school or the community. Either the school or the community produces the food, or the school or the community purchases the food. The SFP is organised and implemented by the school or the community without external assistance. In-house SFP is a promising approach. It does not rely on external funding for producing and serving food and thus

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[1] School feeding programme (SFP) hereafter referred to as SFP, respectively SFPs.

could potentially offer an alternative for primary schools located in poverty and hunger-stricken areas outside of the target area of external agencies.

There are long-lasting traditions of farming at school, both in USA and Europe, but also in Tanzania and in other development countries (Phillips and Robert, 2011). In developing countries, farming at school has either been a part of the formal framework of institutionalised national or international development policies or simply part of the informal framework of a school. Experiences have shown that the harvest produced in the framework of a school farm (both formal and informal frameworks) often does not suffice to feed all students (Phillips and Robert, 2011, FAO, 2014). In addition, farming activities may impede efficient classroom learning. Furthermore, farming on school grounds in developing countries can be *exploitative,* when teachers misuse school children as a labour force and use the harvest for their personal consumption and purpose (Phillips and Robert, 2011). However, school farms are also associated with many benefits. Farming activities at school can provide an active learning ground for school subjects such as mathematics, biology, reading and writing. It increases enrolment and school presence because it makes school more attractive for children and their parents by teaching things that are relevant for rural life (FAO, 2014). Last but not least, the food produced might not be enough to feed all the children sufficiently, but it can certainly improve the hunger situation by increasing the amount of food available for consumption.

Tanzania suffers from widespread food insecurity, poverty, and low education outcomes, and cannot afford a national SFP. Over 75% of primary schools in Tanzania do not have a SFP (TFNC, 2004). 43 % of the Tanzanian population consume insufficient amounts of food to meet their dietary energy requirements, 29% are considered to be highly food energy deficient (WFP and WB, 2012). Looking at the population between the age of 15 and 49 of 2010 only half has completed primary school (NBS and ICF Macro, 2011). Drop-out rates at primary schools continue to be high and rural education outcomes are low. 23 % of the children between the age of 7 and 13 who are supposed to attend primary school, do not (URT, 2015). Of those who do attend primary school, 50% fail the graduation exam of primary school and consequently cannot attend secondary school (HRW, 2014). Measures which will keep children in the education sector and improve the effectiveness of their education and consequently their future opportunities, are needed. Especially considering the fact that 44% of Tanzania's population is under 15 years old (URT, 2015).

In-house SFPs-are interesting in Tanzania, because they offer an alternative to relying on or waiting for a national school feeding strategy. Both SFPs and school farming are associated with benefits for the educational experience and outcome for children, which are needed in Tanzania. Additionally, the practice of farming on school grounds harmonises greatly with historical, cultural and economic Tanzanian precedent. During the rule of the Nyerere government, all primary schools in Tanzania had school farms. Today around 80% of Tanzanians are small-scale farmers and most of the children will become small-scale farmers (WB, 2013). This leads me to pose the following research question: '*What potential do farming based school feeding programmes have for decreasing hunger, increasing school attendance, and improving school performance?*'

To answer this question I will study a school that runs a locally developed farming based SFP. In the framework of action research I discuss the degree to which the programme fulfils the defined potential with the research community, and then through participatory action research with the stakeholders, we derive possible actions to manage and improve identified and agreed upon deficits. The objective is to improve the education situation of the children in the research community through motivating the stakeholder to define the problem and the solution to it.

The involvement and ownership of the ideas of the stakeholder are crucial to both the research objective and to me as a researcher. Firstly, I understand theory and practice as connected to each other and forming each other through people engaging in dialectical discourse (Freire, 2000). Secondly, I left the field after a few months, so the stakeholder's ownership of the idea and action is critical for the action research to have a sustainable effect (Piggot-Irvine, 2012). Thirdly, I am interested in understanding the potential of a locally developed idea. And last but not least, my aim is to build a mutually beneficial relationship with the stakeholders.

The primary school in Kibuko village, located extremely rurally in the Uluguru Mountains in Tanzania, developed its own in-house SFP and serves as case study. According to preliminary research, which was a one-day semi-structured interview with the headmaster (2013), this primary school is sourcing the food for its SFP from its own school farm and has enough harvest stored to cook three meals a week for a year. (I will henceforth refer to this particular in-house farming based SFP as the Kibuko programme.)

The data collection in the field was organised around three questions, which answers provided me with the necessary data to answer the overall research question.

Question 1:   *How does the Kibuko programme work?*

Question 2:   *How does the Kibuko programme impact the children's education?*

Question 3:   *How can the education of Kibuko primary school children be improved?*

Overall research question: *"What potential do farming based school feeding programmes have for decreasing hunger, increasing school attendance, and improving school performance?"*

I will start with an introduction to Tanzania and present Tanzanian education situation and the Tanzania relation to SFPs in chapter 2. This in order to create a better understanding of the situation and challenges one can expect to find at primary schools in rural Tanzania. The thesis will then start zooming in on the case study area, by focusing on the conditions and challenges defining Mgeta area and the village of Kibuko. In Chapter 3 I will look at how hunger relates to education, and why hunger is a problem at school, what measures exist to respond to this problem. Chapter 2 and 3 build foundation where the research question navigating this research originates. The following chapter explains the research strategy chosen to answer these questions. Chapter 4 presents the rationality behind choosing action research as a methodology, discusses methodological decisions, presents the research strategy and outlines the planned research steps. The executed research steps and findings will be presented and analysed in three parts:

Finding Part I chapter 5 Story of the research,

Findings Part II chapter 6 Findings and analysis,

and Findings Part III chapter 7 Discussion and commentary.

Part I tells the story of the research, and provides some insight on main events and my methodology. Part II concentrates on answering the concrete questions regarding the organisation of Kibuko programme, educational impacts of the Kibuko programme, and Improvement strategies of Kibuko programme. Part I and II create the basis for Part III's discussion and commentary, where I answer and discuss the overall research question of the potential a farming based SFP has for decreasing

hunger, increasing school attendance and improving school performance. Part III Discussion and commentary will open up the discussion and include some comments on the programme's challenges and sustainability. I will the make some brief comments on methodology in Chapter 8, before I close with some concluding remarks on the on the main findings of this research and where they point to in the future.

2 Background Tanzania

43% of the 45 million people living in Tanzania (in 2012) consume insufficient amounts of food to meet their dietary energy requirements. This includes people suffering severe to moderate food insecurity. 29% of Tanzanians are considered to be highly food energy deficient (WFP and WB, 2012). There is an extreme disparity between rural and urban Tanzania in regard to food insecurity and poverty. The percentage of people living in extreme poverty earning too little to meet their basic food needs is five times higher in rural areas than in urban areas (Ecker et al., 2011). In 2007 around 37% of the rural population lived below the national poverty line (WFP and WB, 2012). Small-scale farmers who depend on their own produce are typically poor and food insecure. Poorly educated households are more likely to be food insecure. (WFP and WB, 2012). 70% of the Tanzanian population live in rural areas (WFP and WB, 2012) and around 80% are employed in farming (WB, 2013).[2]

Tanzania is spreads over 947'300 square km and 30 administrative regions that all face different socio-economic and geographical conditions. The climate varies from topical along coast to temperate in highlands (CIA, 2016).

2.1 Tanzanian education situation

In Tanzania, school enrollment is mandatory and all children between the age of 7 and 15 are supposed to be enrolled in primary or secondary school.[3] 44% of the Tanzanian population is under 15 and thus falls into this category. In 2001 the government eliminated the school fees and school enrolment spiked to 95%. By 2014, only 75 % of the children between the age of 7 and 13 years who were supposed to attend primary school were enrolled (URT, 2015). Girls are under-represented (HRW, 2014). Despite school being mandatory and free in theory, in practice there are school fee contributions and an additional expense for uniforms, books and the like. Due to poverty and food insecurity, many parents cannot afford these additional expenses and the children are needed at home to contribute to the household income.

To enter public secondary school, a primary school child needs to pass the Primary School Leaving Exam (PSLE) at the end of Standard 7. (Standard is

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[2] All numbers, if not indicated otherwise refer to 2012.
[3] Primary school is divided in 7 years, named Standard1 till 7. Secondary school is divided in 4 years, names form 1, 2, 3 and 4. After form 4 one can apply for university

Tanzanian term for level of education). The Standard 7 exams can only be attended once, and only if the student passes it is he or she allowed to proceed to secondary school. Each year, hundreds of thousands of children fail this exam, cannot advance to secondary school, and hence drop out of school. [4] In 2013 more than 400'000 children (49 %) failed the PSLE (HRW, 2014). The fact that around 50% of children are failing the exam means that they leave school too early. The quality of the education sector is put into question when only every second child is capable of passing the exam. A third of all children enroll in secondary school and only four per cent continue with higher education (WB, 2014).

The teaching conditions are difficult: schools lack basic infrastructure, from classrooms to school books, the average student teacher ratio is 43:1 (WB, 2014). Furthermore, between 50-75% of children can be expected to arrive hungry at school in the morning and more than 75% of primary schools in Tanzania do not have a SFP (TFNC, 2004). Thus, the majority of the class is hungry in the first hour of teaching, which creates unproductive teaching and learning conditions. This sheds light on a general food insecurity and the resulting health issues of Tanzanian youth. In relation to the education sector, the Tanzania Food and Nutrition Centre (TFNC) observes that short-term hunger results in a lack of attention and concentration at school (2004). Part of the high numbers of absenteeism and dropouts is a result of hunger leading children to leave school in order to organise food or earn money to buy food (TFNC, 2004). Poverty, household insecurity, poor awareness among authorities of the importance of nutrition for school children, and the low priority of school feeding versus other educational requirements are listed as reasons for low status of school food by the TFNC (2004). However, SFPs are very expensive. The cost of a national SFP might exceed the cost of national education. In low-income countries such as Tanzania, SFPs generally rely on 83% external donor support (Bundy et al., 2009).

2.2 History of school feeding programmes in Tanzania

This section gives an account of the history and evolution of SFPs and farming in Tanzanian primary schools. The purpose is both to expand the understanding of the Tanzanian education sector and to shed light on the role of farming in Tanzania throughout the Nyerere era. If parents and teachers had farmed and received school

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[4] In 2015 Tanzania announced to abolish the PLSE.

meals when they attended school, their experiences might influence how they understand the situation of their children at school today.

The British Empire (1919-1949) introduced the first national institutionalised school feeding strategy in Tanzania.[5] The British Empire used the harvest from school farms for both school feeding and generating incomes to run the school. Their objectives were to cover the costs of SFPs, to increase Tanzanian productivity, and to increase the profit of their colony by minimising their colonial expenses in Tanzania as much as possible (Phillips and Robert, 2011).

After Tanzania gained independence in the 1960's, their new president, Julius Nyerere, continued but also transformed the concept of school farming under the education policy, "Education of Self-reliance". One overall objective of the school farms was to support and promote development of self-reliance; at school, in society, and also among pupils and society members in general. The Education of Self-reliance transcended the framework of school and was supposed to teach the children life skills and create a positive attitude towards agriculture in order for them to be self-reliant for the rest of their lives. The agricultural activities and other life skills were integrated into the national curriculum (Phillips and Robert, 2011, FANRPAN, 2012, Msuya et al., 2014).

With a shift of government in the 1990's, the education policy changed as well. School farming or agriculture was no longer part of the education plan. According to teachers interviewed in my research, the government introduced a school feeding policy, which states that each primary school has to provide food for its students. The teachers themselves heard about this, but none of them had experienced it themselves and I could not find any government document or literature confirming such a policy.

What I could find were plans from the WFP and Tanzanian Ministry of Education and Vocation Training (MoEVT) to develop a national school feeding strategy and school feeding policy. Numbers mentioned earlier, that 75% of primary schools do not have a SFP (TFNC, 2004), show the hitherto limit of the realisation of this policy.

Nonetheless, in some especially hunger prone areas such as Singida, Shinganga and Manyara, the MoEVT of Tanzania, in collaboration with the WFP,

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[5] At that time called Tanganyika, which is the mainland of Tanzania today.

already provides schools with food. This is an initiative that originates in the WFP Food for Education Programme (FFE). Around 1167 primary schools and 700 000 children are benefiting from this SFP initiative and have been receiving two warm meals per day for all 195 school days each year since 2010 (WFP, 2011). Then, Tanzania is the beneficiary of various SFPs implemented through foreign governments, IGOs and NGOs. This means the majority of SFPs in place today are either implemented by or with the help of an international donor.

In summery, Tanzania is not able to afford a nation wide SFP, donor funded SFP are not a sustainable long-term solution and Tanzania has a history of using school farming as feeding strategy and generating in come for the school. Considering these points, a school feeding strategy that is independent from external financing and relying on school farming as source of food is an interesting alternative. Therefore I have chosen to investigate an in-house SFP in a local community in the Uluguru Mountains in Tanzania. The following sub-chapter provides some details on research community.

2.3 Case study

Kibuko primary school is located at the periphery of the periphery in the rural highland of Tanzania, in Morogoro region. Kibuko village lies in Nyandira Wad, in Mgeta division, on the west side of the Uluguru Mountains, ranging from 1100 to 1750 meters above sea level. Figure 1 shows the whole Uluguru Mountain Range and Figure 2 shows a close up of the Nyandira Wad.[6]

Figure 4. Uluguru Mountains, Tanzania. Photograph of map at Sokoine University of Agriculture, Morogoro. Photograph taken April 2014.

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[6] The map is a photograph of a map created by SUA for research purposes.
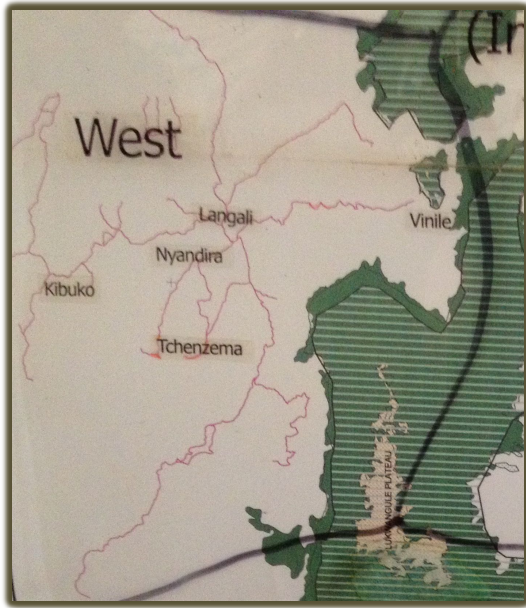
Figure 5. Uluguru Mountains, Tanzania. Photograph of map at Sokoine University of Agriculture, Morogoro. Photograph taken April 2014.

Nyandira village is the last village in Mgeta that is connected to the "rest" of Tanzania by asphaltic road and public transports, and therefore an important geographical orientation point for Kibuko village. During the rainy seasons there are several periods where public transports cannot drive up the steep mountain road leading up to Nyandira and Nyandira Wad is isolated. There is a dirt road, which winds its way over the ridge of the Uluguru Mountains starting in Nyandira village and heading further south into the Mountains, passing by different villages including Kibuko village. The village centre of Kibuko is located on a hill, which cannot be reached by this "main mountain ridge road". There is no car road leading from the village centre to the Kibuko primary school.

Kibuko village does have a village centre with a higher accumulation of houses, however, many houses and the school are located a couple of kilometres away from the school. Most people are small-scale farmers and live with in their house next to their field. The village centre, the school and the people's houses and farms are scattered over several hills and valleys. The villagers' means of transport is exclusively walking. They walk cross-country over the little dirt roads leading from one hill to another. The children and teachers have to walk up to an hour to reach school. From the primary school to Nyandira village it takes 1 or 2 hours of walking, it depends strongly on the weather and road condition. Kibuko primary is located around 4 km from Nyandira village on this dirt road, and Nyandira is about 40km from Morogoro, which is the nearest city.

In terms of water, the villagers either collect rainwater in buckets or fetch water from little ponds. The access and availability of water is good, however the water is not drinking water quality (UMADEP, 2001). The infrastructure in Kibuko is extremely poor: there is no proper road, consequently no public transport, no electricity and no working phone network. There is no electricity in Nyandira village either, but they have many generators and a well working phone network. Nyandira is

extremely important for Kibuko because it is their access to services like shops, charging their phones, public transports and, through the public transports, access to hospitals or the wider Tanzania.

The population of Kibuko and the wider regions are mainly small-scale farmers. Around 84% of the Mgeta population is engaged in agriculture and animal husbandry. Arable land is cultivated and there is little opportunity for expansion (UMADEP, 2001, Lie, 2011). Figure 3 and 4 show Kibuko village during the rainy seasons, they illustrate the steep terrains marking Kibuko village and Mgeta. The steep terrain is prone to soil avalanches in the rainy season and whole parts of the terrace farmlands or the terrain where houses, sheds or roads are built, break down and slide down the hill.

Figure 6. View from Kibuko village. Photograph taken May 2014, Photographer: L. S. Jaeckle.

Figure 4. View from Kibuko village. Photograph taken May 2014, Photographer: L. S. Jaeckle.

The geographical location defines the community of Kibuko greatly. There are hardly any employment possibilities in Kibuko villages, thus people rely heavily on agriculture and selling their harvest. Twice a week there is a market in Nyandira where the farmers sell their harvest. The transportation difficulties and costs are high so that they often do not earn anything when they sell their harvest.

Poverty and food insecurity characterise the area. Poverty and food insecurity transcend private household and equally characterise the schools in Mgeta region and Kibuko village. This financial restriction and hunger situation affects children's educational experience negatively. How exactly hunger and education relate will be covered in the following chapter.

3 Conceptual framework "A hungry child cannot learn"

Education is essential to the individual personal development and creates the basis for a person's economic productivity, which again is key for a country's social and economic development. This has been recognised by the international community and the responding measures have increased school enrolment significantly in developing countries. School enrolment alone does not guarantee education though. Hunger can prevent learning.

SFPs are measures set in place to decrease or alleviate the impact hunger has on children's education. But SFPs are expensive and developing countries can often not afford such programmes. This is where the in-house SFPs come into play. They are locally developed and organised without external funding, or despite the absence of external funding. One example of an in-house SFP is one that sourced its food ~~on~~ from its own school farm. Through this thesis I want to see what the potential is of such locally developed, in-house, farming based SFPs to increase school enrolment, decrease hunger, and improve education outcomes. This chapter will take a closer look at all the concepts underlying this question. First I need to understand the problematic relation of hunger and education. Secondly, I will look more closely at current responses to the problem of SFPs. Last but not least I will look at one specific SFP that sources the food on its own school farm.

3.1 The problem with hunger at school

Not only a child's health is impacted by hunger, but also its education. Malnourished children show behavioral disturbances, which interfere with their learning ability. Malnourishment refers to both moderately undernourished children or hungry children (Amcoff, 1980a). Already in 1980, the negative impact of hunger on a child's learning ability was established. In a paper advising UNICED and WFP in their Assistance to Education Amcoff (1980a) refers to research by Read and Liggo summing up that the behaviour disturbances shown by children, whether hungry or moderately undernourished, are listlessness, apathy, and a lack of interest in their environment (Read 1973). Furthermore, they show restless behaviour and a reduced ability to pay attention (Liggo, 1969).

"These behavioural disturbances most certainly interfere with learning. In order to learn and perform well at school the student must be active, attentive, curious, and explorative. He must also be able to focus on tasks and cope properly with social situations. These demands are poorly met by malnourished children", (Amcoff, 1980a, pp. 3-4).

30 years later these findings are still up-to-date and, unfortunately, hunger is still negatively impacting children's education. Chronically malnourished children often suffer irreversible health effects. In regard to learning barriers at school, both children suffering from chronic malnutrition and children suffering from short-term hunger are heavily affected. Children who come to school hungry, or are chronically malnourished, have diminished cognitive abilities that lead to reduced school performance", (FAO, 2014, p.3).

SFPs show that an increase of food at school increases school attendance and enrolment (WFP, 2013). Children stay away from school because their families need them to help produce food, or they decide independently to stay away because they use the school hours to look for ways to get food. When there is food at school the parents support children going to school because it is one less hungry mouth to worry about at home and the children themselves are motivated to be at school because they are getting food there (WFP, 2013).

In summary, hunger creates a physical and mental barrier between children and learning. Hunger leads to decreased academic performance, because it decreases children's physical and mental learning ability and keeps children physically away from school. Implementations of SFPs are known to decreases some of the above mentioned hunger issues, decrease absenteeism, and improve children's behaviour and educational performance (WFP, 2013).

3.2 School feeding programmes

In this thesis, a school feeding programme (SFP) is referred to as provision of food to children at school. I use this simple definition because it narrows it down to the main activity of SFPs to provide children at school with food and leaves open where the food originates, what kind of food is being served, who prepares the food, how frequent the food is distributed and which agency implements the school feeding and to which objective. SFPs vary, but they all provide food at school to children. SFPs are implemented to target health and education issues.

SFPs are implemented all over the world, almost every country has SFPs. Each day around 368 million children receive food at school through a SFP. SFPs

have the highest coverage in rich and middle-income countries, which can attribute to the fact that if a country can afford to provide food for its school children, it will (Bundy et al., 2009). The cost of SFPs in developing countries is much higher than in developed countries; in Ireland the cost of SFPs is 10% of annual capita cost for primary education versus 50% in Zambia (Bundy et al., 2009). Often the SFP is more expensive than the education (Bundy et al., 2009) and developing countries already struggle with offering free education. A challenge and reason for why a SFP is not set in place in a country or school is thus not because it is not wanted, but because the country or school cannot afford it.

A country does not pose the question of whether or not SFPs should be implemented, but struggles with the question of how (Bundy et al., 2009). The relevant question regarding SFPs is how SFPs can be designed in a cost-effective and sustainable way, so that the ones most in need can benefit from them (Bundy et al., 2009). Bundy concludes that "[t]he key issue today is not whether countries will implement school feeding programs, but how and with what objective", (Bundy et al., 2009, p.xvi).

3.2.1 Different agents - different possibilities – different SFPs

How and to what objective a SFP is implemented, is strongly connected to who is implementing the SFP. SFPs can be NGO-driven, government driven or locally driven. These three groups of agents all have access to different possibilities, budgets, infrastructures and objectives. The nature of the implementing agency, the objective, and design of the SFP are closely interlinked. The availability or the non-availability of a budget will influence and decide the possibilities of design.

Internationally funded and implemented SFPs, for example by the FAO or WHO, usually have access a large budget and infrastructure and information that can all be used to design and implement an effective SFP targeting specific predesigned issues. A SFP with the health objective of reducing iron deficiency in a village, region, or country, can supplement the SFP with fortified biscuits and as such target a health issue directly and efficiently. The SFP can even offer the children take home biscuits for their siblings and in this way target a whole village. SFPs working with take home food packages can increase the amount of girls or especially vulnerable children enrolled in schools, by giving the parents an incentive (the take home ration) to send their girls or children to school (Bundy et al., 2009, WFP, 2013). The list continues,

however it only continues for the areas targeted by a funded SFP. Despite having access to a large budget, international agencies cannot provide SFPs for whole countries.

Government funded and implemented SFPs are desirable and the agencies behind them often try to collaborate with the beneficiary government in order for the SFP to eventually be nationalised. Community based SFPs are an example where international agencies (having access to more funding and organisation skills) collaborate with the governments. The international agency manages and provides the food and the community is responsible for daily implementation. These are financed and organised by the international actor/donor (Andrews et al., 2011, Bundy et al., 2009).

Low-income countries cannot afford SFPs. The SFPs which are implemented in low income countries are financed up to 83% by donor investments (WFP, 2013). Locally funded and organised SFPs are the only solution left for schools, which are not targeted by out-of-house SFP agents. With locally organised SFP I refer to SFPs which are organised and financed by a school, which means it is financed privately by the parents of the children going to school. In-house SFP comprises a SFP where food is produced at or purchased by the school and organised by the school itself.

There is not much literature on what in-house SFPs do. There is a lot on how to implement SFPs and their benefits, but it is all focused on programmes that have some sort of external funding and assistance. I am curious about how a school that is not targeted by an international or government organised SFP deals with the hunger situation at the school. How does such a school organise a SFP. Schools, which cultivate food at the schoolyard and prepare school meals from that produce, are common in developing countries. The purpose of such school farms in developing countries varies between food production and using the farming activities for vocational training. School farms in developing countries are often the result of community led initiatives or the results of a devoted teacher (FAO, 2014). They are however also often initiated, implemented or supported by external agents. I focus on school cultivation that is initiated locally, without external input, and using its harvest for a SFP. In other words, a school farm based SFP. The budget here is whatever school parents can contribute and whatever the school itself can produce, in terms of both food and money. In-house SFPs are an interesting concept. They do not rely on external funding for producing or serving food. This also means that their possibilities

can be very limited. In-house SFPs either have to generate their own income through an economically profitable activity or they have to produce their own food through farming.

3.2.2 School feeding programme objectives and benefits

SFPs have been associated with various benefits; the benefits depend on the underlying objective and means available of the SFP implemented. A SFP can improve both health and education. In-house SFPs do not have the objective or the means to target specific health deficiencies, like iron deficiency or worms. Even though the in-house SFPs cannot target specific health issues–the programs can provide food and increase food consumption at school. I concentrate on SFP benefits emerging due to an increase in food consumption at the school.

SFPs have been shown to decrease absenteeism of children and increase the number of children enlisted in school. SFPs increase not only the amount of children that are enrolled in school, but also the amount that complete school (WFP, 2013). The percentage of girls enrolled in school has been shown to increase with the implementation of a SFP, due to the incentive it creates. Parents send the girls to school because they are being fed there and thus do not need to stay home and work for the food (Bundy et al., 2009, WFP, 2013). SFPs improve cognitive behaviours of children, increase attention span and facilitate learning (Bundy et al., 2009). In summary, school feeding can alleviate short-term hunger, increase school participation, increase children's ability to concentrate, learn, and perform specific tasks. An important aspect is that these effects are not limited to children who suffer chronic under-nutrition. The degree of benefits is higher for children who are undernourished, but for children who are "only" suffering from short-term hunger, SFPs can be expected to have the same benefits (Bundy et al., 2009).

Results from a study, "Effects of missing breakfast on the cognitive functions of school children of differing nutritional status," showed that undernourished children who would normally not consume breakfast, performed better after receiving breakfast during the study (Powell et al., 1998). Their school achievement, school attendance, and nutritional status improved, however, the study also concluded that these benefits are small. Moreover, children might suffer from larger health and nutritional problems, which cannot be fought by a simple breakfast, and schools often lack basic teaching facilities and material, which also affects children's learning

ability (Powell et al., 1998). A further study on breakfast in Jamaica confirmed that breakfast benefited children's classroom behaviours, however, only if they attended well organised and equipped classrooms (Chang et al, 1996). Many factors play together. Even when food security is increased and cognitive functions are improved, children will not necessarily score better in test results when the syllabus is taught poorly (Evans and Popova, 2015). For children to benefit from education, interventions need to take a holistic approach and ingrate health, nutrition and educational impact (Powell et al., 1998, WFP, 2013)

These benefits cannot simply be associated with every SFP. SFPs vary in the objective and the model of implementation, thus their impacts vary as well. The benefits associated with SFPs in general will serve as a guiding conceptual framework for the discussion and analysis of the impact the serving of meals in the Kibuko programmes has had. Kibuko programme is sourcing its food from its own school farm; therefore I will also look at literature on school farming.

3.3 School farming

School farming refers to cultivated areas at or near the school which are managed by the children and the teachers. They can include both agricultural activities and animal husbandry. School farms have a long tradition in the North and the South; they have existed since shortly after the first school was established. (Phillips and Robert, 2011).

School farming, school gardening, and school cultivation are all terms used to refer to cultivation activities on the school ground. The term farming reflects the actual production of goods for selling, trading, and consumption on a larger scale, whereas gardening is generally understood as an activity of pleasure and for personal consumption (Phillips and Robert, 2011). Difference in choice of terminology in school cultivation practices highlights the difference in the objectives behind the cultivation activities (Phillips and Robert, 2011). I am focusing on in-house, farming-based, SFPs. The cultivation practice on such a school has the objective of food production for an entire school, thus I will refer to this cultivation as farming.

Cultivation activities on school grounds can range from a little vegetable garden that is used for teaching nutrition and science, to a farm over several hectares that is focusing on crops production for feeding purposes. In a "vegetable garden" the

idea behind the children's involvement is educational, whereas the idea behind children's involvement in "crop production" is food security. The first one is usually implemented as part of the education plan and organised formally, whereas the second one is likely to be organised more loosely by the school itself without connection to the education sector. Then there are many in-between solutions, where educational purposes are mixed with food security and health purposes. The farming activity is integrated into the curriculum for learning purposes and the harvest of the farming is used as supplement for the SFP. This necessitates though that there is a running SFP already in place. In a sub-Saharan African context of poverty and food insecurity, like in rural Tanzania, farming activities on school grounds are mainly focused on producing food, with a possible but secondary emphasis on other things like agricultural education (Phillips and Robert, 2011).

Historically, in the North, cultivation on school grounds is primarily used for educational purposes, providing a practical learning ground for math, science, language or to teach children about nutrition. In the South, cultivation on school grounds is developed for the purpose of producing food for the school itself and to provide a practical learning ground for vocational training in agriculture skills (FAO, 2010, Phillips and Robert, 2011).

As mentioned in the introduction, school farms in developing countries are not actually able to produce enough food to feed the whole school (Phillips and Robert, 2011). Such challenges have created a new focus for the school farming sector.

> As a result, specialists in this field share the opinion that the new challenge for school gardens is to help students learn about food production, nutrition and environment education and personal and social development related with basic academic skills (reading, writing, arithmetic) while generating some food production to supplement SFPs ", (FAO, 2010, p.4).

Currently, school farms in developing countries are still majorly used for food production or as learning grounds for vocational training in agricultural skills (FAO, 2014).

A stronger shift from food production towards not only vocational skill training, but also concrete integration of farming activities in the curriculum, and instruction in sustainable farming methods, nutrition, and the environment connected to farming, are what experts and practitioners recommend and foresee (FAO, 2010, Phillips and Robert, 2011, FAO, 2014). FAO (2014) highlights the potential school gardens have as teaching method for improving children's nutrition and education

through teaching children on nutrition and the environment and teaching students agricultural techniques of sustainable food production. See below a table presented in this concept note, summarising all the functions FAO attributes to school gardens based on 30 years of school garden programme implementation experience. The function of school farming programmes are divided into "educational aims" and "economic and food security aims".

Table 3

Major aims of School Garden Programmes

Educational aims	• increasing the relevance and quality of education for rural and urban children by introducing into the curricula important life skills
	• teaching students how to establish and maintain home gardens and encourage the production and consumption of micronutrient-rich fruits and green leafy vegetables
	• providing active learning by linking gardens with other subjects, such as mathematics, biology, reading and writing
	• contributing to increasing access to education by attracting children and their families to a school that addresses topics relevant to their lives
	• improving children's attitudes towards agriculture and rural life
	• teaching environmental issues, including how to grow safe food without using pesticides
	• teaching practical nutrition education in order to promote healthy diets and lifestyles
	• providing students with a tool for survival at times of food shortages
Economic and food security aims	• familiarizing school children with methods of sustainable production of food that are applicable to their homestead or farms and important for household food security
	• promoting income-generation opportunities
	• improving food availability and diversity
	• enhancing the nutritional quality of school meals
	• reducing the incidence of malnourished children attending school
	• increasing school attendance and compensating for the loss in transfer of "life skills" from parents to children due to the impact of HIV/AIDS and the increasing phenomenon of child–headed households

Note. Retrieved from *School Gardens Concept Note: Improving Child Nutrition and Education through the Promotion of the School Garden Programmes*, p.5, by FAO, 2014, Rome: FAO.

The farming activity of my case study is not connected to an institutionalised school farming programme. The school farm was initiated with the aim to produce food for a SFP according to the headmaster of Kibuko primary school (2012). The objective behind the farming activities is producing food for an entire school and not necessarily using the farming activities as a learning ground. A difference in the objective behind the farming activity at a school does not necessitate a difference in

benefits. Children working on a school farm with the purpose of producing food will automatically learn about food production. They could potentially learn more if the agricultural task was conducted in the framework of a clear learning process and goal – as is the idea in curriculum-connected school farming programmes – but they will still learn something from it.

I am curious about the potential a farming based SFP has to decrease hunger, increase school attendance and improve educational outcomes. On the basis that so many educational benefits are attributed to school farming programmes, I also want to analyse the farming activities in my case study and see if they possibly contribute to improved educational outcomes.

Therefore, I will use the benefits associated with school farming programmes as a inspirational conceptual framework to analyse the farming activities in the case study. Likewise, I will check for known challenges in regard to school farming activities at schools in developing countries, such as exploitative use of children, farming work taking up valuable classroom time, and last but not least the question of the quantity of food produced in regard to the quantity needed.

School farming has been questioned as an appropriate instrument to fight food insecurity at school, because they seldom produce enough food to feed an entire school. However, farming activities at school have shown to have beneficial impacts on food security – short-term by decreasing hunger and long-term by teaching children how to produce food. Additionally, they are associated with many educational impacts, as illustrated in the FAO table above.

Summing up, school farming and SFPs have been associated with increased enrolment and improved educational outcomes through the decrease or alleviation of short-term hunger and through offering a practical learning ground. This is the conclusion of evaluation of a long history of implementations of out-of-house SFPs and school farms worldwide. I am looking at in-house SFPs, consequently, I cannot simply transfer all benefits. The resources of a locally developed SFP are much smaller, thus the quality and quantity of the food is potentially poorer. However, it is very likely that a serving of any kind of meal at school will make school more attractive for both children and parents and consequently increase enrolment regardless of the quality and quantity. A meal composed according to the health requirements of a child is preferable to a meal "only" focusing of filling the belly, however, a meal "only" filling the belly is preferable to a hungry child not eating

anything at all. Additionally, a meal "only" filling the belly might decrease or alleviate short-term hunger and thus improve cognitive functions and allow the student to concentrate. The presence of food at school prevents students from leaving school early and motivates them to come in the morning. In Tanzania between 50-75% of children arrive hungry at school and 75% of the schools do not have an out-of-house SFP (TFNC, 2004), so the school either has to come up with their own SFP or have nothing at all. Thus, it is important to know the challenges, impacts and the potentials of such an in-house SFP.

4 RESEARCH STRATEGY

4.1 Action research

This chapter presents the rationality behind choosing action research (AR) as a methodology. AR aims at examining and understanding a situation, at finding an improvement to this situation, and at initiating this improvement. The goal of AR is thus twofold, firstly, to define and initiate a beneficial change, and secondly, to gain a deeper understanding of the situation by analysing and explaining the change taking place (Wood and Zuber-Skerrit, 2013, McNiff and Whitehead, 2011). Through this project I want to gain a deeper understanding of what role hunger plays for a child's education and what possibilities there are to improve his/her educational situation.

AR builds on the core assumption of sociology of knowledge, that the human understanding of reality is socially constructed (Berger and Luckmann, 1967). According to this assumption, the action researcher has to reveal and understand the socially constructed reality of others to understand their actions, interactions, institutions and relations to environment. Acquisition of knowledge of others' realities in a foreign and unfamiliar context and culture might presuppose both literature studies on local culture, and an ethnographical field work based on participant observation and in-depth interviews with stakeholders.

The Participatory AR tradition, in addition, focuses on the empowerment of the stakeholders. The aim of empowerment influences the role of both the researcher and the participants in the research project. The need for intersubjectivity removes the distant and supposed objective researcher. To promote local conscientização the researcher and participants become co-creators of knowledge, actions and reflections on actions.

Interpretivist epistemology lies at the heart of the methodology of AR. It dictates the relationship between research participants and researchers and the knowledge created. The research is not an authoritative picture of a moment standing still – during the research, the researcher and the participant constantly continue to interpret and create reality. AR acknowledges this by making the research participants co-stakeholders of the research (Wood and Zuber-Skerrit, 2013).

I, as a researcher, operate as both a participant and a gatherer of information, and it is important to note that the participants are more than "simply" owners or holders of a knowledge, but rather, active stakeholders in the knowledge creation.

I still remain in the role of researcher; guiding the analysis in the field and doing analysis and writing afterwards. AR is a "collective self-reflective enquiry undertaken by participants in social relationship with one another in order to improve some condition or situation with which they are involved" (Berg and Lune, 2012, p.259). Both the idea of what can be done to improve a condition or a situation and the realisation process of this idea are the result of a self-reflective dialogue and collaboration by stakeholders of the research community and the researcher.

It is possible to contest the social construction of reality by engaging the stakeholders in a discussion on the differences between their own perception of reality and others. By having to define their reality and their position within it, stakeholders might go through an "enlightenment process" and become conscious of their surroundings and their role within them. It creates a possible escape from their "Kantien Unmündigkeit" (Kant, 1784).

Action or social change transcends the enlightenment process of a person by adding wanted change to thought. Paulo Freie (Freire, 2000, p. 79) defines a social change in the form of a liberation as "a praxis: "the action and reflection of men and women upon their world in order to transform it". Action and reflection are not separate, but interdependent and forming each other. Likewise, practice and theory are not opposite or separate (Winter, 1989, Freire, 2000). Freire's (2000) concept "*conscientizaçào*" is about becoming conscious of your own or your community's place in society, the social hierarchy of power, and the history behind existing social organization and power structures. According to Freire (2000), the ability to transform a situation for the better is dependent upon a process of conscientizaçào.

In this project my aim was for the stakeholders to engage in critical discussions about their environment, perceived challenges, and possible solutions. Throughout the discussions, I wanted to facilitate conscientizaçào through raising awareness of the stakeholders' relations to their environment. Freire (2000) refers to this process as dialogical practice.

Hopefully this awareness will make them able to transform their environment in a beneficial way. Through dialogue, stakeholders might become more aware of their environment and able to identify problems (theory). They become part of their

environment by realising their position and role both within it. The realisation of their role in their environment enables them to act (practice).

There are different branches within AR. The AR approaches can be grouped in three overall AR modes: the technical/ scientific/collaborative mode, the practical/mutual collaborative/deliberate mode and the emancipating/enhancing/critical science mode (Berg and Lune, 2012). In the scientific/collaborative mode the researcher is apart from the group and communicates and gives inputs via a facilitator. The facilitator "tests" a problem solving strategy and reports back to the researcher. In the practical/mutual collaborative/deliberative mode the researcher and the facilitator decide on the problem solving strategy together and the facilitator works and revises this problem solving strategy with the research participants further. This mode is thus more collaborative with the research population and has a greater focus on empowerment. The facilitator also reflects on his relation to the research population. However, in this mode the achieved change often ceases when the facilitator leaves the field because it is too closely linked to him or her. In the emancipating/enhancing/critical science mode the overall research goal is to initiate change through emancipating the group by having them face a problem that needs to be solved (Berg and Lune, 2012). I am following an emancipating/enhancing/critical science mode, because it focuses on the change being for the continuous improvement of the participants' situation rather than for the purpose of research.

The emancipating AR mode "promotes emancipatory praxis in the participating practitioners; that is, it promotes a critical consciousness which exhibits itself in political as well as practical action to promote change", (Grundy, 1987). Firstly, I believe that humans continuously create and recreate their perception of reality through interaction. Situated participatory AR can involve and enable stakeholders in situated knowledge creation. Secondly, I believe that the way stakeholders perceive their role in this situation enables or disables them to change this situation. Concluding, I believe that through engaging in dialogue with stakeholders about important situations and their roles in these situations, their roles, and thereafter their ability to make changes, become clear. In this way, conscientizaçào enables and initiates change.

4.1.1 How is the theory of action research influencing my practice of action research?

The six principles for the conduct of AR outlined by Richard Winter (1989) harmonise well with my understanding of knowledge creation and social change. Below, I present my interpretation of the main content of each of the six principles, and how I approach the principles in the AR project of this master thesis.

Principle one is Reflexive critique. Reflexive critique applied in research means that I am aware of how my own reflexive judgements, and those of each participant, influence our "apparently" objective descriptions of things and that I as a consequence do not assume an authoritative voice in my thesis. Reflexive judgement means that someone's description of something is always reflecting his or her own subjective experience and not the unambiguous description of events (Winter, 1989).

Dialectical critique is the second principle. It is the discussion of the contradictions and unifying elements of a phenomenon that qualify as understanding according to the principle of dialectical critique. A phenomenon is not exclusively made up of harmonising elements forming its unity, but rather, it is equally made up of opposing forces, and the interaction and struggle of those opposing forces is what creates change. Thus, in order to understand a phenomenon I cannot simply observe and describe a change in isolation from its surroundings. I need to understand the context in which a change takes place, because it is the context in which it is happening which defines it (Winter, 1989).

Whereas the first two principles are about knowledge creation, the third principle is about my role as a researcher and acknowledging that I am not impartial and doing more than "only" collecting data. Through my research I become a stakeholder in a situation (under investigation), and the knowledge created is the result of the interpretation and discussion of the different understandings of the situation. Principle three is titled collaborative resource (Winter, 1989).

When I, as a researcher, follow the principles of reflexive critique, dialectical critique and collaborative resource, the principle of risk is inevitable. It demands that I as a researcher expose my initial interpretations, my decisions of what is relevant and what is not, and plan to question and adapt everything if necessary (Winter, 1989).

Principle five, plural structure, addresses the challenge of writing a research report that is non linear. The researcher in AR does not assume an authoritative voice, but rather seeks to present the phenomenon investigated in a way that reflects a fair and holistic picture of it, with its harmonies and contradictions (Winter, 1989).

Principle six, "theory, practice, transformation," discusses the close relationship between theory and practice and how they are not opposite of each other, but instead each carry elements of the other and develop because of the other, which is where transformation comes into play (Winter, 1989). This principle, as discussed deeper in the previous section of this chapter, is why engaging in action and research simultaneously is a fruitful process for both knowledge creation and social change.

These 6 principles act as my code of conduct in field research and analysis. They equally serve as the structuring framework for writing and reading this paper. These principles reflect my thinking and thus assist the reader in following my arguments and engaging in the discussion.

4.1.2 Action research – a circular and progressive approach

Participatory AR suggests a cyclical research movement, in which the stakeholders of the research first collaboratively identify needs in particular situations, and then decide on the best course of action in order to initiate the necessary change. Both during and after the realization of this action, they analyse and evaluate what effect the action had and what can be done differently in the future (Wood and Zuber-Skerrit, 2013). AR data collection can be visualised as a continuous cyclical movement of planning, acting, observing, evaluating and re-planning, which approaches the research goal step by step. Figure 5 illustrates this flow of research steps of collecting and analysing in a continuous spiral movement.
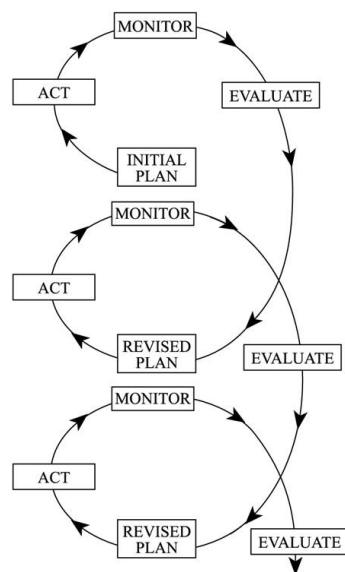
Source: Kemmis (1983)

Figure 5. Kemmis spiral: The spiral movement of action research. Retrieved from '*Action research',* by S. Kemmis, 1983, Oxford, Pergamon.

Building upon figure 5 and following the suggested cyclical research movement, we start with an initial plan (step 1 – initial plan) of a research design, then try out this research design (step 2 – act I), then follow up on this for a while (step 3 – monitor), and finally evaluate the data collected and the way the data was collected (step 4 – evaluate). Based on the results of the evaluation (step 4) we revise the initial plan (step 5), so that it integrates and reacts to the data collected in the previous phase. The main objective drives the main direction of the research and sets the overall focus in the data collection and analysis process. The objective does not change, but the way in which the objective is reached is changed if necessary. For this research, this means that the objective of improving children's education by improving their programme does not change, but how the programme is carried out is subject to change in response to data collected in the field. This does not mean I cannot have a plan or idea of how to improve the programme, but in terms of the principle of risk, my plans or ideas are subject to revisions.

The action researcher seeks to discuss questions that are relevant to the stakeholders. This demands a high degree of flexibility from the researcher, but at the same time it also allows flexibility. Nevertheless, the research design and the researcher cannot be purely flexible, since the research is implemented with an objective and the wish to reach it. This research project is focused on a beneficial improvement of children's education. I heard about a primary school in rural Tanzania, which had started a programme where they were farming on the school grounds and using the harvest to cook school lunches. I saw potential for strengthening the programme model further. AR could help the stakeholders to improve the programme, and me to generate knowledge on the programme.

4.2 My action research

I decided on setting different sub goals that I needed to reach in order to reach my overall research goal and objective. Each goal was reformulated into a question, which was used as sort of compass for this phase of the research. Whenever a question has been answered the next phase can start. Each question — the asking of the questions, and the process of getting the answer — would lay the ground work for the next phase to take place. It is not the answer to each phase, but the entire process of reaching each goal of the different phases that is necessary to reach the objective.

My objective was to "improve Kibuko primary school students' educational experience" through the research question of "*What potential do farming based SFPs have for decreasing hunger, increasing school attendance, and improving educational performance?*".

4.2.1 Research Phases

I divided the research into 7 phases. I defined a specific goal that I wanted to reach in each phase. When it was reached, it indicated the end of this phase and the start of the subsequent phase. In each phase, I indicated which methods were used to collect the data. Some phases required additional strategies to achieve the goal. In the table underneath I summarise all phases with their goals, methods and strategies. The research strategies and methods will be presented and discussed in more depth in the following section.

RESEARCH PHASES
Phase I: Entering field site
The first goal was to conduct a situational analysis. This included:
- getting to know the research area, the stakeholders, their situations, the research conditions
- for the stakeholder to get to know me and my research interests
- to discuss my research interest and idea
- to re-evaluate and revise
- to adapt the overall research plan in response to new first hand field information.
Method: - Participatory observation
- Meetings
- Semi-standardised interviews
Phase II: Kibuko programme
Goal of answering question 1: *How does the Kibuko programme work*?.
With the Kibuko programme I refer to the programme that the school runs at the school, where the children work on the farm and the harvest is used for cooking lunches at the school. The headmaster himself always referred to the farming and cooking activities as part of the *programme*.
Strategy: Stakeholder analysis and mapping.
Method: Focus group interviews
Focus group workshops
Workshop with all stakeholders
Participatory observation for triangulation.

Phase III: Educational impacts

Goal of answering question 2: *How does the Kibuko programme impact the children's education?*

Both the positive and negative impacts the programme has on children's education are investigated with the goal of knowing if the programme is beneficial for children's education or not, and to increase the stakeholders' awareness of the programme's (possibly beneficial) impact and thus importance.

Strategy: Dialectical discourse and workshop on benefits of school feeding programmes.

Method: Focus group interviews

Focus group workshops

Workshop with all stakeholders

Secondary data for triangulation.

Phase IV: Action

Goal of answering question 3. *How can the education of Kibuko primary school children be improved?*

The question is an open question that should initiate a discussion that will bring forth ideas to improve the children's educational experience. In case the programme shows to have beneficial impact on the children's education, I want to see if the children's educational experience can be improved further through the programme, and if this reflects a solution that interests the stakeholders.

Strategy: Dialectical discourse.

Method: Focus group interviews

Focus group workshops.

Workshop with all stakeholders

Participatory observation and follow up interviews for triangulation.

Phase V: Exiting the field site

Goal of exiting field consciously and slowly.

In AR I choose to build a relationship with the participants in my research project. In order to respect this personal relationship I also need to calculate enough time to say goodbye and close "open" conversations. I need to communicate that I "end" my participation in the "action" and leave the field, in a way that my leaving does not disrupt the participants' engagement in the action.

Method: Focus group close up interviews and meeting

Phase VI: Writing

Goal of discussing overall research question *"What potential do farming based SFPs have for decreasing hunger, increasing school attendance, and improving school performance?"* and share the truthful story of the stakeholder of the Kibuko programme.

Method: Meetings with supervisors and research assistant

      Organise follow up interviews

      Writing

Phase VII: Knowledge sharing

Goal of sharing research results with stakeholders, Kibuko primary school, and Sokoine University of Agriculture (SUA).

This is the story of a Tanzanian community and their idea for improving their children's education, so the *owners* of the story and the Tanzanian people working within the education sector in Tanzania should be able to access the story to develop it further; theory and practice live of and develop each other.

Method: Translation of a part of the thesis into Swahili

      Share translation with SUA, EPINAV and stakeholders of the primary school of Kibuko.

4.2.2 Research strategies

Previously in this chapter I have related my approach to the AR project to Winters' (1989) six principles for the conduct of AR. In addition, I have elaborated a stepwise strategy for the research project building on the cyclical and continuous performance of planning, acting, and evaluating that characterizes AR. In the three main data collection phases (Phase II, III and IV) I needed some additional data collection strategies. These strategies are presented here.

4.2.2.1 Stakeholder analysis and mapping – strategy Phase II

I will use stakeholder analysis as the supporting framework for analysing the situation. Stakeholder analysis can be used as an analytical tool to determine who are the stakeholders of an organised environment and to generate knowledge on how these stakeholders behave, how are they related to each other, and how they are related to the organized environment (Brugha and Varvasovszky, 2000).

Stakeholder analysis has become a tool to create knowledge on a certain situation and phenomenon in the development sector which reflects an acknowledgement of stakeholders' central role and power in the shaping of a process (Brugha and Varvasovszky, 2000). Stakeholder analysis makes the stakeholder of

"whatever is to be analysed" the centre of the research and believes them to be influential in making decisions. I seek to understand the programme through visualising how the stakeholders relate to it and to each other in a map.

I want to understand how the Kibuko programme works, how it came into existence, how the Kibuko programme is socially organised and embedded, what is the role of the students, teachers, parents, and community in it, what decision making power do the different stakeholders have, and what are the different stakeholder opinions and behaviours towards the programme. Stakeholder analysis allows an understanding of a programme with a focus on the people and social dynamics. Stakeholder analysis helped me to structure this process and to order the data collection in terms of how to group different voices and how to create a systemised visualisation of my understanding of the programme.

This aligns with the principle of reflexive critique, where one is aware of one's own subjective experience through reflective judgement of what one perceives as the "objective truth or observation". In the stakeholder mapping, the differing perceptions of stakeholders related to the programme are voiced, and therefore become visible and tangible. The mapping addresses and activates the reflexive basis, which not only leads the participants to learn about their own situation, but also about the other participants' situation, and it leads to a more common - not necessarily a more uniform – understanding of the system.

The map consequently creates a common understanding of the programme between the stakeholders and me, so that we understand the programme the same way and have a basis to refer to.

4.2.2.2 School feeding programme benefits workshop - strategy phase III

Research on SFP and school gardens served as a basis of knowledge to analyse and discuss the Kibuko programme. The secondary data served as a guidance note and checklist to analyse and discuss the impacts the SFP has had on education and hunger situation. The goal was not to evaluate if the Kibuko programme is more or less efficient than other implemented SFPs, the goal was to place it within the SFP sector and understand the potential it has to contribute to the improvement of SFPs. My research questions is *"What potential do farming based school feeding programmes have for decreasing hunger, increasing school attendance, and improving school performance?"*. All three impacts are typical impacts and benefits

of the implementation of SFP and the objectives for their implementation. Nowadays SFP's are commonly implemented for specifically these reasons, thus I want to benefit from all the knowledge and expertise acquired and existing, and use it to understand the impact the Kibuko programme has had and what it could have done better.

4.2.2.3 Dialectical discourse – strategy phase IV

Dialectic (or dialectics) originates in Greek and the literal meaning is 'through or by means of words' and is translated as 'the art of discussion'. Dialects is not understood as a form of discussion 'only' though; dialectic is a form of discussion that leads to an understanding of reality and as such it is also a theory of the nature of reality - of how reality is formed through discussion. Dialectics is the process of critical analysis of mental processes leading to the "truth" (Winter, 1989).

Dialectical discourse (or dialectic discourse) is applying dialectic as a method. Dialectical discourse is a form of discussion which aims at reaching a consensus on a subject through the process of presenting, reflecting, and discussing the different perceptions of stakeholders. I conducted semi-structured interviews and held workshops to foster dialectical discourse.

Paolo Freire attributes this process an empowering and emancipating dimension:

> "[e]very human being, no matter how 'ignorant' or submerged in the 'culture of silence he may be, is capable of looking critically at his world in a dialogical encounter with others. Provided with the proper tools for such encounter, he can gradually perceive his personal and social reality as well as the contradictions in it, become conscious of his own perception of that reality, and deal critically with it" (Freire, 2000, p.13).

The dialectical discourse raises the consciousness about their environment and their role in it and as such, sets the basis for the stakeholders to assume an active role in shaping this environment for the better.

4.2.3 Research methods

Here I discuss the concrete data collection methods applied in the different phases. I collected data through semi-structured interviews with individual stakeholders or focus group, and workshops, and participatory observation. A translator assisted me with conduction of interviews and workshops. I recorded the data manually through hand written notes. Due to the extreme humidity in the research area my computer broke and the majority of the visual documentation and some of the pictures and videos of such were lost.

4.2.3.1 Interviews

Interviews can vary in how structured and flexible they are; they can follow a predetermined plan with a list of questions that need to be followed and not allowing any flexibility or they can be an open conversations (Berg and Lune, 2012). To implement my AR approach, I needed my data collection method to allow the interview to change direction. The stakeholders could come up with new questions or answer a question in an unexpected way that would lead the interview in a different and new direction.

I am not only looking for the answer to a question. I want to understand the origin of this answer, what is the story leading up to the answer, and what is the context of the answer. The flexibility that semi-structured interviews offer, parallel to allowing to remain focused by setting some guiding questions, makes it the suitable method (Berg and Lune, 2012).

For each interview I had prepared an interview guide, in which I had noted down how I wanted to open the interview; some points that I would always have to check off, such as asking them for their consent and explain their right to stop the interview at any time and that they were entitled and invited to ask questions as well; questions guiding the interviews and strategies on how I would approach more complex topics more sensitive questions; ideas how to explain the more complex questions that I had. Prior to the interview I would discuss my interview design and idea with my translator and assistant and then adapt the interview guide in case we had come up with improvements. Sometimes I would also ask the headmaster for advise on how to approach a topic or a certain stakeholder group.

4.2.3.2 Workshops

In order to improve the Kibuko primary school education situation, I held workshops, where we discussed and defined the challenges and hindrances to an improved education experience and come up with solutions. It is in this workshop setting that I planned to engage in dialectical discourse and raise the stakeholder awareness of their situation and motivate them to become active players in the situation. The workshops were to become a platform of communication and active problem solving and agenda setting.

4.2.3.4 Triangulation

Participatory observation and results of education outcomes was used to triangulate findings from the interviews and workshops. I use the findings from the triangulation to compare if what the stakeholders told me corresponds with the observation in order to see if what they told me is true. Furthermore, I compare my observation with the findings from the interviews in order to compare if what I see corresponds with what I expected to observe, based on how I understood the description of the stakeholders. Here the objective of comparison is to check if there are communicational misunderstanding between the stakeholders and me.

4.2.4 Research participants

I was interested in talking and working with everyone in Kibuko village, those who were a stakeholder of the programme, those who had an opinion on the programme had something to do or wanted to have something to do with the children's education experience at the school or those who were involved in the programme. The grouping and selection of stakeholder groups is done according to their role in and relation to the students' education. Students and their education are the centre and focus of this research and the stakeholders were grouped and "labelled" according to their relationship to the children's education. Who the different stakeholders were, was identified with help of the stakeholder analysis explained above. Stakeholder analysis offers a useful tool for not only understanding the overall interplay of actors and their interest in and influence on a process, but also to classify the actors according to their influence, which then gives the opportunity to focus on the core stakeholder, who are most likely to be making the decisions (Lindenberg and Crosby, 1981, Brugha and Varvasovszky, 2000). The core stakeholders of the programme were the participants and thus stakeholders of the research.

I did the primary selection of participants based on my assumption on who could play a role and in a second step I used the stakeholder analysis mapping process explained above to find out stakeholders of the programme. Additionally or maybe rather integrated in the stakeholder analysis I applied the snowballing principle and asked stakeholders I would talk with, to suggest further suitable stakeholders in the programme and participants in the research.

The different stakeholder groups were: Teachers (headmaster, government teacher, volunteer teachers), parents board (Parents elected by the parents to help out

on the farm and at the school), school committee (Parents voted by all parents to be on the school committee and control the school), students (Students of Standard 6 and 7), research team (translator and mediator, researcher (me), headmaster). The research team was set up of my research assistant and experienced development worker in the case study region; the headmaster and initiator for the programme; and myself the AR initiator. Some stakeholders are part of more than one stakeholder group and this certainly made the data analysis more challenging, but this reflects the reality in the field. People take on various roles in their life and not only one.

I had anticipated to see the village leader as a stakeholder in the Kibuko programme, however the village leader did not show to have interest in the school or have a voice in the school, as a consequence he did not end up as part of the stakeholders of the research project. The stakeholder list was decided by who was indeed a stakeholder of the programme and not by whom I as a researcher anticipated to be part of the programme. In regard to the student stakeholder group I had some requirements: I wanted the stakeholder representing the student populations to have both girls and boys in order to hear at least one member of each group's voice. I concentrated on Standard 6 and 7. I concentrated on those two standards, because they had been at the school long enough to experience the school without the programme and then with the programme. They could reflect on the changes the programme brought because they lived them. In addition I wanted to talk to Standard 6, because they would also be present at the school for another year, so they could share the experience of the beneficial change (if it was to happen) with the others students.
In the classical stakeholder analysis, the one making the stakeholder analysis and mapping was not defined as the stakeholder itself, however choosing AR as a research approach, I have to be conscious about my role in both influencing my research environment and influencing the process of creating knowledge by my subjective understanding, I cannot assume that I'm invisible or objective.

4.3 Research challenges and changes

In the field I was confronted with various challenges that made me revise my methodological decisions and plans. Usually the research methods planned and how they were followed are described separately from each other and in the chronological order in which they took place. To allow a presentation of methods used before the

data presentation and allow a focused presentation of findings and discussion later, I will discuss some methodological decision and changes, which were made during the data collection already in this chapter.

The rainy season and peripheral location of the research site changed the assumed research site conditions significantly and the initial methodological decision had to be adapted to the new conditions.

4.3.1 Documenting of data

All the data collected in the field was collected in form of hand written notes and later digitalised. The original plan had been to voice record the interviews, but the research conditions and the design made that impractical. The data collection was based on verbal dialogue, which was rendered impossible by the extreme noise the rainfall produced. At various times the interviews had to be aborted due to heavy rainfalls. To change the interview/workshop site was not an option – meeting up at the school already required the farmers to walk 1 – 3 hours and sacrifice this possible work time. Furthermore the absence of electricity in the research site and the total volume of that data collected would not have allowed a transcription afterwards. Writing the conversation down by hand required a lot of time and discipline and hand written notes were certainly not able to capture the whole conversation like a voice recording would have. However, it did both force me to note down all the meta communication that happened parallel, but it also allowed me to note down emotions and reactions of the different participants right next to their answer.

In AR the researchers him/herself and the researcher together with the participants reflects on earlier discussions and conclusions, which required the data earlier collected to be accessible. Without the possibility of immediate transcription and print out I had to refer to writing by hand. Hand written notes allowed me to keep an overview, keep the chronology of the data collected, track changes in participants' opinions and my own analysis of findings.

I ended up digitalising all data in order to facilitate the analysis of the data. Firstly, a digital form of your data allows you to search for a specific topic and term fast and efficiently. Secondly, it allows you to try out various types of qualitative data analysis tools; I used colour coding. In addition, it enabled me to share the data with fellow researchers and to refer back to data for future research purposes.

4.3.2 Use of translator

The interviews and workshops were conducted with the help of a translator. Using a translator adds an extra link between the participants and me and thus potentially increases the misunderstandings and loss of information. However a translator that comes from the same culture, country and possibly area can also act as intercultural translator and increase my understanding of the research area and culture.

Solomon Nicholaus, a Tanzania farmer and development worker, acted as my translator, facilitator and mediator.

4.3.3 Ethical considerations

Every kind of research influences the research community by simply interacting with the people and talking with them about a certain subject. A certain sensitising of the topic in focus of the research population happens automatically. As discussed in the previous section, reality is constantly created thus every kind of interaction – including a questionnaire – has the potential of changing the interviewer's or the interviewee's perception of reality.

AR incorporates the potential catalysing effect of verbal interaction on a topic can have on the research community into its methodology and makes this the focus of the research. AR studies the changes happening during and possibly because of the research. In this research project, I consciously planned to engage in dialectical discourse, raise the stakeholders' awareness of their situation, and motivate them to be an active player in the situation and work for beneficial change. It is the stakeholders of the research community that define not only the nature of this change but also what needs to be changed and what not. I at no point of the research had the wish to define or manipulate the stakeholder's opinion in my favour. However, by setting the focus on the programme's potential to improve the children's education I do suggest a possible direction the change could take. This poses a great dilemma for me. The principle of collaborative resource, of risk and plurals structure, which all force me to listen to the stakeholders wishes and not take an authoritative voice do provide instrument to deal with this dilemma or change related to conducting AR.

4.3.4 Cross cultural and lingual research

I was conducting a cross-cultural research project. Different cultures create some uncertainties in interpreting the words spoken. AR therefore places a high priority on discussing stakeholders experience and context in order to better

understand the answers given. I need to spend time establishing a relationship and reciprocal trust in order to avoid or deal with cross-cultural misunderstandings. I studied Swahili in order to understand the culture and people better and to facilitate building a relation of trust with the stakeholders by being able to engage in smaller conversations. The translator would act as an intercultural translator as well and help me understand the culture and how I could move around in the research area. There are some cultural codes, requiring you to consider the way you dress in order to avoid that there is more attention on my clothing than on the research topic.

This chapter described the plan of the field research, whereas this and the following chapters will present this plan's execution.

FINDINGS

The findings and analysis is presented in three parts, which are outlined as follows.

Findings Part I   Story of the research

Findings Part II   Findings and analysis

Findings Part III   Discussion and commentary

Part I is a window into the field research that explains the main events of the research story between February 2014 and September 2014. The research story presents some findings already, and shows the AR inspired working technique. In Part II, I focus on answering the three questions. This part will refer back to findings presented in chapter 5 the story of the research. The answering of questions in Part II all lead up to Part III, where I discuss the main research question: *"What potential do farming based school feeding programmes have for decreasing hunger, increasing school attendance and improving educational performance?"* and make some comments on limits, challenges and sustainability of the programme.

AR is people centred and a collaborative process thus its course is unpredictable and non linear. The data cannot be presented in a strict chronological order from theory, methods, results and analysis, because AR follows a cyclic movement and alternates between the different steps; thus, the findings presentation is non-linear.

FINDINGS PART I

5 Story of the research

The research story is told from three different angles. The first angle will give an overview of the methodological steps and decisions taken in the different research phases. The second angle will shed light on the overall story of the field research. Since the research took place over several months, a general storyline of research events is preferable to tracking each data point. I selected core field research events, which are relevant for answering the questions. Additionally, the graphic on the next page gives an overview over the main events.

From the third angle, I focus on a group interview of two pupils from Kibuko Primary School. This particular research conversation highlights the methodology of emancipatory AR by promoting critical reflection through dialectical discourse. In AR, both the results and the data collection are important, thus both are presented and discussed.

5.1 Methodological steps in the field

Overview of Methodological steps in different phases
PHASE I (February and March 2014)
The first meeting was spontaneous. The primary school of Kibuko had a workshop on this day, where another school in the region was visiting and they were exchanging experiences in farming and animal husbandry on the schoolyard. I was attending this workshop as a guest. During the workshop, I gained some insights about the research community and I realised that a majority of the stakeholders of the programme had to be present on this day. At the very end of the day, I got the chance to present my research idea. Thereafter, I asked the workshop participants if they wanted to meet me again and talk more about this research idea.
The purpose of the following meetings was to introduce myself and my research project to the school and the village. I wanted to find out who was involved in the school and had something to say, to create a common understanding of the topic of the research and why I was there, and to find synergies between what I wanted and what they wanted. When I had reached these objectives, I could, together with the participants in the project, move on to Phase II.
PHASE II; III AND IV (March, April, May 2014)

The overall design and strategy of phases II, III and IV was the same, thus I explain them together.

1) I first would hold a meeting with all stakeholders present and discuss my idea and plan for this phase with them. The objective of this first phase meeting was twofold; I wanted them clearly to understand my plan, and hear what they thought about it so I was able to integrate their inputs in the plan.

2) Afterwards, I would hold both individual interviews and focus groups interviews.

3) Based on meetings and interviews, I would analyse the data collected, draw an intermediate conclusion of my understanding and find a way to visualise the analysis.

4) Central themes of discussions would be if the stakeholders agreed on my understanding of what they had told me and on my conclusions from interviews and meetings. My aim was to highlight appearing contradicting understandings and differences in perspectives and opinions. The purpose was to facilitate empowerment of each stakeholder by motivating them to form their own conscious opinion of a situation and their role in it.

5) I would analyse the newly edited conclusion and see if I we had reached of common understanding among the stakeholders and between the stakeholders and me as background for either holding further discussions or moving on to the next phase.

6) At the end of each phase, I would organize two kinds of workshops. In the first workshop I would present my findings from the earlier phase and the conclusion I had reached on the basis of the focus groups interviews, individual interviews and participating observation. We would discuss these conclusions as described above in step 4. If everyone agreed on the conclusion and my analysis would not bring up new questions or discussions, these workshops would be short. In the second workshop, I then would present the revised version of my conclusion based on the last workshop and hand them a written document. The purpose of these two workshops and the hand-outs was first to make sure I had understood what the stakeholders told me, second to give them something back and third to increase their awareness of their own voice and place in the programme, and last but not least decide which of discussed topics, ideas or questions should be pursued further.

5.2 Story of the research

Phase I and II (February and March 2014)

During the first and second phase I learnt the story, not only of the programme, but also of the school, the struggle to get the farmland, and the everyday life of the children and teachers of in the village. Previously, a strong, ambitious and good-hearted female headmaster had fought hard to get the school built where it stands today and convinced the authorities to give farmland to the school. Thus, Kibuko Primary School has a long history of farming.

Unfortunately, this history is tainted; the parents and headmaster told me that many of the previous headmasters abused the pupils for labour on the farm and used the harvest for their own purposes. Allegedly, the last headmaster was an alcoholic who abused the pupils sexually. In 2012 the district authorities removed him from his position, after he raped and impregnated a female school pupil (Vice-headmaster, interviewed 10.03.14). According to the parents and teachers, alcoholism, labour exploitation and sexual abuse of pupils was common both at Kibuko primary school and at schools of neighbouring villages.

The stakeholders clearly differentiated between the eras where the school had "bad" headmasters and the era with the "good" headmasters. Very first headmaster and the current headmaster are classified as good because they care about the children and lead a school for the purpose and benefit of children's education. The bad headmaster are defines as those who do not care about the children, stand in a bad relation ship with the parents, drink to much alcohol, exploit children as labour force or abuse children sexually. Stakeholder groups such as the school committee, parents board, and volunteer teachers witnessed these different teachers and agree on these classifications.

Prior to 2012, the school had become isolated from the Kibuko community and the villagers had developed an antagonistic relationship towards both the school and teachers. Thus, when today's headmaster arrived and wanted to start farming on a larger scale, the community met him with resistance and suspicion. The current headmaster confirmed this story. He stated that convincing the parents to support the programme required patience and lots of mediation (Headmaster, interviewed 24.03.14). Eventually, the community recognised his work, became grateful, and began to trust in the new headmaster.

The parents and the pupils echoed the headmaster's story. Prior to his arrival, the school did not use or cultivate their fields properly. Immediately after arrival, he encouraged the teachers to collaborate with pupils to cultivate food for consumption at school (Students, interviewed 12.04.14 and Parents, interviewed 12.03.14) Most parents welcomed the programme and associated it with improved learning ability and motivation to go to school of the children. Two parents said: "Students can participate fully in the class. They can concentrate when they have eaten." (Parents, interview 12.03.14) "It improves the school attendance as children are more motivated to go to school." (Parents, interviewed 12.03.14) Another parent added: "It is a big relief for them [the parents]. They [the parents] can concentrate on their work better and not have to worry about what food to make for their children." (Parents, interviewed 12.03.14).

The hunger problem at the school was worse and more complex than I had anticipated. In a workshop on 05.04.14 I asked the stakeholders together to find out or guess how many children were affected by hunger during a school day now that they had stopped cooking. The goal of this discussion was to have the teachers, parents and children talk together in hopes they could collaboratively realise the reality of the situation. Of the 362 children at school (which included 40 Kindergarten children and the 323 children of Standard 1 to 7), the response was as follows: "3 of 4 live far away from the school, so they cannot simply run home when they are hungry. So these ¾ of children are all affected by the fact that the school does not serve them a meal over lunch." I asked a follow up questions: "And how many – more or less – of all students bring lunch to school now? Now that they have to bring lunch if they want to eat something?" Group's conclusion was: "1 out of 5 comes with food and 4 out of 5 come without and are affected by the hunger" (Workshop, 05.04.14). Moreover, the children did not consume breakfast. Accordingly, the majority would arrive hungry at school and gradually become hungrier (Workshop, 05.04.14).

A child's hunger and food security is influenced by a range of factors, including food availability and infrastructure to make food. Thus, the ecology of hunger at the school is complex. A child needs to be able to access food when they are hungry and have simultaneous access to the necessary cooking facilities and ample time to prepare food. In rural areas it is not simple to make a fire and cook food, because there is no artificial light, no electricity, no drinking water, and most families cannot afford charcoal for cooking. During the rainy season, wood is wet and air is

humid, thus making it even more difficult to make a fire. Parents themselves do not prepare breakfast when they have to start working in the field early or walk to a market, which is located a couple of walking hours away. Both parents and children have to get up early, because they have to walk long distances in order to reach either work or school. Depending on where the children live they have to walk up to an hour to reach the school, thus they have to get up early when it is still dark and cold if they would want to make food. The children say they do not want to get up even earlier and collect fire wood in the dark and cold and prepare breakfast.

Participatory observation and interviews also shed light on other challenges at school. Due to acute lack of teachers, the parents recruited and paid volunteer teachers without a teaching education. A "volunteer" teacher is the English term used in Tanzania to refer to non-government teachers working at schools, as they are being paid by school fee contributions of parents. In the 2014 spring semester, the state had for example only provided three government teachers for Kibuko primary school – a school of 336 children (Headmaster, interviewed 05.05.14). This resulted in an insufficient student/ government teacher ratio of 1:112[7]. In addition, the school lacked basic infrastructure from school benches, classrooms, sanitary facilities and kitchen. The school also lacked basic teaching facilities like paper and pens.

Due to lack of school funds, the parents had to pay exam costs, external examiners and other mandatory expenses (Headmaster, interviewed 25.03.14). Each school defines and decides the school fee contributions from parents. In addition, the school fees vary between standards. In Kibuko the approximately yearly school fee contributions for a pupil in Standard 1,2,3 and 5 is 4000 - 5000 TSH, kindergarten is about 10'000 -12'000 TSH whereas the parents' contribution is around 15'000 - 20'000 for Standard 4 and 6. Standard 4 and 6 have national exams that are costly (Headmaster, interviewed 25.03.14).

A significant issue raised by all stakeholders, was the preparation of students for the primary school leaving exam (PSLE). The student teacher ratio was too low to teach a school of 336 children. This brought another issue: the challenge with too few teachers and with teachers that do not want to work in remote areas. In Tanzania, teachers cannot apply for a job at a certain school. The government randomly

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[7] The total amount of students enrolled varies during the semester and between the semesters. In spring 2014 there were 3 government teachers and 336 students (Standard 1 till 7). Number of students divided by number of teachers = student teacher ratio.

distributes new teachers throughout the country. In addition, the government might move teachers from one school to a school in another district after a few years. According to the headmaster, government teachers that get a job in rural areas like Kibuko, express the opinion that the environment is undesirable. Of the two government teachers at Kibuko Primary School (excluding the headmaster), one was in Morogoro on sick leave. The headmaster continued:

> "The government is to blame as well though, because they allow the teachers to complain - they accept a "fake" complaint. And they allow such an unfair distribution of teachers." and "Another issue regarding the government teacher's is there work willingness - even when they decide to stay. They do not do anything outside their direct duties, but they do not even do everything that they are supposed to do. […]. They are employed and paid by the government and not by the school they are working at. The volunteer teachers work a lot better, because they have to earn their money hour by hour and prove they are worth the extra money", (Headmaster, interviewed 25.03.14).

The vice-headmaster (a government teacher herself) said the school committee had employed five additional volunteer teachers to try to meet the syllabus requirement, but still they did not manage (Vice-headmaster, interviewed 10.03.14). What the government expected from the school in terms of preparing over 300 students for the PSLE did not correlate with government's distribution of teachers, teaching supplies, and infrastructure.

Based on what I had learnt, I could not address hunger in isolation: The children's learning situation was certainly affected by hunger, yet was also greatly affected by lack of teachers, lack of financial resources and poor teaching facilities.

The social cohesion between the parents, the school and the pupils appeared to be strong. I participated in a parents meeting at the school to which had almost 100% parent participation. The new government teachers that joined the school only recently mentioned this strong relationship and collaboration between the school and the parents as one of the programme's benefits. The new teachers were not used to active parent participation from their previous teaching experience at other schools (New government teachers, interviewed 05.04.14). According to two other researchers on education in Mgeta region (Athman Ahmad and Vituce Kalungwizi, meeting 21.03.04) the active and numerous participation of the parents at the Kibuko primary school was special, because it did not reflect the norm in the region. Apparently, only a dozen parents would show up for a parents meeting at schools with similar amount of pupils. The social cohesion between the school and the parents' interest in their children's wellbeing was reflected when the parents and the school

agreed to participate in the research project. This research project demanded them to set aside a couple of hours each week and the "only" thing they would get in return was a potential improvement in the children's education at Kibuko primary school. The potential improvement demanded them to sit together with me, to identify current threats and challenges to the both the programme and their children's education, and to consider solutions and improvement strategies.

I introduced them to the theory that children can potentially learn about math and history and many other subjects through farming activities. I also showed them my analysis of the curriculum of the different subjects taught in 6 and 7 at Tanzania primary schools and how syllabus outcomes could be obtained by integrating farming activities into school curriculum. This was one of my ideas to improve the school learning environment and strengthen the programme, however, the idea of the AR project was that we would identify an action together.

The headmaster was especially engaged in improving the programme. From the very first meeting he was facilitating and mediating between me and other stakeholders. The headmaster became an active and ambitious stakeholder in the research project. He took an active stance and told the stakeholders to not be too impressed by fast change or be demotivated by slow change;

> "they should remember how their school once was (when he arrives in 2012 for example) and how far they had moved since then. They had started farming, they had started cooking, they had started goat husbandry. Right now they were in the process of planting a tree nursery, which one day would be trees, but that would take time and demand patience", (Headmaster, interviewed 05.04.14).

After a couple of weeks, I gradually obtained a broad understanding of the organisation and structure of the programme and of everyday life at school. I noticed that my observations of the programme contradicted the programme as described by stakeholders. According to the stakeholders' description, the programme was cooking lunch around three times a week, However, I had only observed the children preparing (and eating) lunch twice per week. They headmaster explained to me that they had stopped cooking three times a week at the end of January 2014 (Headmaster, interviewed, 25.03.14). The stakeholders said the interruption was temporary and that the school would start cooking again three times a week. Pupils, teachers and some voluntary parents were still farming. The harvest was not sold, but all stored safely. The reason given for the interruption of cooking came from parents who had started

questioning the safety and appropriateness of children cooking (Headmaster, interviewed 25.03.14).

The parents' change in support of the programme originated in the regional politics. It was election year and external politician of the opposition party had come to Kibuko village in order to raise the constituency for the opposition party. The headmaster informed me that the politician had used the school as a debate topic and said the government in power had promised free schools and school meals. He had stated that the government was responsible for feeding the children and for paying for the school. Consequently, school fee contributions were not any duty of the parents or the children. Therefore, the parents were not supposed to pay or support the programme at the school. Many parents in the village became insecure about how to react to this message. Parents were withholding payments for school fee contribution (they had time to pay it from January to May – this was in April), and started to question the righteousness of the programme (Volunteer teachers, interviewed 10.03.14, and headmaster, interviewed 25.03.14, and students interviewed 14.04.14).

The decreased payments squeezed already scarce resources from the school and hurt the programme. The political campaign against the school programmes was probably not the only reason why they had stopped cooking, but likely the initiator. It broke the united front that had previously supported the programme and shifted the spotlight from the programme's success to the programme's challenges. One of those challenges related to the danger and righteousness of the pupils' cooking. Firstly, children could get hurt while they were cooking, and secondly, they would miss school during the time they were cooking. The school had tried to answer these concerns by employing a chef and starting to construct a kitchen. They started to improve the kitchen building, but ran out of money. In April 2014 there was only a preliminary kitchen wall. They also had tried to employ a chef, but no one accepted the salary they offered (Volunteer teachers, interviewed 10.03.14.3 and headmaster, interviewed 25.03.14). Now that the many parents in Kibuko were holding back with paying the school fee, the construction of a kitchen and employment of a chef became even more difficult

The stakeholders and I simultaneously went through the process of understanding why they had stopped cooking. In addition, we discussed how the halt of the cooking and how the political conflict had and potentially could impact the programme and the children's education. Even the attitude toward the programme of

some of the participants in the AR had changed. Some parents brought up the politician's argument in the discussions and tried to demotivate other stakeholders from supporting the programme. We used the discourse platform, we had developed in the hitherto AR process, to create a common understanding of the events and to discuss the different political positions towards the programme.

The question of the impact the programme had on children's education guided **Phase III (March and April).** My interim analysis in Phase III concluded that the programme had been beneficial for the children's learning experience. The national exam results showed an improvement in the school's academic performance since the programme had started. The passing rate of Kibuko primary school of PSLE of 2013 and 2014 was higher than the average passing grade in the whole Mvomero district (PSLE results 2013 and 2014)[8]. The improvement in the PSLE coincided with the period of Kibuko programme, and thus the Kibuko programme can be one influencing factor.

Phase IV (April and May) of the research had the objective of improving the children' education. Originally, I had envisioned improving the children's education by introducing experiential learning to the school and connecting farming and cooking with subjects taught in the syllabus. Due to the situation in reality, a focus on introducing experiential learning would not have met the actual needs and interests I had perceived among the stakeholders. Instead of conducting trial practical learning lessons, we engaged in dialectical discourse on how to start the cooking again and prevent the programme from collapsing. The school was still running parts of the programme, including: goat husbandry, farming, harvesting, storing the harvest, and selling part of the harvest. They were also still cooking before exams. This was a decisive aspect for me and justified pursuing this project, because the stakeholders showed interest in the programme and programme showed organisational resilience.

I hoped that discussing the negative opinions surrounding the programme would increase our understanding of the overall problem, and thus facilitate a solution to it. Hopefully, the process would enable the participants to resolve the challenges. These discussions took place after I had been in the field for two months (see pp. 92-93 for overview of the workshops and interviews of Phase IV). I realised that I had

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[8] The PSLE results (2013 and 2014) of 3 schools in Mgeta division PSLE, including primary school of Kibuko can be viewed in the appendix. A Summary of the PSLE results of the all the schools in Mgeta division of 2009 and 2013 can be founds in the appendix as well. The latter was shown to be in confidence, and can therefore not be published.

established a relation of trust with most of stakeholders. We knew how to talk with each other and the workshop settings were clear. Consequently, the participants were extremely engaged in the discussions. Even the stakeholders, who started questioning the programme and campaigned against it, continued participating in the workshops.

Due to rainy season the stakeholder groups kept changing slightly. During heavy rains people in the Kibuko and Mgeta do not go outside or travel unless necessary. The rain also brings emergencies such as soil avalanches and erosion which destroy houses, farmland, streets and injure or kill people.

The stakeholder group of teachers had changed completely though: two out of three government teachers had left the school by this point (the one remaining was the headmaster), and three new government teachers had arrived at the school. One of the volunteer teachers had found a job and left the school, the other volunteer teachers were still at the school and participating. Due to the fact that these government teachers, if interested and willing, would play an important role in maintaining the programme, we asked them to participate in the research project and they did. I divided the stakeholder group of teachers into on two stakeholder groups based on how long they have stayed at the school and knew the programme or not. The old teachers group was composed of the headmaster and one volunteer teacher. The new teachers group was composed of the three government teachers, who had just arrived.

The continuous change and lack of teachers at the primary school had become part of our discussions regarding improving the children's education. Since the beginning of the research (two months), the two government teachers (next to the headmaster) who were allocated for the school were not showing up for work anymore. One of them said he was sick and therefore was on sick leave in the city (Morogoro town). The other teacher had left to live with her bother, because her mother was sick and she needed to take care of her. The teacher situation was confusing and would change from week to week. Volunteer teachers and government teachers would come and go.

The stakeholder groups of school committee, parents board, teachers and headmaster came up with an action plan about what to do regarding the cooking (Workshop with parents 05.05.12). They agreed that they could not simply start cooking again without a kitchen and a chef, because the predominant opinion of the parents in the village was that it would be dangerous for the children to cook outside and that they would miss school in that time. However they also agreed that it would

be possible, and important for children to take up the cooking again – at least while they were looking for a long-term solution. They all agreed that the halt of the cooking could be jeopardising the entire programme. They concluded that it did not matter if it is the state's responsibility – it is their children's education and they need to do what they can in order to get their children an education. They needed to act themselves and called for a big parents meeting to discuss the matter and find a solution (Workshop with parents 05.05.14).

My discussion with the children had mostly focused on the cooking. Initially, they had the same opinion as the parents, but after long discussions they decided that being hungry was the bigger issue than cooking and concluded that the school should start cooking again. When I left the field in mid May, the school had still not taken up the regular cooking of lunches under the week. They were still cooking before exams and they were still farming. According to the headmaster and parents, the children had started working less hard on the farm in the last few weeks, which they blamed on the fact that they missed the motivation of getting a meal afterwards, which the children confirmed (Workshop 05.04.14). In the following chapter I will expand upon my discussions with pupils regarding the programme, and will utilise an interview excerpt to show the interview process.

5.3 Story of the students

This interview took place on 12th of April 2014 at the classroom at the primary school in Kibuko. Present were Solomon Nicholaus, my translator and research assistant, myself in the role as researcher, and Esther and Steven. They both were students of Standard 6, among the best students of their class. Esther was 12 years old and responsible for farming and Steven was 13 years old and responsible for the goats. Since the beginning, both Esther and Steven had been participants in the research project. In the first phase of the interview, I went [9] through a checklist in my interview guide to make sure to ask for their consent, inform them about their role and rights in the interview.

We had a blackboard in one of the old classrooms that we used as communication wall for the research project, where we had drawn the map of

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[9] In the beginning of each interview and workshop I would go through a checklist in my interview guide to make sure to ask for their consents and inform them about their role and rights in the interview setting. Their rights was to change their statement at anytime of the interview, to notify me that something was off the record, to take a break and to ask me, or any of the other participants, questions.

programme, a road map of the research project and some main guiding points and questions. I used this to point out where in the process of the AR project we were and what I would like to learn from them today[10]. I wanted to learn: what it meant to be "goat responsible" and "farming responsible", what it meant to go to Kibuko school under the Kibuko programme, if there was a difference between going to Kibuko before and after the programme had started, and what they thought about the school having stopped cooking. We had talked about these things before, but our discussions around the programme had improved our understanding of each other and of the programme. This allowed us to concentrate on details and talk about more personal and sensitive topics.

I will focus on a small extract from the end of the interview, where I wanted to discuss the situation of the cooking. Esther and Steven told me that they missed the food at school; they explained that it is hard being hungry despite producing food and seeing the food, and that it is a difficult situation to own so much food, but not be able to eat it (Students, Interviewed 12.04.14). When I asked them what they could do about this situation, they explained to me that they were not eating, because there was no kitchen for them too cook and it generally was too dangerous for them to cook. They explained to me that this was only temporary – the programme would include cooking again as soon as the kitchen was finished (Students, Interview code 12.04.14.S).

I asked them if they were cooking at home, if they knew if other children were cooking at home, which the both answered with yes. I asked them to explain the difference between cooking at home and at school to me, which resulted to be minor. Most children were cooking outside at home as well and they were equally handling knives, fire and boiling water as they were at school (Students, Interviewed 12.04.14).

Whereupon I asked if they agreed with this situation of not cooking, they both answered that they could cook, but then they would miss class during the food preparation time (Students, interviewed 12.04.14).

I then asked if they felt any different on days they ate food versus the days they did not eat anything during school. Esther (Interviewed 12.04.14) answered, "Yes. When I eat it is easier to go to class. It is easier to follow the class - I remember more from class afterwards. When I don't eat I cannot listen to the teacher, because I

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[10] Most interviews would take place in the same classroom on the school ground of the primary school of Kibuko. It was an older classroom that they hardly used for teaching due to its bad infrastructure.

am thinking about food at home". Next, I would ask them about their previous statement (that they do not want to cook due to the fear of missing class). I asked her "So you do not want to cook, because then you would miss class, however when you do not cook you also miss class, because you are not able to concentrate?" Esther (interviewed 12.04.14) responds "Yes." and adds: "When we do not have food, we cannot concentrate".

Esther made a contradictory statement. She argued for a halt in the cooking, because then she would not miss class, however when the students are hungry also miss class. I asked them if they could explain their reasoning to me. We went forward and backward until Esther came up with an idea, which could solve the problem. She suggested: "Maybe it would be a solution to return home from school earlier? So everyone could be at the school in the morning and a bit longer and then they leave earlier, so they can eat at home", (Student, Interviewed 12.04.14). We discussed her idea and I learnt that at home she and most other students cooked. We discussed how the parents would say it is dangerous for children to cook at school, whereas the children cook under similar conditions at home. Esther and Steven came up with different ideas of what they could do to solve the cooking problem, and we discussed them. Finally I asked them, if they had to decide what to do, what would they decide:

> Esther: "It is better to have food at school than to go home and prepare food. But the food has to be prepared by someone else, otherwise we miss class", (Student, Interviewed 12.04.14).

> Steven: "I think it is better when students have to make food at school, rather than to wait for a chef to make the food for us", (Student, Interviewed 12.04.14).

We discussed the pro's and con's of starting to cook at school again. And I asked Esther if there is no chef like in the current situation, would she prefer to not eat or to cook at school? She remains concerned with students missing class, but prefers students cooking and missing some class over not cooking at all: "Cook at school and have more classes is a better solution, but only if everyone – even boys – participate in cooking", (Student, Interviewed 12.04.14).

This is only a glimpse of a long conversation and only one conversation in many.

It was interesting to observe how the children's attitude towards the cooking situation evolved through the conversation. It was not that their opinion changed or that they suddenly came up with new arguments. It was their attitude towards the

cooking situation that changed from initially being exposed to the situation to being part of shaping the situation. They had disliked the halt in the cooking since the beginning of the interview and they had connected the cooking with impacting their learning negatively, but they did not perceive or talk about themselves as playing a role in the cooking situation. They were waiting for the kitchen to be built, a chef to be employed, to start cooking again. At the end of the interview Esther and Steven had realised that they could play a role in solving their own cooking situation at school. Steven had realised that they needed to cook again and that they should not wait for a chef, whereas Esther had come to the conclusion that cooking was suboptimal, but it was better to start cooking again than to be hungry. Additionally, Esther had come to the conclusion that boys had to be integrated more in the cooking process so that everyone would have the same workload. Both children were active, not passive, about their stance on the matter. The point is not that they came to the solution that they wanted to start cooking again, the importance lies in their independent thinking, opinion formulating and conscious choice of an action.

In the beginning they described the situation as being too dangerous to cook, that there was no kitchen, and that they would miss class. They also said that they cooked at home, that they had cooked at the school before and that they were missing class when they could not eat. They had not connected these descriptions of a situation to their personal experience. They had not connected their own experience or opinion to what was happening at the school. In the interview we did this. We connected the different statements about the not cooking: It is too dangerous too cook, but they also cook at home. There was it no kitchen and thus they cannot cook, but there was no been a kitchen before either. They would miss class during cooking, but they also missed class when they are hungry. The point here is not to value one argument more than the other; the point is the juxtaposition of the arguments and to formulate an opinion on them. Slowly through the conversation both students create their own understanding of a situation, their role in it and which role they want to play in it.

In the months between June and July, Steven, the student from the interview intercept above, assembled all students in a plenary meeting and called for a debate on the school feeding challenges. They reached the conclusion to submit a request in the headmaster, reflecting the statement he made in the interview, in the name of all students, that they wish to start cooking again and did not want to wait until the

school had built a kitchen or employed a chef. The headmaster has a box at his office, where children can put in ideas and suggestions. The headmaster took this request further and presented it to the parents, who accepted it. In July 2014 the children were cooking again (Follow up interviews 30.08.14 and 15.09.14).

Now it was the boys and girls that were cooking. They cooked again three times a week for all children at the school. It was a group of six, from either Standard 5, 6 or 7 who would be cooking. They were rotating, so each time a different Standard and different children were cooking (Follow up interviews 30.08.14 and 15.09.14). I will elaborate on the process in chapter 6.3 "Improvement strategies for Kibuko programme".

FINDINGS PART II

6 Findings and Analysis

The previous chapter tells the overall story of the research, whereas this chapter zooms in on specific findings answering three specific questions.

Q 1) How does the Kibuko programme work?

Q 2) How does the Kibuko programme impact the children's education?

Q 3) How can the education of Kibuko primary school children be improved?

6.1 Kibuko programme

I first give a description of the Kibuko programme as it functions and everyday practical organization at school. Second, with help of the stakeholder map with focus on relation between stakeholders, I will analyse the programme organisation. This chapter focuses on Question 1, but some of the findings will also touch on Q2 and Q3.

6.1.1 Kibuko programme

The Kibuko primary school disposes over 17 acres of land and cultivates 15 of it, primarily cultivating maize and beans. Additionally they cultivate some bananas and have some areas, which they use for experimenting with different crops and farming methods. On average they harvest 190kg a year, from which they keep around 60kg for the SFP and sell 130kg to the village. The surplus money covers school expenses. The school committee, the parents board and student representatives are all involved in the decision on how much of the harvest is sold and how much is kept. In general, the children farm around 1 day a week, cook lunch three times a week, take care of the goats every day and have additional farming days on the weekends and during holidays. The students from Standard 3 till 7 work on the school farm, whilst Standard 1 and 2 are too small to work on the farm. Notably all the Standards are eating lunch though.

The school farm comprises agricultural activities and goat husbandry. The school had just received the goats in 2013 and were in process of fully integrating them in the programme, hitherto they used the goats' faeces to make manure. Currently the children on duty for taking care of the goats consume the goat milk. The harvest is stored in a storage house at the school. During the period where the school

had stopped cooking, the harvest was put in a storage facility. It was not used for any teachers' private consumption or selling. The children and parents interviewed told me that they were not worried about having stopped cooking, because it belonged to the children and they had access to it. Figure 6 illustrates the stored harvest.

Figure 6. Storage room with harvest, Kibuko primary school.
Photograph taken March 2014, Photographer: L. S. Jaeckle

Figure 7 shows Kibuko primary school. One can see a classroom building on the top, a small part of the agricultural land of the school, the houses further down are the headmaster's house, the storage facilities and the goat shed.

Figure 7. Kibuko primary school: Classroom building with farmland and storage house and teachers' house in the background. Photograph taken May 2014, Photographer: L. S. Jaeckle

The farming and feeding activities at the school today are very different than previous ones. If everything goes according to plan the school cooks three times a week and the lunches are not remuneration for the children for working on the farm, the lunches are the core purpose of the farming activity. The programme is exclusively for the benefit of the children. The headmaster was very clear on the fact that his job is teaching those children, but hungry children cannot concentrate, so in order to teach them, he needs to feed them and therefore he started the programme.

It is the female students under the supervision of a teacher or a parent, who prepare the food. The food is prepared over fire out in the open, due to the absence of a kitchen. During rainy season the absence of a roof and wall sheltering from the rain makes cooking not only uncomfortable, but impractical. The school does not own cooking tools, thus the children have to bring cooking pots, plates and cups with them. It is the older girls that take rounds in preparing the food on the different days and are mainly in charge of the cooking. Boys might have to assist with getting firewood. The classes continue while the selected girls and boys are preparing the food. The coordination and planning of cooking is done by the teachers, they coordinate the whole procedure from start to end of washing dishes.

Usually the school has a farming day once a week, which is signalled a day or two days prior, so the children are prepared and bring their tools and working cloths. In a collaborative project the parents, teachers, and the children built children sized hand hoes. It is the headmaster who mainly coordinates and schedule the farming days; he assembles all the classes and discusses with them what needs to be done, which Standard completes which task and how much they think they can do. Participatory observations confirm this process as being democratic and the tone of negotiations and organisation being friendly. Figure 8 illustrates the headmaster in the middle of organising farming tasks with two Standards. Some children have already been divided in two different talks groups; the one to the left are ploughing in one section of the farm and the one's to the right are harvesting maize. The one's to the right have a bag for collecting the harvest and the one's to the left have hand hoes. The children could decide what they wanted to do and they were discussing how much everyone had to do.

Figure 8. Headmaster Mloka is coordination students about to do farming work. Photograph taken March 2014, Photographer: L. S. Jaeckle.

The farming schedule is mainly dictated by what needed to be done on the farm, when did the weather allow farming work and when did the school syllabus and exams schedules allow farming time. Classroom activities are strictly prioritised. In addition to one weekly farming day, the school would have farming days on the weekend and during holidays. The parents do not object to this, because they see the value and know that working at school prevents parents from having to pay for food or the children from not

Figure 9. Parents of Kibuko primary school pupils helping out on the school farm. Photograph taken March 2014, Photographer: L. S. Jaeckle.

having less food. When heavier farming tasks are physically too demanding for the children the parents help out, such as illustrated in figure 9. The farming, goat husbandry, cooking activities and classroom activities are coordinated, clearly defined and related activities that aim towards a long-term goal of creating a better learning environment for the children – it is an actual programme, not coincidental parallel happening activities. The next section will explain how this programme is organised.

6.1.2 Kibuko programme organisation

I identified the stakeholders and gained understanding of the organisation of the Kibuko programme through the process of drawing the stakeholder map. Figure 10 illustrates the stakeholders map, which systemises and visualises the activities and the stakeholders responsible for those activities.
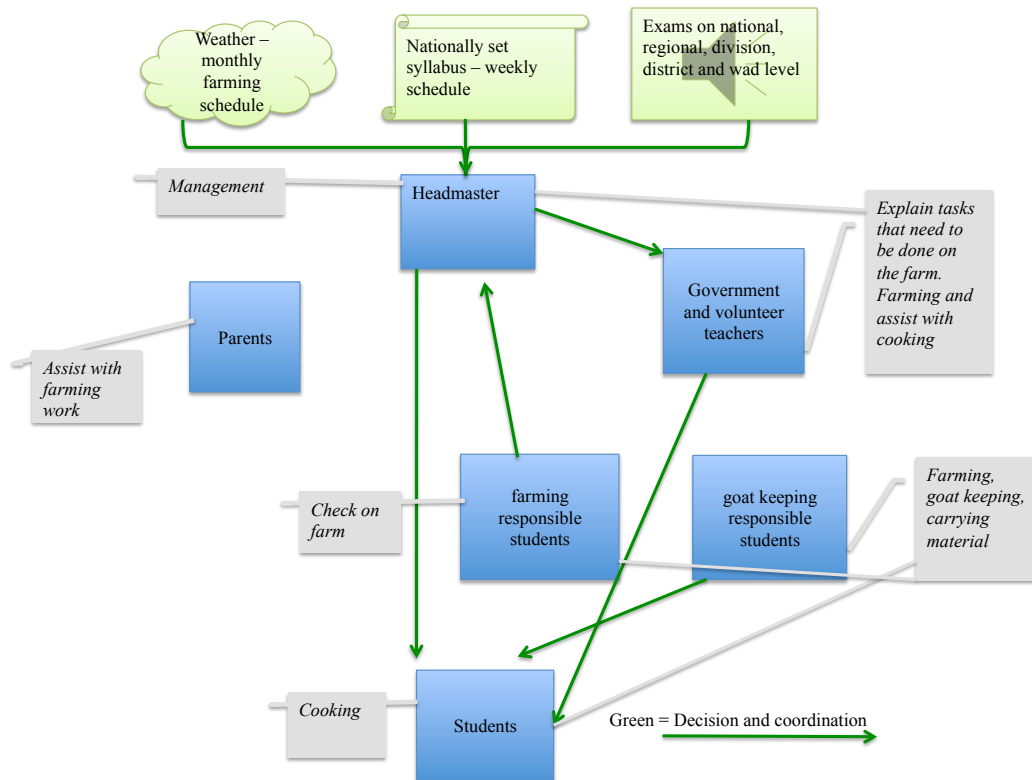
Figure 10. Kibuko programme stakeholder map - simplified version. L. S. Jaeckle, 2016.

In the blue boxes I identify the relevant stakeholders of the programme and in the grey boxes their role and contribution to the programme is identified. The stakeholders are named according to the role they play in regard to the children's education. The students' population for example is divided in three different groups (blue boxes), because they form three different task groups within the overall students stakeholder group. The volunteer teachers and government teachers are together in one group, because they play the same role in the programme. (A new teacher who joins the school, joins this group.)

The model divides between specified and concrete functions/tasks of stakeholders in the square grey boxes and the stakeholders overarching functions in the round grey boxes. A grey line shows, which tasks belongs to which stakeholders.

The arrows represent the systemised relation between stakeholders in correspondence with their role in the programme. The green arrow represents the power and the responsibility of decision-making and coordination over a certain task. The task is indicated in the grey rectangular box. The arrow originates from the group of stakeholders with the power of decision-making and is directed at the stakeholder

group over whom the power of decision-making and coordination counts. The decision making power is more to be understood as task and responsibility, than a ruling power.

Each Standard from 3 till 7 has representatives responsible for the farming. Their task is to check the condition of the farm every day and in case they find something that needs to be done they report it to any of the teachers, who then schedule when and by whom it can be done. For example: the detection of sick plants, the need of weeding or the need to harvest in a section of the farm. The student representatives are always a girl and boy for each Standard. They are selected by their classmates and often are the best students of that class. Likewise, each class has two representatives, who are responsible for the goats. The students responsible for the goats coordinate the cleaning of the goat shed, checking on the goats, preparing water and medicine for the goats and taking the goats out for grazing each morning and bringing them back in again each evening. They choose two new students for these tasks each day, including the weekend and it is the children taking care of the goats who are allowed to consume the goat milk. Participatory observations confirm that children independently show up at the school on weekend days and holidays and take care of the goats. The teachers and parents can be asked for assistance, but the chosen goat keeping responsible pupils in each Standard are in charge. These students also attended a goat husbandry teaching class conducted by the association that funded the goats. Thereafter, these pupils taught their classmates about goat keeping. The children know how to tell if a goat was pregnant, how to feed a goat properly, how to prepare simple medicine and how to prepare the goat milk for safe human consumption.

The organisation of the goat keeping also illustrates how the overall organisation and motivation of the programme works. The children take care of the goats, and they do it voluntarily. When asked if this is not a big responsibility and what is their motivation for all the extra work, they responded:

> "[I]t is great to have this responsibility and to learn about goats. Also, it was a shared responsibility, everyone had to think about the goats and if someone would forget something someone else would remind them. And thanks to this responsibility they have an education in goat husbandry", (Students, interviewed 12.04.14).

The goat husbandry management illustrates parent involvement in the programme. When the programme demands heavier work, the headmaster asks the

parents to assist. Parents mainly contribute by supporting their children in working at the farm. Additionally, they can contribute with manual labour or knowledge. Participatory observation showed that certain parents would pass by the school frequently simply to check out things. One example is a parent, a member of the parent board stakeholder group, passing by the school one day and learning that a goat was sick with diarrhoea and coming back a day later with a home-made remedy. He brought three different plant leaves with him and explained to the headmaster (and my research assistant and me) how different combination of those leaves could be used as medicines. I was wondering about the parents' motivation behind supporting the children to work on the school farm outside school hours, when the parents could use their children's assistance at home. When I asked the parents about their motivation to support the children working and their own contribution, the parents responded that if the children were at home they would help working, but they would also need to be fed and when their children were at school they (parents) did not have to worry about them being fed or doing well. Additionally, the parents represented by both the parents board and the school committee said that all the parents highly valued the agricultural knowledge the children would learn at school.

The primary purpose was to improve the children-learning situation, to enable the pupils to concentrate at school. However, the agricultural knowledge and skills the children acquired through the programme represented the long-term food security and independence of children. Nonetheless, he also wanted to teach the children about farming and give the pupils relevant skills to manage everyday life and struggle. The headmaster, the parents and the children themselves were very clear on that fact that most children leave school and are forced to work after Standard 7. Many drop out even earlier. Working on the farm and taking care of the goats equips pupils with knowledge and skills for their life.

The section above describes the overall idea of the programme. We needed to examine the organisation of the programme more deeply, if we want to understand, discuss and improve the programme. The map pictured above was the basis for this discourse, used both as a method to increase the stakeholder's awareness of their programme and to illustrate the model of the Kibuko programme. The map underneath is the fully developed stakeholder map of the programme and the result of this process.
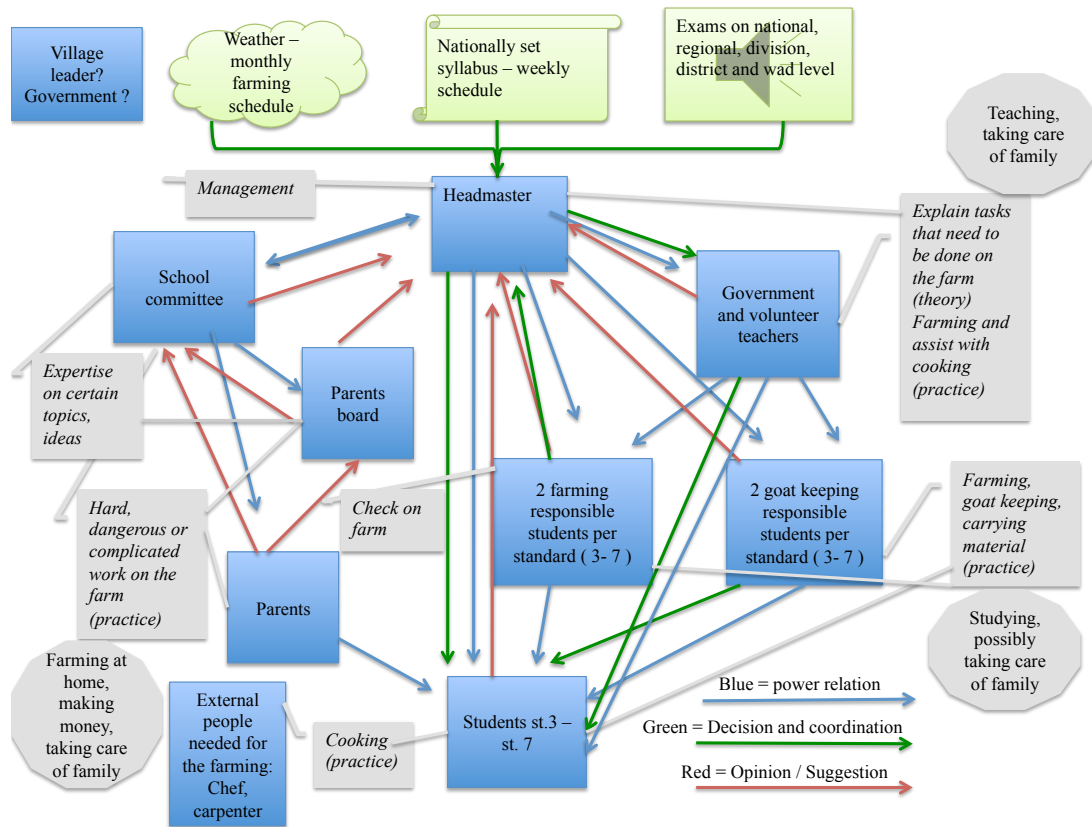
Figure 11. Kibuko programme stakeholder map - simplified version. L. S. Jaeckle, 2016.

The blue arrow shows the usual communication channel when things need to be organised and the decision-making power regarding the organisation of the programme between the stakeholders. The blue arrow often runs parallel to the green arrow representing the decision-making and coordination power. This is a fine differentiation between decision-making and coordination power and communication power. The green arrows represent the responsibility of coordinating and certain decision-making power to complete the assigned task. The blue arrow represents the formal hierarchical power in the programme. As such the teachers can tell the students what to do, but the students cannot tell the teacher what to do.

The parents board and the headmaster both do not have any defined power over each other and stand in a sort of neutral power relation to each other. The parents board's raison d'être is to support and help out with manual labour when the programme needs it. Whilst the parents board is formed voluntarily by motivated parents, the school committee is an institutionalised and mandatory board by the school. The school committee and the headmaster have a two sided arrow, because they both have power over each other in respect that the school committee is there to

control the school's activities and are representing the parents voice in a formal way and the headmaster on the other side is representing the school and has the power over the school. If the school committee thinks the programme is damaging the education experience of the children, they can formally complain against the school. However, this power relation is only active as long as both parties are interested in the beneficial education and school experience of the children. If one of the parties does not care about the children's education the power relations are abrogated.

The red arrow represents the task and duty to report and typically it originates from a stakeholder group that is hierarchically lower than the stakeholder group at whom this arrow is directed. This reporting channel creates a power balance within the decision-making power hierarchy. In an example, it is the headmaster, who coordinates and delegates the farming activities, (this is represented by the green arrow), but it is the students responsible for farming, who report what needs to be done on the farm to the headmaster and have the daily responsible to go and check on the farm. When the headmaster suggests a farming day, the students have the possibility of suggesting to the headmaster that they should not harvest on this day, because they need this day in order to prepare for an exam (this is presented by the red arrow). The headmaster is hierarchically higher and makes the final decision. This final decision can be contested by all other stakeholders (all expect the external stakeholder are connected to the headmaster by a red arrow). Thus, for example the school committee or as well as the students representatives of the different classes. The parents and the parent board can contest this decision also, however they have to go through the school committee. It is only the school committee that has the "equal" power as the headmaster (represented by the blue arrow going in both direction), thus it is up for the headmaster and the school committee to make a decision. As noted before, this power relation between the headmaster and the school committee only exists as long as both are interested in the children education experience.

The government and the village leader are identified as stakeholders, because they are both responsible for the education sector in Kibuko village and accordingly should play a role financing the school and a SFP. The question mark behind their names illustrates their hitherto inactivity.

The yellow boxes represent the external and physical framework of the system. These are connected to the headmaster by a green line. The green represents the influence on coordination and decision making process of the headmaster. They are linked to the

headmaster, because these external factors influence the headmaster in his decision making process. The cloud form visualizes the physical conditions for farming; the weather dictates when farming is at all possible and when not. The box shaped as a papyrus roll represents the national curriculum. The school had to comply with national set syllabus schedule to prepare the children for exams. The box visualised with a speaker representing events set by the education sector, which influence the weekly farming and syllabus schedule additionally. The school receives letters notifying them of the date and location of different exams and duty the school has to fulfil. These events are numerous and mandatory and take priority over both farming and teaching schedule.

6.1.3 Discussion and summary of Q 1) How does the Kibuko programme work?

This section discusses some core characteristics of the model and the consequences of them for the functioning of the model. Despite the many numerous stakeholders in the programme, the programme was not organised by a rigid distribution or control mechanisms of tasks. The programme efficiency was marked by a high degree of teamwork, power sharing, communication and trust between the stakeholders. At any instance, a student or a parent could suggest that something needed to be done, which allowed a highly collaborative approach to the management of the programme. The numerous channels of communication allowed an easy, fast, efficient and continuous communication; when the headmaster was absent for example the communication would still flow. Despite the headmaster playing a central role in management of the programme, the programme is set up to work on the collective of forces and not via a key person.

There is a certain hierarchy, however the hierarchical power has the purpose of organising the programme, rather than overpowering people. No stakeholder actually has to follow an order in relation to the programme. The general agreement and compliance with the different allocation of power and tasks are based on a voluntary basis and a common interest of improving the children's educational experience. The stakeholders agree to a social contract. All stakeholders contribute to the programme in the way explained by the model and get an improved educational experience for the children in return. (The exact nature and degree of this improvement is analysed in the next chapter.) Conditions necessary for the social contract to hold are that stakeholders believe that the programme can improve the

situation and that the situation needs improvement. The programme's success is thus elementary for its continuation. This social contract is the foundation of the system and is both the strength and point of vulnerability.

This social contract between stakeholders is keeping the programme together. There is not an institutional foundation or authority that underlies the system. It is a strong foundation, because how covered in chapter 5 the programme continued to farm and cook before exams even though it was questioned, the programme proves resilience. The same event that indicates the programme's resilience also illustrates its point of weakness. As soon as some of the stakeholders – in this case some of the parents – stop fully supporting the programme, it starts to crumble. The school cannot force the children to cook, when parents question the safety and appropriateness of the cooking. The programme runs on no resources and wants to make food through everyone's contribution of labour and money. It is dependent on the sum of all forces.

The programme's organisation or functioning is not based on an authoritative hierarchy or control mechanism. Nonetheless, the programme runs around one person: the headmaster. There are 14 arrows that point from or are directed towards the headmaster. He might not have an authoritative power, because the system is based on a social contract that can be resolved at any time by any of the stakeholders, but nonetheless the headmaster is managing the tasks and is the key communication person and mediator between parties of conflict. Most of the school related groups are central in the "Headmaster Mloka network" and close to relations he can monitor and manage.

The parents are independent from the headmaster, and they have influence over other groups and institutions with power in Kibuko society that functions outside the "Headmaster Mloka" monitored network. As elaborated above, their support is decisive for the programme. The programme being based on an initiative of the headmaster and the dependency on him and the community resonates with an analysis of farming projects in developing countries by a report from FAO, which states that most school farming programmes are often the result of particularly dedicated teacher and or community (FAO, 2014).

Additionally, the head teacher of Kibuko programme school, who introduced the programme to the school, had experience with Nyerere education of self-reliance and talked about having participated in the previously Nyerere school farming teacher education. The head teacher said the knowledge and the experienced gained through

this course helped him organise this programme. I think both the headmaster's experience in running a school farm and the general historical experience of the country of school farming facilitates the programme, because it is something the parents and the teachers know of and had experienced. Since the primary school of Kibuko was founded, there has continuously been some sort of cultivation activity and school feeding framework on the school ground. Even when both farming and cooking was not done with the purpose of improving the children's education and school experience in the past, it was still done and as such its possibility was proven.

The head teacher himself reasoned the success of the programme with Tanzanian community culture. Tanzania is a community-focused country where people watch out for each other and help each other, thus for him it was evident that the community should join forces in order to allow the children a good education. The community based culture in Tanzania certainly added to the realisation of the programme, however I understand the personality of the headmaster and the actual need for a change to be decisive for the initial start and the continuation of the programme.

Moreover, the surrounding food insecurity, poverty, poor education outcomes and absence of government sector funding for education creates a fundamental need for an improvement of the situation, and as such builds a pre-condition in terms of creating the need and motivation for the programme.

The programme for example "only" cooks three times a week and can "only" generate a little income for the school, but if it was not for the programme, there would be no food at all and the parents would have to pay even more school fees. The interview with the children (see chapter 5 Story of the students) reflects the interests in food and education, and the necessity for the children to eat food in order to learn clearly. Moreover, the children are aware that the majority of them will not continue school after primary school and thus will be dependent on making their own food and generating their own income, thus they are eager to acquire farming skills. The parents said that the children are getting fed at school and that is big enough incentive for parents to let children work on the school farm and additionally contribute with work themselves. Farming is omnipresent and the basis of life for almost everyone, thus farming is an activity that harmonises with the context. The programme corresponding with the cultural, social, and economic context of Tanzania is a facilitating, possible necessary condition.

Geographical location, poverty, food insecurity, absence of government, creating the need for the programme on one side, and the disposition and ownership of land, the cultural and historical context, a dedicated headmaster and a social contract enabling the programme on the other side are are all contributed to the existence of the programme.

Now that we know the story of the system, the idea and the organisation of the programme, foundations of the programme starting the programme, we can look at the concrete impacts of the programme.

6.2 Educational impact of Kibuko programme

According to stakeholders of the Kibuko programme, the programme has been beneficial for the children's education and the children's performance at national exams have been continuously improving since the programme's inception in 2012. The official exam results of PSLE confirm this. Kibuko primary schools passing rate at PSLE has not only improved, but it has gone from below the national and regional average to way above it.

The improvement in results is exceptional given the peripheral location of the school and the limited teaching facilities and low number of teachers. Moreover, this improvement happened in the course of only two years. I posit two mutually reinforcing explanations that stem from the feeding aspect of the programme: fed children learn better and children that know they will be fed come to school more often. Analysis confirms this.

Analysis also showed that the beneficial impact of the SFP would have been weaker or nullified if the headmaster[11] had not introduced an organised teaching and learning environment to the school. Also, taking students out of the classroom would seem superficially to undermine the students' learning, however the headmaster ensured that practical activities were combined with the syllabus and that the syllabus was prioritised over farming. In addition, teaching children on agriculture and goat husbandry attracted children to school because children and parents both valued the acquisition of relevant skills.

6.2.1 Educational performance of pupils

Educational performance is measured by the schools' performance at PSLE. Passing the standardized PSLE is the condition for attendance at secondary school, yet it can only be taken once. A student's performance at the PSLE has a great impact on the students' future, therefore primary school focus on preparing pupils to pass PSLE.[12]

In regard to the central role of PSLE in the child's education, an investment in the children's education should therefore translate into an improved performance at the PSLE for the children to truly benefit from it. Here, the investment in children's

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[11] Unless specified differently, I am always referring to the headmaster, who introduced the Kibuko programme when I say "headmaster".
[12] More information on PSLE and Tanzanian school system can be found in chapter 2.

education is in form of the Kibuko programme. If the Kibuko primary school children's educational performance improved since the inception of the programme, this should have translated into an improved performance at the PSLE.

It is the passing of PSLE that is a major challenge to the whole Tanzanian educational system, thus I will concentrate on the passing of the exam rather than the grade with which the students pass the PSLE. Educational performance of the school is measured by the percent of children passing the PSLE. Increase in passing rate – compared to previous years - is an indicator for an improvement in children's educational performance.

Underneath is a table with the official results of Kibuko primary school from 2010 to 2014. These are sent to the Kibuko primary school from Mvomero district, which is the responsible education office for Kibuko primary school. An external examiner is responsible for the execution and corrections of the PSLE. This ensures a degree of objectivity and that the teachers cannot temper with the results. These results can therefore be expected to represent the students' actual performance.

Table 4
Primary School Leaving Exam Results

Primary School Leaving Exam Results 2010 - 2014	
Kibuko Mgeta	
Year	Selected for secondary education
2010	43%
2011	NA
2012	24%
2013	69%
2014	84%

Note. Data for 2010: Adapted from Kibuko Primary School PSLE transcript sent to Kibuko primary school by Mvomero district, viewed May 2014 at Kibuko primary school. Data for 2012-2014: Adapted from online data base from MoEVT, Basic Education Statistics in Tanzania 2004-2008, by United Republic of Tanzania: Ministry of Education and Vocational Training (MoEVT), 2008, http://www.necta.go.tz/psle_results.

The table shows the percentage of students in Standard 7 at Kibuko primary school, who passed the national PSLE, taking place in September every year (NECTA, 2016). Numbers from 2011 are unfortunately missing. The results strongly support the headmaster's claim that educational performance has improved since he initiated the

programme in 2012. It was in February 2012 when the current headmaster came to the Kibuko primary school and end of 2012 when the programme was developed enough to start regular cooking. The headmaster used the period between February and November 2012 to create a relationship of transparency and trust between the school and the local community, and to initiate the programme and bargain with the parents over the implementation of the programme. Indeed, by 2014, 84% of students passed the PSLE compared with just 24% in September 2012 (See Table 2).

The short time frame in which this transformation took place is remarkable. Within the first year of the programme's inception, the passing rate of the PSLE doubled. In 2013, 69% of pupils passed the exam, compared to 24% in the previous year. The degree of the improvement is equally remarkable. The passing rate of Kibuko primary school is higher than the national average PSLE passing rate, which was 51% in 2013. This suggests that the programme did not just improve the schools performance rate from low to average, but provided additional improvements beyond the norm. These results strongly suggest that the Kibuko programme fulfilled its goal of improving children's educational performance.

Before the relation of the programme and the children's educational performance is analysed, the results of Kibuko primary school are further contextualised in order to understand how high and how unique they really are. For this I compare Kibuko primary school's PSLE passing rate with the district average passing rate and the neighbouring school's average passing rate.

The comparison with the district is important to determine if Kibuko primary school's improvement is 'only' part of a general improvement in the district and area or unique to Kibuko primary school. The district-passing rate for PSLE in Mvomero was 61% in 2013, and 66% in 2014. The passing rate for PSLE of Kibuko primary school was 69% in 2013, and 85% in 2014. The results show that there is a general pattern of improvement at the district level. This means the improvement is a general trend and thus the improvement in Kibuko in itself is not exceptional.

The degree of the improvement of Kibuko primary school is however exceptional. Kibuko primary school's passing rate is higher than district average. Moreover not only the rate, but also the average passing grade of the students improved at the Kibuko Primary School (See Table 2). Thus, there is a higher

percentage of students that passed the exam and they passed it with higher grades[13].
The figure bellow shows a summary of Kibuko primary schools evolution of PSLE
from 2013 to 2014.

Table 5
Primary School Leaving Exam Statistics Kibuko Primary School

REGION : MOROGORO, DISTRICT : MVOMERO		
School Performance Table		
SCHOOL NUMBER : PS1106-028	YEAR 2013	YEAR 2014
Students Enrolled for Exams	39	31 ⬇
Pass Rate(in percentage)	69%	84% ⬆
District Rank	53	40 ⬆
Regional Rank	161	97 ⬆
National Rank	2989	1916 ⬆
Average Mark	120.13	139.1 ⬆

Note. Retrieved from online data base from MoEVT, Basic Education Statistics in Tanzania 2004-2008, by United
Republic of Tanzania: Ministry of Education and Vocational Training (MoEVT), 2008,
http://necta.go.tz/brn2014/home.php.

Neighbouring schools facing similar geographical and socio-economic
conditions as Kibuko and therefore similar teaching conditions are not experiencing
the same improvements or high passing rates as Kibuko. Lukunguni primary school
for example had as few as 18% of students passing PSLE in 2013 and 21% in 2014
(NECTA, 2016). The primary school in Lukuguni has a low student/teacher ratio[14],
faces hunger problems during school hours, struggles with financing the schools
expenses and is located in the periphery of the Uluguru mountains, outside of the

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[13] The students can score a mark between 0 and 250 at the PSLE. Kibuko primary school's average mark increases
from 120 (which is categorised as a C) in 2013 to 139 (which is categorised as a B) 2014. MOEVT. 2008. Basic
Education Statistics in Tanzania 2004-2008. United Republic of Tanzania: Ministry of Educational and Vocational
Training (MoEVT).

[14] In 2013 and 2014 Kibuko primary school student teacher fluctuated heavily and continuously between with 1:44
and 1:160. I choose the lowest and the highest student teacher ration to represent the average. Lukunguni primary
schools student teacher ration is more stable, but equally low with 1:40 as average in 2013 and 2014 Headmaster
Lukunguni, interviewed 08.03.14). In 2012 the school had two teachers when the current headmaster Mloka took
over, but the number of students is unknown – based on the other years total number of students one can assume
the there were between 250 and 320 students.

proximity of public transports or bigger market[15] (Stakeholders Lukunguni primary school, interviewed 07.03.14 and 08.03.14). Two differences are that Lukunguni is located even more remotely than Kibuko and has a more stable and slightly higher student/teacher ration than Kibuko.

Appendix (1) shows the list of the PSLE results of the primary schools located around Kibuko. Some examples: Masalawe had 6% in 2013 and 15% in 2014; Kikeo had passing rate 6 % in 2013 and 25% in 2014 – they are located between Lukunguni and Kibuko. Tchenzema primary school, which is located a bit closer to a centre than Kibuko, had 28% passing PSLE in 2013 and 50% passing the PSLE in 2014. Nyandira village is defined as centre here. The general district wide trend of improvement from 2013 to 2014 is reflected in these results. The results also show a pattern of schools passing rate at PSLE decreases with increasing distance from the centre. This suggests that the teaching conditions decreases with increasing remoteness.

The results of Kibuko primary school however do not match this pattern, they are higher than the results of neighbouring schools, which due to their closeness to a centre are expected to have better teaching conditions. This means that Kibuko primary school PSLE results are indeed exceptionally high.

According to the stakeholder groups of the parents board, school committee and volunteer teachers, the previous headmaster and his school regime was harmful for the students. Ending this era can be expected to have an improving impact on school performance by the simple absence of these previous harmful conditions. However, Kibuko primary school would not be expected to exceed the district average. The Kibuko programme was set in place by the headmaster in order to improve the poor learning conditions, and the results suggest that the programme succeeding in doing so. The degree of the improvement and the short time frame within which it took place are exceptional compared with the district and the neighbouring schools. The following section will present the findings on how the Kibuko programme has impacted the education of children in various ways.

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[15] Data from Observation and interviews with headmaster and teachers, students, parents of Lukuguni primary school and village leader of Lukunguni, interviewed 07.03.14 and 08.03.14.

6.2.2 How the Kibuko programme relates to children's education

Kibuko primary school's PSLE passing rate improvement cannot be explained as a consequence of a district and national trend. The national PSLE is a nationalised standardised exam. Therefore a possible variety in the exam content and demands cannot explain a variety in the results of the exam. Thus the difference in the PSLE passing rates has to be explained otherwise.

Considering occurrence of the inception of the Kibuko programme and the improved students performance at PSLE within the same period of time, it seems likely the two phenomena are related. The following section will elaborate on how the Kibuko programme and the students' performance at PSLE are related and argue why the programme can be accounted for the change.

According to teachers of Kibuko primary school, when students receive food at school it improves their attendance, cognitive behaviour and school performance. This is in accordance with a comprehensive survey on SFPs and research which state that SFPs typically increase school attendance, improve cognition and educational achievement of students (Bundy et al., 2009, Pelican and Florida Citrus, 1982).

6.2.2.1 School attendance

School attendance refers to the time a child is attending the mandatory classes thus the more classes a child attends the higher is his/her school attendance. The parents, the children and teachers said that during the days lunch was served the school attendance was significantly higher than on days no food was served. Hunger makes children leave school or not show up. When the school does not serve food many children leave over lunch and do not return to school after. One in four children live too far away to go home over lunch and four in five children do not have lunch with them (Workshop, 05.04.14). When the school was cooking regularly, school attendance was higher in terms of number of days per week and hours per day a pupil attended school. This finding is supported by the fact that when the school stopped cooking in January 2014 the school attendance of the following months went down again. This suggests that the alleviation of hunger through lunch meals incentivises pupils to come to school and stay at school.

The school does not have the time or staff to keep records of the attendance of children during the day. As a consequence the attendance lists do not capture children leaving during day. I did not have the means to make an attendance list which had

reflected the real attendance of students. Therefore no attendance list can be used to confirm or disconfirm the teachers' and pupils' statement. The teachers and pupils' observations and experience are used as source of data. Based on the fact that the students and the teachers are the once experiencing the hunger and its implications five days a week every year, I consider them experts of this situation. Furthermore considering that the teachers mentioned the attendance going down without me asking about it and the children being able to explain to me how food and school attendance is correlated I consider their account of the relation of hunger and school attendance reliable. Teachers are in fact admitting that they do not see a point in teaching when children are hungry and children are admitting to skip school.

The parents said they supported children going to school more strongly when they knew their children were being fed, because then the parents did not have to worry about it at home. An increased support of the parents to send children to school most probably increased children's attendance at school. This interpretation resonates with literature: analysis of impact SFPs serving school meals shows that school meals increase school attendance by creating an incentive for parents to send their children to school (Bundy et al., 2009) and that it motivates children to go to school and stay at school during the day (Bundy et al., 2009).

The serving of meals as part of the Kibuko programme thus increases children's school attendance. The attendance increasing impact of serving food at school is a causal mechanism that explains a part of an increase in students' performance. Children's school attendance alone will not suffice to improve children's performance, however the students' attendance in class is a pre-requisite to learning.

6.2.2.2 Enrolment

Likewise the attendance, the enrolment of a child in school is a pre-requisite to learning. Enrolment (Standard 1 till 7) rates of Kibuko rose from 308 students in 2013 to 323 in 2014. This confirms an increase in the enrolment after the first successful year of conducting the programme. However, enrolment rates can be expected to vary from year to year due to different numbers of births in a year, due to a better harvest and consequently more parents being able to afford children in school or families moving.

According to the headmaster the parents of the pupils from other villages liked what the Kibuko primary school was doing with the programme and preferred to send their children to Kibuko primary school even though this required children to walk further. The increased enrolment numbers of one year cannot confirm such a pattern. However, the increased numbers in combination with the enrolment of students from neighbouring village do show that the Kibuko programme activities resonate with the demand to a school of the area to a certain degree. The increased enrolment rates show the popularity of the Kibuko programme - and an increasing number of enrolled children means a potential increased number educated children in general - but higher enrolment numbers do not explain the internal positive educational impact of the Kibuko programme.

6.2.2.3 Cognition

The parents, the teachers, and the children all defined the relation between hunger and education as problematic. Based on teachers' and pupils' experiences, pupils being hungry during class impacts teaching and learning conditions negatively. One teacher said that on days where no food is served, there is hardly any point in teaching in the afternoon, because children are too tired, too apathetic or fully asleep and consequently cannot follow, participate or learn anything in class. The teachers blame the pupils behaviour on being too hungry and not on a lack of motivation or willingness. My observations and interview confirm that children fall asleep in class, are not concentrated, and apathetic, because they are suffering from short-term hunger. The children arrive at school with growling stomachs. The students confirm this description of their behaviour and condition. Likewise, the pupils describe how much easier it is to follow class when they have eaten. The students specify that on days, where they eat lunch at school it is easier to follow the class and that they remember more afterwards.

Indeed, as considerable research has demonstrated, hunger harms a child's cognitive abilities (Amcoff, 1980b, FAO, 2014). Likewise an alleviation or decrease in hunger improves a child's cognitive abilities and can lead to improved academic achievement (Bundy et al., 2009).

An out-of-house SFP serves one or two meals per school day, whereas the Kibuko programme "only" serves food three times per week and before exams. Despite the less frequent meals, one can still expect the meals to have an impact. This

because the simple alleviation of short-term hunger improves a child's learning and performing ability (Del Rosso, 1999, Grantham-McGregor et al., 1998, Simeon, 1998). This means that every time food was served, the children's short-term hunger was relieved, and consecutively they were benefiting from an improved cognition, thus learning, and performing better in the hours after a meal. The performance increasing mechanism is the alleviation of hunger (Simeon, 1998).

Taking this performance improving mechanism as a departing point, I consider the school feeding part of the Kibuko programme to be the origin of the improvements of students' performance at PSLE in 2013 and 2014. Thanks to three weekly proper school meals the children were able to concentrate and follow and remember more from class at least three days a week. Three days it not optional, however it is significantly more than zero days a week. Prior to the Kibuko programme, the school would only occasionally cook on the days the children were working on the farm and, according to the children and parents, the food was a lot less frequent and did not suffice to satisfy their hunger.

Considering the increased hours of improved performance, especially for the children suffering from short-term hunger, the overall achieved level of understanding of the syllabus is likely to have increased as well. This means the pupils would master more of the syllabus that was to be tested at the PSLE. Because of meals before exams the children were able to reproduce what they had learnt.

The alleviation of hunger influences a child performing ability promptly, therefore serving a meal before the exam improves a child's cognition and performance, no matter if the child has benefitted of regular meals before that. The alleviation of hunger enables children to concentrate and perform during the exam. The cooking before exams cannot contribute to children actual knowledge and exam preparation – the meal has nothing to do with the actual knowledge and skills the children have to prove at the PSLE. However, it allows them to perform at their best. The former headmaster did not organise cooking before exams, which means the majority of children would attend exams hungry. Consequently, a part of the improvement can be attributed to the children being able to perform at the exams.

The SFP of Kibuko programme attracted more children to school, it allowed them to stay at school and improved their cognition and consequently created the basis for improved learning and better performance at the exam. An improved performance at PSLE is not surprising, but a logical consequence.

6.2.2.4 2014 results

The PSLE results from 2014 are higher than 2013, even though the lunch programme was stopped for four months in the 2014 school year. The 2013 batch scored 69% and the 2014 batch scored 84%. The halt in the cooking with the simultaneous absence of an alternative provision of food must have had a negative impact on the children learning ability. Nonetheless, this loss of learning time did not translate into a decrease in educational performance at PSLE.

The explanation for the limited impact of the halt in the cooking on the children's performance at PSLE is fourfold: Firstly, the PSLE exam does not only test the classes taught in the four months, where the children experience a decreased learning ability due to short-term hunger, but a students general understanding of the taught material. Secondly, the Kibuko programme is still cooking before the exams, which means the pupils are not suffering from impaired cognition due to hunger during the PSLE and are able to perform at their best. Thirdly, four months of potential decreased learning ability due to halt in cooking does not erase all progress made before and after the four months period. This brings me to the last point, which focuses on the overall changes the programme brought, complementary to cooking. The overall environment of the school had changed significantly with the arrival of the current headmaster Mloka in February 2012. Even though the 2014 batch missed four months of school feeding in 2014 school year, overall they had benefited longer from the changed school environment and the school feeding than 2013 batch. When the 2013 batch took the PSLE, the school feeding part of the Kibuko programme had been running for one semester and the new headmaster had been present for three semesters. When the 2014 took the PSLE, the SFP had been running for three semesters and the new headmaster had been present for five semesters. Considering these four points, it is less surprising the 2014 PSLE results are higher than the year before, despite the school cooking less in 2014 than in 2013.

6.2.2.5 Teachers and classroom organisation

In addition to the cooking programme, the improvement of the pupils' school performance can be associated with the changed environment and pedagogy at the school. Research on impact of SFP found that the impact of food on children's classroom concentration can be limited by an disorganised classroom (Grantham-

McGregor et al., 1998, Chang et al., 1996). This implies that the food was necessary but not alone sufficient for the improvement in results.

In chapter 5 Story of the research the change of the general school environment between the previous headmaster and the current headmaster was discussed. The termination of the previously harmful and exploitative environment and substitution of the later with a learning focused environment certainly improved the teaching and learning conditions at Kibuko primary school.

The headmaster did not only introduce the Kibuko programme, but he also introduced a whole different pedagogy at the school. The new learning environment engenders trust and teamwork between teachers and students. This is a big change from the abuse and exploitation that characterized student teacher relations in 2012. During the period of this study, the interaction between teachers and children was kind and respectful. Field observations of two and a half months confirm that the teachers cultivate a respectful and kind tone and behaviours with the children and that children feel comfortable talking to them. For example during interviews, the children would feel comfortable to come in and ask the headmaster if they could leave their bag at his office or if they could have some chalk and use one of the classrooms. The school is focusing on making the students succeed at the PSLE and treats them well.

The improved finances and support from the parents allowed the headmaster to improve the learning environment further. The teachers' salary remained relatively low, and the teacher-student ratio fluctuated significantly, however it was improved by the employment of volunteer teachers. It was the improved relationship between the headmaster and the community that allowed the headmaster to employ volunteer teachers. Volunteer teachers are paid through parents' school fees, thus the parents need to believe the headmaster and school have their children's best interest at heart in order to agree to pay school fees. With the income produced through selling the harvest, the school was able to share the costs for volunteer teacher and pay for other school expenses. The student/teacher ratio is still extremely low and fluctuating and the schools struggles with poor teaching facilities. Yet, the situation is improved and an improvement of learning conditions – even if only slightly - is presumable.

6.2.2.6 Possible negative impact of non classroom activities

The time spent farming and cooking could have a negative influence on the school environment and learning in terms of taking valuable time away from the

classroom. The school even stopped its regulated cooking for a four months period because parents questioned children using time for cooking instead of being in the classroom. The prompt and strong improvement in PSLE following the inception of the programme, did however not suggest that.

Several things need to be considered when talking about valuable classroom time that could be lost through farming. There are not enough teachers or classrooms to teach all seven Standards at the same time, thus a Standard working on the farm or cooking does not necessarily correlate with students missing classroom time. Moreover, a lot of the farm work is done outside the classroom time with the specific purpose of not interfering with classroom time.

Furthermore, the farming is the source of the food served at school, which is improving learning condition by alleviating hunger. Farming is also a source of income to the school, which pays for volunteer teachers and school utensils, also improving learning condition. Children's involvement in farming affects students positively through improving their learning conditions, yet simultaneously it affects them negatively by interfering with classroom time. The two have to be weighed against each other. The improvement since the inception of the Kibuko programme is so extreme, that children spending classroom time on the farm cannot be classified as harming their educational performance.

In addition, all stakeholders said that children learning about farming and acquiring life skills and future self-reliance as one of the three main purposes and benefits of the Kibuko programme. The children themselves see the future-self-reliance, which according to the children is the result of the farming skills that they acquire in the Kibuko programme, as the main benefit of the Kibuko programme (Workshops 05.04.14). This means the stakeholders themselves weighed the benefits of the farming more over its challenges.

6.2.2.7 Practical learning

School farming activities are attributed to have potential educational impacts by providing an active learning ground by linking agricultural activities to curriculum subjects (FAO, 2014). The headmaster was convinced that it was beneficial for children to test and experiment with their knowledge by applying it on the farm. The school linked the classroom and farming activities in two main ways that according to the children themselves benefitted their learning process. 1) The teacher connects

exercises in class with the farming activities. 2) The teachers have the students apply their classroom knowledge for executing farming activities. An example of the latter bellow:

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2) "The teachers have the students apply their classroom knowledge for executing farming activities."
Interviewer: "Do they remember how exactly it was done?"
Students: "Yes. They had to measure 6 cm between each hole and then put three maize seeds in each hole.
  ○_____○_____○_____○_____○_____○_____○""

This is an example of an interview where I asked the students if they had ever had a classroom lesson in the field (Students, interviewed 12.04.14). One example was on the planting of maize, where they had the mathematical exercise of measuring the distance between each hole where they would put the maize seeds in. This example concretely teaches children on mathematics and agriculture.

Applying the theory through actual farming allows students to process, understand and memorise the theoretical knowledge better (Msuya et al., 2014). When asked if the children appreciate linking practical activity with theoretical exercises, the children say clearly that it is easier to solve a math exercise that is linked to farming activities that they can relate to than so solve a math exercise in an abstract setting.

This is one of many examples linking farming activities, knowledge and skills with the classroom. These classroom sessions in the field were frequent. The students were able to give me various different example of how the farming had been used as a classroom.

In addition, considering the farming ground being used as a practical learning platform and the exercise in class being combined with farming experiences, the learning environment can be classified as innovative and inspiring. These findings supports the argument that the overall learning environment of Kibuko primary school was improved and thus contributed to an improvement in children's educational performance.

FAO implements school garden programmes with the educational objective of improving children's access to education "by attracting children and their families to a school that addresses topics relevant to their lives" (FAO, 2014, p.5). The parents of the school committee and the parents' board said they highly appreciated the farming

education the children received at the school and therefore valued the school as a whole. The parents representatives said that generally parents supported their children going to school more since the new headmaster had started, because they saw a value in what children learnt at school (Workshop, 05.04.14). The school teaches relevant subjects for the parents and the children, which makes the school more relevant for parents and breaks the isolation between the parents and the school.

The parents show conflicting opinion on the children involvement in the Kibuko programme in terms of valuing the children receiving food and acquiring agricultural skills and knowledge, yet demanding a halt in the cooking. This will be discussed in the next chapter.

6.2.3 Summary of Q 2 How does the Kibuko programme impact the children's education?

Educational performance results and analysis of the impact Kibuko programme has had on children's educational performance suggest that the Kibuko programme has had a beneficial impact on children's education. Students' performance at the PSLE exam has improved exceptionally since the inception of the programme.

The educational impact of the programme is three fold. 1) The children learning ability is improved through and improved cognition, benefits of practical learning and improved learning environment in general. 2) The children's access to education is improved through the increased attendance due to provision of food at school and due to an improved learning ability. The children's access to education possibly improved because the programme brought parents and the school closer to each other, resulting in parents supporting children going to school. 3) The children's possibility for further education are significantly improved due to more children passing the PSLE, which allows them to continue to secondary school. Based on the analysis above, the improved PSLE are the result of an increased performing ability during exam due to alleviation of hunger before exams, and the increased learning ability and increased access to education since the inception of Kibuko programme.

6.3 Improvement strategies for Kibuko programme

The objective of this AR is to improve the education of the Kibuko primary school pupils through improving the existing Kibuko programme. The objective in terms of improving the children's education through improving the Kibuko programme is only a "valid" objective to pursue for me when three conditions are full-filled; prior analysis shows that the Kibuko programme has been beneficial for children's education, has not harmed the stakeholders in the process, and has potential for improvement. The guiding question of this chapter is question 3: *"How can the education of Kibuko primary school pupils be improved?"*.

Analysis suggests that the programme has indeed been beneficial for the children's education, has not harmed the stakeholders and has potential for improvement. Furthermore analysis has shown that developing the connection of classroom and farming activities further would bear potential of educational benefits associated with practical learning. However, analysis also revealed an interim halt of the regular cooking. At the time of the research (February – May 2014) the school did not cook lunch meals during normal term-time, which increased the children's exposure to short-term hunger during school hours again. However, the school was still cooking before major exams. For the stakeholder the halt in the cooking and rise in the hunger was the pressing matter. Based on the assumption that the alleviation of hunger is a prerequisite for children learning and performing, I viewed the halt in the cooking as a threat to the Kibuko primary school children's educational success. Thus, solving the cooking situation had the potential to improve the education.

This chapter focuses on two problems which resolving bear potential for improving the children's education. One problem is the increase in hunger due to the halt in the cooking part of the Kibuko programme. The other problem is that the Kibuko programme stakeholders took on a passive role and did not try to influence the "new increase in hunger and halt in the cooking". Both these issues have been touched upon in the earlier parts of the findings. This chapter displays how, with help of AR and the Freirean pedagogy, the stakeholders and I defined, addressed and solved the two problems.

6.3.1 AR offers a problem solving process

AR is often applied to inquire about a problem within a group or organisation, find a solution to the problem, and to implement this solution (Reason and Bradbury,

2008, Johnson, 2002). "Within an action research project, communities of inquiry and action evolve and address questions and issues that are significant for those who participate as co-researchers" (Reason and Bradbury, 2008, p.1). Through following a collaborative, integrating and reflective approach to inquiry and discussion, AR is able to produce knowledge and change, which reflects the community's interest and needs. The collaborative approach allows using the participants as experts and giving them a voice and influence in the output of the research process.

This approach allowed the research community to influence the research and communicate that an increased hunger was the biggest problem and not practical learning. This process prevented the research taking a focus on problems irrelevant to the stakeholders, and thus to come up with solutions irrelevant and alien to the research community and situation. As a result, the stakeholders and I abandoned the initial plan of developing the practical learning dimension further. Instead, the focus shifted from finding an improvement strategy for the overall Kibuko programme to finding a problem solving strategy for the increase in hunger caused by a halt in the serving of meals.

How one understands a problem influences the solution one envisages for it. Therefore in depth definition of a problem and the causes of it is key to solving it (Johnson, 2002). I thus needed to understand the reasons that caused the Kibuko programme to stop the regular school meals. Restarting the school meals was dependent on the premise that the benefits of the school meals would clearly overweigh any possible harm continuation of cooking could bring.

The stakeholder understood four reasons as causing the halt in regular school meals: First, the pupils could get hurt while cooking; second, that pupils missed class while cooking; third, that was too hard to cook without a kitchen. Finally, parents and teachers also pointed out that the general support for the Kibuko programme, and thus also for the cooking, had decreased. The parents explained that some parents in the village were questioning why the community was investing so much time, labour and money in the programme when the government of Tanzania had said that it would provide free school and a free school meal programme. Parents and teachers explained further, that this had not been a problem before and that this doubt spread and had grown since a politician came to town and had advised the parents of the village against supporting the programme. The politicians reasoning had been that it is

the governments' responsibility to provide a school with all necessary facilities, infrastructure and a SFP, not the parents' or children's.

I concluded that the interplay of the negative side effect of the cooking and the fact that the school had become the topic of a political campaign had led to the halt in the regular cooking in beginning of January. In the discussions on generating solutions for the halt in the cooking, I realised that the stakeholders had become passive in this situation. The stakeholders were caught in a limbo between understanding and valuing cooking as *raison d'être* of the Kibuko programme and not cooking, and between being representatives of all parents and their own opinions. They described the Kibuko programme as a programme that was cooking three meals a week, and as increasing the children's access to education, yet they were not actually cooking. Still, the stakeholders maintained the rest of Kibuko programme and stored the harvest in the meanwhile. They continued farming because they wanted to start cooking again eventually. Yet, they were not actively doing anything that would enable cooking of meals. The stakeholders' paralysis was possibly causing or contributing to the stagnation in the situation and continuation of the halt in the cooking from January until June.

When it came to answering my question on how they would resolve the above-mentioned problems and start cooking again, they said they already had a solution: they said they would start cooking again as soon as a chef was hired and the kitchen was finished. However, they had no strategy on how to finance and find a chef and how to finance and build the kitchen, neither was there a dialogue on the matter. In May 2014, the Kibuko programme had started to "crumble" further. Parents and teachers reported a decreased quality and quantity of work done on the farm. Discussing the suggested solutions of building a kitchen and employing a chef, the stakeholders would say that they did not have money or the technical skills to build the kitchen or money to pay a chef. Parents, teachers and students described the situation, the challenges and solutions from the "outside". They did not describe their relation to them or their role in implementing these solutions. I view their passiveness as problematic because it prevented them from influencing and shaping the situation according to their needs and preferences. In addition, their passiveness left the problem unsolved.

My analysis of the situation concluded that the four causes preventing the school from cooking according to the opinion of the stakeholders were "relative". The

students can get hurt while cooking at school, however almost all children cook at home as well. The students who are cooking do indeed miss class, however both the children cooking and the children attending class (while the others are cooking) miss class when they are not cooking due to the hunger they are experiencing. It is indeed hard or impossible to cook without a roof during rainy season, however this "only" counts for the periods it is raining and not for the entire school year. The government is indeed responsible for providing a functioning school and the needed facilities and has promised a SFP, however the government is failing to do so. And presumably that is not going to change soon.

All these reasons are valid and highlight problems related to cooking and the school programme in general. However, these challenges had been there since the programme's inception and were not new phenomena. Furthermore, these challenges had to be weighed against the challenges the halt in the cooking brings forwards. The benefits of the programme that would potentially be lost by a prolonged halt in cooking, were obvious. In addition, the children's education would continue to suffer due to hunger unless the stakeholders themselves provided children with the food, until the government becomes active, until someone builds a kitchen, until a chef is found.

At no point did the meal programme of the school manage to alleviate the hunger every day or during the whole day. Still, provision of lunch alleviated the hunger for the period of time after the meal was served and created an incentive for children to come to school on the day the meal was served. This occurred three times a week, which is three out of five school days where children attended in increased numbers and had an increased learning opportunity. I understand an increased access to education for three days of the week compared with no days a week as an education benefit due to provision of a lunch meal.

In conclusion, the reasons stated by stakeholders caused the halt in the cooking. It had been these reasons that had created doubt towards the cooking and therefore stopped it. These reasons revealed the many challenges that were connected to cooking, yet the challenges appear negotiable. The stakeholders did not describe cooking as impossible. The children had been cooking before. The stakeholders had assumed a passive role in the turn of events, which caused the stagnation in the situation by preventing them to react to the worsened situation.

6.3.2 Shape your history

The stakeholders of Kibuko needed to sort their passive bystander status and to start interacting with their environment as active thinkers and actors, in order to be able to shape their environment. According to Freire, the movement from passivity to activity presupposes stakeholders' awareness of the fact that they can influence their environment. The stakeholders need to understand that they do not have a predetermined place in a system or history, but that they are part of the decision making process (Freire, 2000) .People who take on a passive attitude and behaviour towards the oppression can change their passive behaviour towards an active behaviour through developing a "critical consciousness" (Freire, 2000). In order for the stakeholders to resolve the problem and sort out of the current situation, the stakeholders needed to engage praxis. Praxis as defined by Freire is "*reflection* and *action* directed at the structures to be transformed" (Freire, 2000, p. 126).

In our AR the challenge was to learn what the parents needed in order to take on an active role again with the purpose of facilitating stakeholders participation in their environment. They stated clearly that they viewed the programme as beneficial and wanted to start cooking again; however, they were doing little to solve the problems and begin cooking again

I arranged a workshop (05.04.14) with the pedagogical objective of "critical consciousness", through engaging stakeholders in critical dialogue. I asked the stakeholders to list benefits and purposes of the Kibuko programme in order to prompt them to reflect on how they had influenced their life already. See appendix (2). My request intended to make them realise that they might influence the future life as well. I further discussed with them the problematic that hitherto achieved purposes and benefits would not benefit future generations anymore, unless the programme was continued, (or they found an alternative solution with similar benefits).

6.3.3 How the stakeholders took part in shaping their environment

6.3.3.1 Students

The students left their observing role, where they accepted that they were not getting food anymore, despite the fact of being hungry and food being available. They became active and engaged in shaping their environment. The discussion did not have the objective of convincing them to start cooking again, but rather to promote

reflection on the situation and formulation of an independent opinion on the halt in the cooking and their role in it. In the sub-chapter "Story of the students" (see p. 53), an intercept the discussion with students shows the students' transition from passiveness to active engagement. The cut out shows the students reflecting on their situation, each student formulating an independent opinion, their transition from playing roles as observers in the cooking situation to taking on an active role with the wish and plan on how to influence the cooking situation.

The chain of events following the two workshops held with student representatives' show that the students were able to transfer at least a part of their increased critical consciousness of the situation and their role to their fellow students. They called in a student meeting where they discussed the cooking situation and asked their fellow students if they agreed to start cooking again. The student body decided to start cooking again and successfully demanded the teachers' and parents' permission to start cooking again. In addition, they changed the existing cooking schedule to include boys in order to distribute the missing of classes fairly among the older student population (Follow up interviews 30.08.14 and 15.09.14).

It is a powerful moment when the two students (see sub-chapter *"Story of the students"*, p.53) realise that they have a voice and their actions can have impact. Two students mobilised their fellow students to demand to start cooking again and introduce gender equality in the rotation system of cooking duty. The parents and teachers had to agree to those demands, and they did. Before looking at parents' change of heart, I want to emphasize three elements related to the pupils' demand and offer to cook their own meals.

Firstly, their choice exposes how much the children experience and suffer from hunger. Students chose the hard work of cooking over the hardship of being hungry. Secondly, it shows that the students realised that unless they became active they might stay hungry for a couple of more months or their entire school time. They became aware of the urgency of the situation. Thirdly, it demonstrates how reflection and action are closely interlinked, and how their interplay can lead to emancipation and change.

The AR acted as a catalyst, both by showing students that they could influence history and by offering a platform to exercise their independent critical thinking, which lead to the students being able to come up with their own opinion and ideas of how to realise this opinion. According to Freire (2000), critical consciousness

unleashes emancipatory effects that allow groups to realise that they can shape their environment. In addition, it gives them the tool to decide how they want to shape their environment and allows them to act on it.

> "As the Freirean pedagogical objective, conscientizaçao is intended to promote the recognition that personal and social change is possible by altering the ways we understand, act politically in and upon the world. It recognizes humans as historical beings, whose reflection and action, transform their social circumstances in progressive sorts of ways", (Dale and Hyslop-Margison, 2010, p.147).

Within this logic, the stakeholders' (here the students') realisation and reflection on their role in their history emancipated them: They became aware of their capacity and potential to influence their history. The stakeholders enabled themselves to decide how they wanted to influence history, which again enabled them to plan and execute the envisaged change. The reflecting on past action and current situation released a future action.

6.3.3.2 Parents

Another key element allowing the transformation of the circumstances is the teachers and parents' receptiveness (all parents) towards re-starting of regular cooking and equal distribution of cooking duties between boy and girls. The teachers were not against the cooking, but they could not enforce cooking against the will of the parents (or the children). The parents' representatives, on behalf of the parents, had told the school to stop cooking.

The cooking and the farming activities are outside the formal school requirements and thus school jurisdiction, thus the children needed their parents' approval to cook and farm. The children could only start cooking again, if their parents (all the parents) agreed to it. The parents changed their opinion through reflecting on the disadvantages a prolonged halt in the cooking would have. They ended up deciding that loosing benefits associated with cooking was worse than the negative impacts associated with children cooking. The parents' board and parents of the school committee formed a united front and wanted to start cooking again.

For instance, underneath, one parent reflects on the overall situation and argues for letting the students cook again. She pressed for an immediate solution of the problem, based on her conclusions that the halt in the cooking jeopardised the entire Kibuko programme.

"Students could make their own food while the kitchen is being built. And also, we really need to continue looking for a chef. If there is food everything will be better, because the students will participate fully in farming activities, because they are physically able to work harder. Beans, maize and peas need to be planted now. We need to do this now", (A parent, interviewed 12.04.04).

This statement reflects the parents not only having an opinion, but their opinion being reasoned and connected to an action.

In the last workshop (Workshop 05.05.14), the parents decided to call a parents meeting and try to convince other parents that they needed to act and that the school could not wait for the government to become active. They concluded that the politician might be right in saying that the government promised better schools and a SFP, but that the decisive fact was that the government did not act on its responsibility and that their children needed education now.

The parents as school committee and parents board did hold a parents and village meeting with the objective of convincing the community and parents to understand that the school needed to act on the cooking situation. They succeeded. When the parents received the students' request to start cooking again, the parents were receptive and allowed it. This shows both how reflection relates to action and how the two form each other and depend on each other. Further, it shows how through engaging in praxis the students and their parents can actually transform and shape their history. This resonates with the possible transformative power attributed to critical consciousness: "It (conscientizaçao) recognizes humans as historical beings, whose reflection and action, transform their social circumstances in progressive sorts of ways" (Dale and Hyslop-Margison, 2010, p.147).

6.3.3.3 Data summarising problem solving evolution

The table underneath summarises and sorts the highlights and key results from the workshops and interviews, which were held with the parents and children with the objective of improving the children education by finding an improvement to the increase of hunger at school. Table 4 summarise the stakeholders' evolution from problem definition to problem resolution.

Table 4
Problem solving evolution

Stakeholders	Parents boards, school committee, old teachers	Pupils	Research	Together	Key Interviews & workshop with concrete objective of improving the education situation and concrete results
Define problem	Hunger keeps children from school and impairs their cognition. And hunger decrease amount and quality of farming work, which again decrease harvest and school money generated from selling harvest.	Hunger keeps children from school and impairs their cognition	Hunger keeps children from school and impairs their cognition. Halt in cooking is likely to initiate chain effect of stopping entire Kibuko programme and as such stopping all benefits of Kibuko programme.	Hunger decreases children's access to education.	• Interview with school committee 12.03.14 • Interview with parents board 12.03.14 • Interview with headmaster 24.03.14 and 25.03.14 • Interview with students 12.04.14
Causes of problem	No kitchen, cooking too dangerous for children, children miss class, a part of Kibuko community question righteousness of Kibuko programme.	No kitchen, cooking too dangerous for children, children miss class	Passivity of stakeholders keeps them from defining and following up an action to influence the hunger problem.	All causes mentioned play together	• Interview with school committee 12.03.14 • Interview with parents board 12.03.14 • Interview with headmaster 24.03.14 and 25.03.14 • Interview with students 12.04.14
Discussed solutions (in bold the solution stakeholders chose to follow up on.)	Build a kitchen, employ a chef, wait for government to take on their responsibility, go back to old system of children cooking, **go back to old system of children cooking until kitchen is built and a chef has been found and employed, hold parents meeting and suggest this and point out that government wont come.**	Have classes through lunch break and leave school earlier (instead of having lunch breaks without eating and then pupils leaving school because too hungry), Start later after lunch so pupils have time to go home and return to school again, Not cook and be at class hungry, **boys and girls cook both to distribute classes missed fairly among older students.**	Convince stakeholders of importance of cooking, cooking more important than challenges around cooking, discuss lunch packages, parents cooking, longer morning classes like the children suggested, teachers cook, parents cook et cetera, **engage stakeholders in a critical reflection on hunger situation and solutions with the purpose of them reaching conviction of needing to change the situation by acting themselves.**		• 12.04.14 Interview with on parent (parents board)
Action chosen by stakeholder which will improve situation	Start cooking again and convince parents that children should cook while parents find out how to employ a chef and build a kitchen. This is urgent – they need to act now.	Start cooking again and not wait for chef and kitchen.	Help stakeholder to go from passive player to active players		• Workshop with all stakeholders 05.04.14 (and 04.04.14 and 06.04.14) • Interview with parents (parents board) 12.04.14 • Workshop with parents 05.05.14 • Interview with students 12.04.14
Praxis	A parent meeting with village leader present was scheduled in May. Follow up research shows that agreement that children are	No action was decided with children. Children "simply" decided to start cooking again during the interview. Follow up interview shows that they	Follow up research.		• Follow up interview 30.08.14 and 15.09.14 Data confirming implementation of solution (solution of children starting to

	allowed to cook until kitchen-chef situation is sorted. Agreement that children cannot wait for government to act.	called a students meeting, decided to start cooking again and suggested this to headmaster via the suggestions box at his office.			cook again, boys and girls cooking, both children and parents have gone from being passive observant to being active players trying to take influence on their history)

6.3.4 Summary of Q 3) How can the education of Kibuko primary school pupils be improved?

Passivity of stakeholders and halt in the regular school meals were two problems understood as bearing potential to improve education situation in case of their resolution or diminution. Their resolution bears potential for improvement because it will diminish the hunger barrier between children and their education. The stakeholders were very clear on defining hunger as a problem, which kept their children physically and mentally from learning and performing well at school.

"Children starting to cook again" was one possible measure of improvement. Parents cooking meals, parents providing lunch packages, parents paying for a chef and a kitchen were alternative solutions, which however according to the stakeholders were not interesting or immediately implementable. The alleviation of short-term hunger acted as educational intervention. How hunger was alleviated was not important, as long as it was not harming the children. The disadvantages of children cooking were real, but when weighted against the disadvantages of not cooking they became relatively smaller.

How can the education of Kibuko primary school pupils be improved? is a question directed at the stakeholders of Kibuko programme. This improvement process is concerned with practical and real solutions that stakeholders want, need, own and implement by themselves. A nationally or internationally funded SFP be a preferable solution compared with the SFP of Kibuko primary school that served "only" three meals a week and which is based on children working. An out-of-house SFP is not being offered in Kibuko village and therefore lacks the potential to improve the children education.

The programme had proven to be beneficial for children's education and this with the little resources available. Children cooking themselves brought disadvantages with, however they were relative when compared with the harm no school meals could bring. A main challenge around solving the cooking problem was that the

stakeholders had taken on a passive role and were not actively involved in finding a solution to the problem. When the stakeholders realised they could actually influence their situation, the ground for finding and implanting a solution was created. This ground was created by engaging the stakeholder in critical dialogue on the situation and their role in it with the purpose of developing their critical thinking. Through critically analysing their situation the children concluded that they did not want to wait until parents or teachers had solved the situation – the children decided to start cooking again. Likewise the parents decided that non-cooking was harmful for the children and endangered the maintenance of the entire Kibuko programme, thus action was needed. Parents had to find a better solution to children cooking, but meanwhile the children could go back to cooking.

This closes findings part II. The story chapter told the overall story of the school and the research. Q1 analysed the system and concluded in strength and weakness of it. Q2 analysed the impact the programme has had on education of children. Q3 actively looked and pursued potential improvement strategy of programme with the purpose of improving children's education. Building upon this part II of findings presentation, part III will focus on discussing the overall RQ *"What potential do farming based school feeding programmes have for decreasing hunger, increasing school attendance and improving educational performance?"*

FINDINGS PART III

7 DISCUSSION AND COMMENTARY

7.1 What potential does Kibuko programme have for decreasing hunger, increasing school attendance and improving educational performance?

Kibuko primary school runs a farming based SFP. Analysis of the previous chapter suggests that Kibuko primary school's farming based SFP has decreased hunger, increased school attendance and improved educational performance. This means that it has proved its potential of decreasing hunger, attendance and performance at the school. In this chapter, I discuss to which degree these improvements have occurred and also the likelihood and sustainability of future increase of the improvements. I aim to shed light on and discuss what else the programme did, and discuss the programme's limits, challenges, and future.

I have discussed some points and their relation to the programme earlier. In such cases, to avoid repetition, I will refer to corresponding sections of the thesis.

7.1.1 1) Decreased hunger

The SFP serves three lunch meals per school week. Reportedly, "all" children come to school without eating breakfast and around four of five students do not consume any lunch unless the school provides it.

Between 2/5 and 3/5 of children would be hungry every lunch of the week if the school meals were not served. These children would not receive lunch money or a package from home during the days the programme is not providing food and are not able to return home due to far distance.

The parents are willing to let the children work on the school farm and even assist themselves, for the return of three lunch meals for their children. The stakeholders are the experts of the situation and they valued the three meals served as fundamental to decrease hunger. Therefore, my conclusion is that Kibuko SFP has decreased hunger to a certain degree.

Because the school already has cultivated most of their available fields, the teachers, pupils and parents cannot significantly increase the amount of cultivated maize, beans and vegetables for school meals. In this remote mountainous area, a further increase of existing production efficiency is unlikely. The school has adopted

and benefitted from farming methods developed by SUA. There is low chance of further implementation of inputs that might increase yields, as fertilizers, improved irrigation system or tools. Such resources are not available.

The school sells some of the harvest from their fields on the market. The school needs income, and there is limited capacity for cooking. Unfortunately, an increase in cooking frequency and a consequential decrease in children's hunger at school is unlikely. The cooking already stopped for four months due to challenges that the stakeholders did not overcome. They resumed cooking because they found hunger as doing more harm than the children's cooking would. As long as the children cooks the meals, an increase in cooking from three days a week seems improbable.

Therefore, the Kibuko programme cannot alleviate hunger. Even externally funded and implemented school farms, that both serve as practical learning ground and providers of food for a SFP, can only meet a fraction of the quantity needed to feed an entire school (FAO, 2014, Robert and Weaver-Hightower, 2011). However, for parents worrying about their children suffering from hunger, the decrease in hunger – even if "only" three times a week[16] - is significant.

The output of the Kibuko programme is the SFP. Three meals a week seems to influence hunger situation enough to motivate many stakeholders to participate in the programme. Also, research shows the impact the programme had on hunger is likely to have a beneficial impact on children's access to education; the decrease in hunger was thus strong enough to have had an impact.

7.1.2 2) Increased school attendance

The provision of food through SFP increases pupils' attendance (and enrolment). The teachers and students of Kibuko see a causal line between the serving of lunch meals and students' attendance at school. They state that serving lunch meals increases the number of students attending class and how long students stay at school during the day. This attendance was not quantified, thus this conclusion is limited to the stakeholders statement.

The degree to which the Kibuko programme impacted school attendance, I was not able to establish, due to lack of quantifiable data. Quantification of the attendance list would be interesting to establish how close the attendance is from

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[16] Here week is referring to five days school week.

being complete on days food is served. This would tell me more of the potential the Kibuko programme has in future.

Attendance seems to be connected to both provision of food at school and general increased support of parents and children going to school. The FAO lists "contributing to increasing access to education by attracting children and their families to a school that addresses topics relevant to their lives"(FAO, 2014, p.5), an aim of implementation of school gardens. Parents confirmed their own increased support for children going to school, because parents valued the agricultural education at school.

7.1.3 3) Improved school performance

Both educational performance results and the former analysis of Kibuko programme suggest that the programme made a significantly beneficial impact on children's education. Students' performance at the PSLE improved exceptionally between 2012 and 2014. The PSLE of 85% and 69% passing rate compared with previous passing rate around 42% and 24%.

The educational impact of the programme is threefold, as elaborated in chapter 6. School meals ensure the pupils' physical ability to learn. School farming bridges the pupils and the local community through relevant and motivating learning activities. The pupils' improved performance is condition for secondary and further education.

Due to lack of arable land and input resources that could have increased yields, the programme faces physical constraints that limits the potential to have more school meals or to earn more money from sale of maize and beans. Still, the impact of the Kibuko programme on improving the education of children through provision of food so they would be able to concentrate and stay in class was one of the main benefits the stakeholders attributed the programme. However some stakeholder associated the programme and supported the programme with interest in other benefits.

7.2 Kibuko programme's other impacts

In a workshop farmers mentioned many impacts and benefits outside direct improvement of classroom education (Workshop 05.04.14). "Food during school hours to enable children to concentrate", "Self-reliance of children when they drop

out of school" and "the acquisition of farming skills and "good attitude towards agriculture" were the three most mentioned benefits by these stakeholders. In each focus group one of these three points was chosen as their main motivation for supporting and contributing to the Kibuko programme. See appendix (3) for more information on results from the workshop.

Further benefits associated with the programme are the money it creates for the school, the community development, the additional learning platform it offers through practical learning and how it facilitates teaching children about agriculture, which is part of the syllabus. The benefits both relates to the implementation of out-of-house SFPs and school farming programmes. The following section will discuss their relationship to the programme and the meaning of them in terms of improving the children's educational experience.

7.2.1 1) Self-reliance and Life skills

Self-reliance is the main benefit of the Kibuko programme for children. The Kibuko programme teaches pupils agricultural knowledge and skills (including goat husbandry) which enables them to produce food - now and in future. The pupils get an opportunity to make a living if they do not pass the PSLE, which is the gateway to secondary school. This opportunity takes or decreases the fear for what to come after primary school (within a year's time) and makes them independent from an employer (Workshop, 05.04.14). The pupils and their parents are fully aware of the harsh conditions to which the children of 12 years old and younger are exposed. High unemployment, low passing rate PSLE, the combination of poverty, food insecurity, and absence of a welfare state justifies their fear and interpretation of the situation.

The students do not "only" acquire agricultural knowledge and skills. The students also learn how to set these skills to use connecting them with the full circle of a farm from planting, harvesting, selling, and cooking produce to reinvesting money or replanting seedlings from last harvest. Students are not "simply" taking orders and fulfilling one task. They are involved in thinking of tasks that they need to fulfil, coordinating when and by whom these tasks are to be done and responsible for making sure these tasks are indeed accomplished. See chapter 6 for more specific information on organisation of the Kibuko programme. The headmaster and the functioning of the whole programme relies on students to check what needs to be done on the farm and to take care of the goats. Students learn management skills, such

as human resource management, time management, keeping records of seedlings, harvesting and selling. Stakeholders refer to these skills acquired through children's participation in the Kibuko programme as life skills.

Parents of the children, despite being farmers, do not have the agricultural knowledge and skills they would like and need to improve the potential of their farm. Parents value the programme highly for the agricultural knowledge and skills the children acquire and bring home. This highlights the limited availability of and access to knowledge in the area. This was confirmed by the parent interest in agriculture extensions officer coming to school, because this is their only access to agricultural knowledge and improved methods.

Children say that the knowledge and skills learned and acquired at school are unique to school and cannot be acquired at home. Some examples: At home, they conduct tasks, whereas at school they are responsible for designing the task, coordinating when and who does the task (Students, interviewed 12.04.14). At home they use manure everywhere, whereas at school they first analyse the soil and only use manure where necessary. Hardly any of the parents keep goats, thus the value of learning about goat keeping is invaluable for their future self-reliance. Interactions with parents in the workshops confirm that many parents are illiterate, which suggests that many do not keep records of their farming activities.

Parents do not have the opportunity to transmit all the knowledge they would want and the children would need to be self-reliant and food-sufficient, which highlights the importance of parent attribution the Kibuko programme and the value of the programme for the children's future. Parents say that knowing that their children learning to how to sustain themselves through a farming is an invaluable relief for the parents (Workshop, 05.04.14). Considering that the majority of children are likely to drop out after primary school the education in primary school is what they have to build their livelihood on.

7.2.2 2) Improved attitude towards agriculture

The Kibuko programme does not only teach children agricultural skills and knowledge, it also brings prosperous agriculture close to them. They learn to know the possibility and opportunity of entrepreneurship, food security and self-reliance (Workshop, 05.04.14). Improving children's attitude towards farming and rural life is

one of the aims connected to institutional implementation of cultivation activities at schools (FAO, 2014).

To inquire the pupils' attitude towards farming, I asked 13 children about their anticipated roles in agriculture in their future life. Even when they aspired to another job, the majority (four out of 13) of children saw agriculture as a solid part of their future. Even in their dream job, they talk about producing food and earning money with farming. See the questionnaire in the appendix (3). This was surprising, considering when I talked to primary school children of Nyandira primary school and asked them if any of them wanted to become a farmer, not a single child said yes. When asked why they explained to me that farming is extremely hard and not remunerating and unsafe work (Nyandira primary school, 2013). In light of 80 % of Tanzania working as small-scale farmer (WB, 2013) and the majority of children becoming small-scale farmers, a good attitude towards farming is important. The involvement in farming in the Kibuko programme and the gained awareness of the connected opportunities breaks down the barrier between children and the hard work associated with agriculture. This may be less important in children school education, it is however extremely important for the children's future and Tanzania.

7.2.3 3) Self-reliance of school

The stakeholders in Kibuko programme identified income generation as one main objective and benefit of running the programme. The school was able to pay for school expenses, which otherwise would have had to be paid by parents or would not have been paid. Parents and teachers said that it is also more motivating and trusting for parents to give money to the school for financing a school project like a kitchen, when the school pays half of it. However, the school needs a lot more money than what can be financed by the school farming.

7.2.4 4) Community development

The parents emphasized that the knowledge and skills acquired by the children at school improved the household food security and economics. The children learned about improved agricultural methods and selling harvest, and they would share and apply this knowledge at home (Workshop, 05.04.14). The learning curve of agricultural knowledge and skills transcended the school, and the school became a valuable source of knowledge for the parents and the community. Due to geographical

and communicative isolation, the school was the only source of to new agricultural knowledge in Kibuko.

The school was not only a source of knowledge, but also a source of material input. The school was producing maize seeds and growing tree seedlings for sale. The seedling production and sale at the school is mentioned as a benefit of the Programme. The school produces good seedlings and seeds and sells them to the community. The farmers say these seeds are better than the ones they have access to at the market. The schools seedlings are of better quality, cheaper and they trust the seller.

Stakeholders say the programme is fostering agricultural education in the community and report increased and improved harvest due to new agricultural inputs. Inputs both comprehend knowledge, skills and materials. The stakeholders are the experts and know the evolution of their harvest and the community since the inception of the programme. When the parents say the seeds of the school are better, they learn that from their children and their harvest has improved thanks to improved seeds and methods learnt from their children,

7.2.3 Summary

The programme has demonstrated its potential by decreasing hunger, increasing school attendance and improving educational outcome since its inception. The programme has proven to be beneficial for children education both in terms of classical education and life skill education.

The decrease in hunger and improved in educational outcome in combination with these additional four benefits (Self-reliance and Life skills, Improved attitude of children towards agriculture, Self-reliance of school, Community development) represent the justification and reasoning for why the Kibuko programme is contextually valid and important programme. I doubt that "solely" the decrease in hunger would have been enough to motivate the stakeholders to run the programme. I think these additional four benefits are important in terms of making the hard work and sacrifices related to the programme acceptable. The sum of benefits is so attractive to stakeholders that they outweigh the hard work and sacrifices related to the programme.

I do think the programme implementation, maintenance, and how much time it consumed from the stakeholders is justified because of the local and educational

benefits. Nevertheless, there are some challenges that need to be considered in terms of Kibuko programme being an educational intervention in areas such as Kibuko.

7.3 Challenges to the Kibuko programme model

The approach Kibuko programme chooses, brings some conceptual challenges with it.

- Challenge in terms of the Kibuko programme' self-reliance dimension, where the school and the community are taking over a responsibility of the state
- Challenge in terms of Kibuko programme being based on children working.
- Challenge in terms of Kibuko programme's large focus on hunger, when looking at it as an educational intervention
- Challenge in terms of Kibuko programme's large focus on teaching agriculture and agriculture not being part of mandatory Tanzanian primary school syllabus
- Challenge in terms of Kibuko programmes' sustainability.

7.3.1 Challenge in terms of the Kibuko programme' self-reliance dimension, where the school and the community are taking over a responsibility of the state

I see a challenge in terms of the Kibuko programme' self-reliance dimension, where the school and the community are taking over a responsibility of the state. Kibuko programme is producing its own income by selling the harvest. This is highly valued by parents and students, because it allowed the school to make needed purchases and share these expenses with parents, resulting in lower school fee contribution. In addition, through the provision of food through the school farm, the parents do not have to pay money for school food or provide of their own harvest. The school is self-reliant in terms of running its own SFP and producing its own income, which the school uses to cover school expenses. These expenses include fundamental teaching elements such as additional teachers, paying for examiner and exams. Sometimes these expenses are shared with money the school receives from the government and a "voluntary" school fee contribution by parents. Primary school is said to be free in Tanzania and therefore the government should at least cover education related expenses. The financial dimension of Kibuko programme Kibuko has created a certain self-reliance of the school.

Due to the programme, Kibuko primary school has increased self-reliance in terms of food security and finances. The programme improved food security and financial situation of the school, however it did not manage to satisfy the schools' financial and food needs.

Secondly, the research revealed institutional challenges, which cannot be met by the school being self-reliant. Some of the challenges were mentioned within this thesis are the low working ethics of government teachers, lack of governmental (or any) control mechanism of teachers, mandatory passing of PSLE to attend secondary school.

The self-reliance of Kibuko programme did not reach the point of actual self-reliance. The need for the school to attempt self-reliance is questionable from the beginning in terms of the government promising free education and not providing a SFP. Despite the incomplete and doubtful causes of attempt of self-reliance, the concept of self-reliance is interesting.

An increased self-reliance of the school as approach to solving challenges within the Tanzanian educational sector is interesting. First the colonial powers and later the first Tanzanian president Nyerere pushed for self-reliance of schools (Phillips and Robert, 2011). The policies and objectives behind differed, but both had in common that they pushed for schools needing less inputs from outside. The concept of self-reliance has prevailed. In the global educational development discourse on sustainability self-reliance and the practice of school farms and gardens are high on the agenda (Phillips and Robert, 2011).

A school's increased independence on external inputs and assistance in itself is certainly not harmful for children's education. When a school manages to meet its need through its own harvest and money production, self-reliance seems like a working educational policy. However, what if the school does not manage to be self-reliant? An educational policy relying on school's self-reliance bears the immense risk of the school's not being able to be self-reliant (Phillips and Robert, 2011).

The government pays part of Kibuko primary school. One cannot talk about complete absence of government funding or responsibility. Without doubt, the increased self-reliance of Kibuko primary school had positive impacts on children's education. Nonetheless, one needs to bear in mind that the programme is a reaction to severe shortcoming of Tanzanian education policy and not the result of an education policy supporting and assisting the school to become self-reliant. The PSLE passing

rate of neighboring schools, which are frequently lower than 10 and 20%, suggest that the surroundings schools are not able to reach self-reliance[17]. This suggests that the majority of schools are not able to be self-reliant. Therefore educational policy is needed.

7.3.2 Challenge in terms of Kibuko programme being based on children working

Kibuko programme is based on children doing most of the farming and cooking, which raises the question of legitimacy of children working. Some parents questioned if its legitimacy in terms of children loosing classroom time while working or cooking. However, none of the parents and children questioned the fact of children working. All children work at home as well. Phillips and Robert (2011, p.89) observe the same:

> "The parents we spoke to are indeed pragmatists; their children must learn sooner rather than later to support themselves and contribute to the livelihood of their family. This seems an important parental value to respect in the conceptualization and implementation of school cultivation initiatives".

Parents of Kibuko primary school are concerned with keeping themselves and their children alive and are relieved when they know their children have acquired skills to feed themselves and their family (Parents, interviewed 12.03.14).

However, children working and children being exploited as labour force are two different things. The former headmaster and some of former teachers of Kibuko primary school had abused the schoolchildren as their labour force on the school farm. Unfortunately, exploitation of children as labour is a potential impact school cultivation can have. The exploitation is often overlooked due to the many advantages one anticipates to find (Robert and Weaver-Hightower, 2011).

Connected to the abuse of children as labour force, is the misappropriation of the harvest of school farms. Unfortunately this is a common phenomenon due to teachers being poorly paid and motivated and economic concerns overweighing (Phillips and Robert, 2011, FAO, 2014).

> "This situation, coupled with an authoritarian school climate where pupils have no participation in the management of their produce, all too easily generates a teacher-pupil relationship of mutual mistrust and resentment, where pupils feel exploited as cheap labour for the teachers' benefit. This can be partially avoided by parent and community participation in the programme", FAO 2004 School gardening concept note, p.10).

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[17] All PSLE results of the neighboring schools can be accessed on the NECTA's online database: http://www.necta.go.tz/psle.

7.3.3 Challenge in terms of Kibuko programme's large focus on hunger, when looking at it as an educational intervention

I entered the field with the premise that children experienced limited access to education due to hunger. Soon into the research, I realised the poor teaching conditions was a major limitation to children's access to education. One of the main problems raised by stakeholders was the poor student/teacher ratio. It was not as simple as to blame it on hungry stomachs although the stakeholders confirmed that hunger was an important issue and appeared to be even bigger than I had expected.

In Kibuko teachers often do not show up for their work, because they lack incentives to do their work well. They are paid directly by the government and not by the school, which eliminates the schools and the headmaster's leverage to demand good work. Unfortunately, high degree of teacher absenteeism from work is a common problem in the whole of Africa (Robert and Weaver-Hightower, 2011, Snoen, 2015).

In the light of these findings, what justified an educational intervention focusing hunger? Could it be more important to focus on improving student/teacher ratio than hunger? Weaver-Hightower (2011) in his article on "Why Education researchers should take school food seriously" draws back on Belasco's (2008) concept of academia's classical dualism of mind of over body:

> "[…] [A]cademia's classical dualism of mind over body has bred 'disdain for something as mundane, corporeal, even 'animalistic' as eating' (p. 2)[(Belasco, 2008, p.2)]. This dynamic is perhaps stronger in education, a field decidedly fixated on the mind. Learning is often conceptualized as occurring in a social vacuum—the black box of research—denuded of concerns of the body, its needs, its pleasures, and its politics. Food, as highly body-centric, thus might seem unrelated to schooling's purest mission, the acquisition of skills and knowledge", (Weaver-Hightower, 2011, p.16).

According to Belasco (2008) and Weaver-Hightower (2011) such a shift of focus would be typical for the education sector and reflect educational policy makers and researchers' ignorance towards the body's central role when it comes to learning and education. It is true that learning is heavily impaired when there are not teachers teaching. Likewise leaning is heavily impaired when a child is hungry.

Alleviation of hunger, decrease of hunger, decrease of under-nutrition creates the possibility for learning, but it does not ensure academic success. However, without food academic success is highly unlikely due to limited learning ability of a hungry child. Concluding, a focus on hunger is justified, however it is important to not solely focus on the *body* in order to not separate the body from the mind.

7.3.4 Challenge in terms of Kibuko programme's large focus on teaching agriculture and agriculture not being part of mandatory Tanzanian primary school syllabus

I see a challenge in terms of Kibuko programme's large focus on teaching agriculture when agriculture is not a part of tested subjects at PSLE. Agriculture is part of a new introduced subject "studi ya kazi", which means as much as vocational training in English. Vocational training-classes teach on subjects like "baskets weaving", "production of bricks", "practical learning and science", "agriculture", "animal husbandry", "washing clothes". The teachers decide subjects to teach according to the context of the school's environment. However, regional and national exams do not include these subjects.

Rural primary schools have an extreme lack of teachers and resources. Many of the children fail the national exams and are not able to attend to secondary school. Thus, schools use all available resources for teaching subjects tested on national (and regional) level. Parents of Kibuko primary school are very clear in terms of passing PSLE being the absolute priority over the Kibuko programme. This means that they prioritise teaching of subjects tested at national exams (PSLE), and it means that children cannot apply their agricultural knowledge at the PSLE.

My opinion is that education should equip children with skills to manage life, contribute and fit into Tanzanian society. Tanzanians refer to agriculture as the "backbone of Tanzania". Some work suggest that a return to a larger focus on agriculture as it was during Nyerere period could benefit children's education (Msuya et al., 2014). 80% of Tanzanian are employed in the agricultural sector (WB, 2013) and a similar percentage of the children will end up in agriculture. Due to low PSLE, many Tanzania children will not continue education to secondary school. Therefore, they need to start earning money. Through agricultural education in primary school the youths might enable themselves to make a living and to integrate in society.

The children passing PSLE and continuing to secondary school also need to pay school fees, everyday meals and other expenses. Students of Kibuko primary school wanted to keep a little garden with vegetables to manage to attend secondary school. They wanted the garden to provide them with food and allow them to finance secondary school. See questionnaire in appendix (3). Many children do not attend secondary school, because their parents cannot afford it, thus an additional income could possibly allow this.

The agricultural education – despite not being tested at exams - is certainly not abundant. However, in terms of Kibuko programme as educational intervention in terms of state education and it improving the results of children at PSLE, agricultural knowledge does not directly contribute to that.

7.3.5 Challenge in terms of Kibuko programmes' sustainability.

I see sustainability as the main challenge for Kibuko programme's potential to decrease hunger, increase attendance and improve educational performance. In this context, the focus is on social sustainability in terms of stakeholders' capacity to keep the Kibuko programme running.

Chapter 6.1 analysed and discussed the organisation, foundation and strength and weakness of the latter of the programme. The stakeholders believe that the programme could bring a needed improvement for the community. They also agreed on the need for parents' activities in combination with the headmaster presence at the school as the driving force keeping the programme running, despite all the challenges and compromises that come with running the programme.

The long list of benefits stakeholders experience and associate with the Kibuko programme shows that they believe in the programme both being beneficial for children's education and community development.

There is no basis for assuming a soon improvement of Kibuko primary school education resulting from governmental side, thus the need for the community to bring an improvement is unfortunately very probable to remain. This is one condition for the sustainability of the programme. However the actual need for an improvement does not have any impact on being a drive for the Kibuko programme, unless the "need for an improvement" is perceived as a need by the stakeholders. If the stakeholders are convinced by a politician that the stakeholder do not need to bring an improvement themselves due the government being responsible for such improvement, then the sustainability of the programme is highly jeopardised. The programme presupposes volunteers to act from common interest of improvement of children's education. This is why I perceive the headmaster as being the motivating and monitoring heart and head of the system and as crucial for the programme further existence. The need for the system was there before he arrived and the so was the parents dissatisfaction with the situation. It was the headmaster that suggested the Kibuko programme and who convinced the stakeholders that they needed to do

something. The halt in the cooking showed how he is forceless without the parents backing him up. However, he still managed to continue the cooking and farming.

The organisation of the programme allows the headmaster to be absent a day or a couple of weeks, because tasks and organisation of task are shared and stakeholders "control" each other and take over task when someone forgets them (see chapter 6.1). However, the headmaster was the driving force in the inception of the programme and he is the driving force in the organisation. Eventually the current headmaster will be relocated to another school and a new headmaster will be allocated to Kibuko primary school. The current headmaster was passionate and capable of starting and running the Kibuko programme – only if the new headmaster is equally capable and willing to run the programme, see the necessity of his and the community personal investment and the potential of the programme to answer some of those needs, then the programme can be continued. When asked about the sustainability of the programme in terms if it will continue in future, both the parents and the headmaster were pessimistic. Based on the stakeholders' general experiences with headmasters, it is likely a new headmaster will like alcohol and not care too much about students. The programme is highly reliant on motivated and capable stakeholders and dependent on a motivated and capable headmaster, thus the programme is likely to ceases to exist, when the headmaster leaves the school.

8 Comments on methodology

Before concluding, I would like to make some comments on my experience doing AR. For this research project, I needed a methodology that was people centred, hence the SFP of the case study originated in people and not in an institution. Furthermore, I needed a methodology that allowed me to study something I could not clearly define beforehand. AR proved to be an adaptive and flexible research framework, which allowed me to continuously adapt the research design and direction, and most importantly allowed me to concentrate on people as a source of data; being very people centred and based on letting the data lead the research proved beneficial.

AR allowed me to establish a close relationship with the stakeholders which was the basis for the exchange, and most importantly to understand the information exchanged. When I asked the stakeholders to explain the programme organisation to me, they were initially incapable of doing so because they had never systemised their actions and task distributions. Each stakeholder knew their role, but they did not necessarily know how this fitted with everyone else and how all of it lead to the overall Kibuko programme. For me to understand and document the Kibuko programme, I had to find a way to systemise the story of the programme. AR principles such as reflexive critique, dialectical critique, and collaborative resources (as defined by Winter (1989)) allowed a transfer of information and perceptions across different background, context, language and culture of participants.

The close interaction with stakeholders over three months developed a relationship of trust. This made the stakeholders receptive to, and therefore also vulnerable to my input. In combination with the participatory setting of the research this closeness created a potential ethical dilemma due to the potential influence I could have in the problem solving process. This made me question the established closeness and participatory dimension of AR. This fear of an ethical dilemma accompanied me through the field research. However, when analysing the interviews and writing the thesis I realised that my fear of this ethical dilemma was based on a *potential* ethical dilemma and not an actual *on-going* ethical dilemma.

Becoming a stakeholder in the research brings this challenge of potentially implementing ideas on the research communities. Therefore this *potential* ethical dilemma is something that is inherent to participatory AR (Scheyvens et al., 2003).

Principles of collaborative resource, of risk and plural structure defining the code of conduct AR (Winter, 1989) offered me useful instruments to deal with the dilemma of assuming an authoritative voice. These principles "forced" me to listen to the stakeholders' wishes and not assume an authoritative voice. Researchers conducting AR have to be conscious about this potential dilemma and skilled and willing to follow theses principles. Social responsibility is something that comes with a participatory research approach (Scheyvens et al., 2003).

9 Concluding remarks

Building upon the two previous chapters, which already offered some concluding remarks on the potential of the Kibuko programme and the chosen research strategy, I will end this thesis with some reflections on the overall research experience, some concluding remarks on the main findings of this research and where they point to in the future.

Low-income countries, like Tanzania, are financially limited and cannot afford a nation wide SFP. To find out how SFPs can be more cost-efficient, this research studied a school that was running a SFP, sourcing the food on its own farm and independent from any external government or NGO input. The question, *"What potential do farming based school feeding programmes have for decreasing hunger, increasing school attendance and improving school performance?"* is what guided the research.

The critical-dialectical discussions on the Kibuko programme's potential increased the stakeholders', and my understanding and awareness of programme organisation, problems and possibilities. This platform of dialogue was very powerful, not only in increasing the stakeholders and my understanding of the situation, but also in serving as platform for problem solving. The problem solving was facilitated by increased consciousness of the stakeholders as well as through the availability of the platform for a dialogue. The problem solving process concentrating on the halt in the cooking, ending with the Kibuko programme cooking three times a week again, exemplifies the power of dialogue. It demonstrates interaction of theory and action leading to praxis when stakeholders of a situation are engaging in critical dialogue; it demonstrates the potential of AR as a mediating and enabling tool for critical consciousness through offering a platform of mediated dialogue; it demonstrates the capacity of stakeholders of Kibuko programme and as such of general people's capacity to influence in their environment.

Based on the evidence of the research on Kibuko programme's potential showed, I conclude that in-house farming based SFPs have potential to improve children's educational situation. In Kibuko, the duel holistic impact of the school feeding programme and school farming changed the learning condition and thus enabled an improvement in the learning outcome.

This in itself is not a surprising event, however the fact that a programme with so little resources was able to have such a strong impact is surprising. This is an important finding, because it shows that a farming based SFP running on so little resources and demanding a so much work from its stakeholders, and in return "only" provides meals before exams and three meals a week creates a incentive big enough for influencing children's educational outcome. Likewise the provision of food and the impact of the latter showed to be a big enough incentive for stakeholders to contribute and thus realise and maintain the programme. The sourcing method additionally improves the learning condition, provides important agricultural skills and life skills to children and benefits the community development, which again is important for the realisation and maintenance of the programme. This suggests that the potential of a local in-house farming based SFP is large enough to have an actual beneficial impact on children's education and therefore is an idea worth pursuing for other schools with similar conditions as Kibuko primary school.

The high reliance of the Kibuko programme on benevolent and capable headmaster as key coordinator and motivated stakeholders limits the sustainability of the programme significantly. However the limited sustainability does not affect the programme impact while the programme is actually up and running.

The research showed that there lies potential in using local forces and using the community and the school children themselves as sources for both ideas and implementing the idea in terms of coordination and work capacity. The potential in labour work that can be accomplished when a community works together and potential of innovative ideas is impressive. The potential in ideas is impressive considering the absence of resources and great impact of Kibuko programme.

The Kibuko programme SFP improved the educational performance of Kibuko primary school, however the model did not solve the problem primary schools in rural Tanzania face, it simply reduced their impacts. The programme's influence reaches a limit when it comes to influencing institutional challenges, such as low student-teacher ratio and the consequences of such problems. The research showed how the government affects rural primary schools by not fulfilling its responsibility and how poor the resulting teaching conditions are.

The absence of the government is of course negative, however it also presents an unexploited source of resources and opportunity. The government might not have the funds to finance a national SFP, but it might have the capacity to, for example,

improve the teacher distribution mechanism. Maybe a SFP model that combines self-reliance and state responsibility and draws on potential of local ideas and government structure and possibilities could bring improvement.? It would be interesting to do further research on what state input would allow the Kibuko programme, or similar programmes increase their potential and increase its sustainability?

The Kibuko programme model can be questioned in terms of sustainability and in terms of it taking over state responsibility, nevertheless it did change the future opportunities of the children, who benefit significantly from the programme. A out-of-house SFP could potentially be a greater solution, however 75% of Tanzanian schools do not have a SFP and therefore do not reach children. Around half of Tanzania's population is of primary school age or have just graduated, and between a third and half of them fail PSLEs. Innovative measures such as the Kibuko programme which can have an impact are important in order to improve education in Tanzania. Their potential should be acknowledged and integrated in educational improvement strategies in Tanzania.

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Appendices

Appendix 1 - PSLE results of Primary Schools neighbouring Kibuko Primary School

PSLE results of Primary Schools neighbouring Kibuko Primary School

Village	Closer to a centre than Kibuko	2013	Compared to Kibuko	Improvement from 2013 to 2014	2014	Compared to Kibuko	Average passing rate
	C = closer to centre. R =more remote than Kibuko	% of students passing PSLE *	L = Lower or H= Higher passing rates than Kibuko	↗ = improved PSLE results since 2013, not improved results = ↘	% of students passing PSLE *	L = Lower or H= Higher passing rates than Kibuko	(x% of 2013 + x % of 2014) : 2 = average %
Luale Wad							
Luale	R	21 %	L	↘	12 %	L	17 %
Masalawe	R	6 %	L	↗	15 %	L	11 %
Lukunguni	R	18 %	L	↗	21 %	L	20 %
Kododo	R	NA	NA		54 %	L	54 %
Kikeo Wad							
Chohero	R	14 %	L	↗	26 %	L	20 %
Mhalo	R	6 %	L	↗	24 %	L	15 %
Ngowo	R	7 %	L	↗	13 %	L	11 %
Kikeo	R	6 %	L	↗	25 %	L	16 %
Nyandira Wad							
Tchenzema	C	28 %	L	↗	50 %	L	39 %
Ngungulu	C	86 %	H	↘	40 %	L	63 %
Londo	C	64 %	L	↘	37 %	L	51 %
Kibuko		**69 %**		↗	**84 %**		**77 %**

*Source: NECTA, The National Examination Council of Tanzania, 2016b. *Primary school leaving exam* [Online]. http://www.necta.go.tz/psle. [Accessed 02.02.2016 2016].

Workshop at Kibuko primary school, 05.04.14.
BENEFITS OF KIBUKO PROGRAMME

Underlined the benefit identified as most important by each stakeholder group

Benefits defined by students of standard 6
(4 students)

- Farming skills
- Food to eat at school
- Money for keeping the school running
- Development of the school, the farm, the community.
- Self-reliance for their own future.
- Entrepreneurship – learn how to make more money themselves
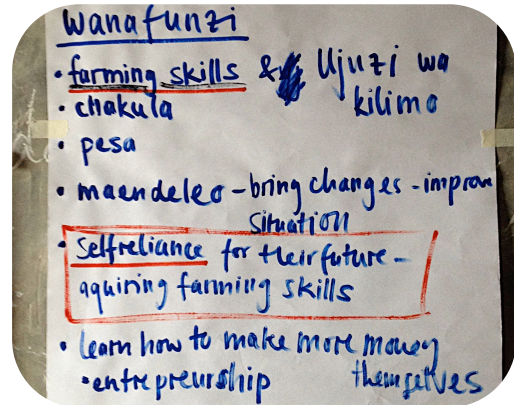
Benefits suggested by new teachers
(3 new government teachers)

- Farming skills and willingness to do farming
- Empower students to think creative and independently
- If you connect school (theory) and farming (practice) it is easier to understand and acquire knowledge. Higher quantity of knowledge is absorbed.
- Students are near to farming. It is easier from them to start farming.
- School and community development thanks to teamwork of community and school
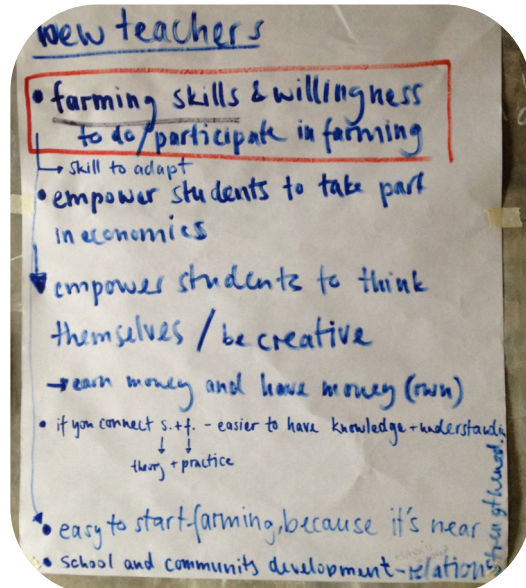
Benefits defined by School Committee (2 parents)

- Learning agricultural skills and being able to produce food
- Backup plan when the children do not reach secondary school
- Food at school so they are able to concentrate in class and learn
- Increase agricultural experience of students increase agricultural experience of community – educates community on agriculture
- Children meet agricultural extension officer – access to expertise on agriculture
- Seedlings for next season for both school and community
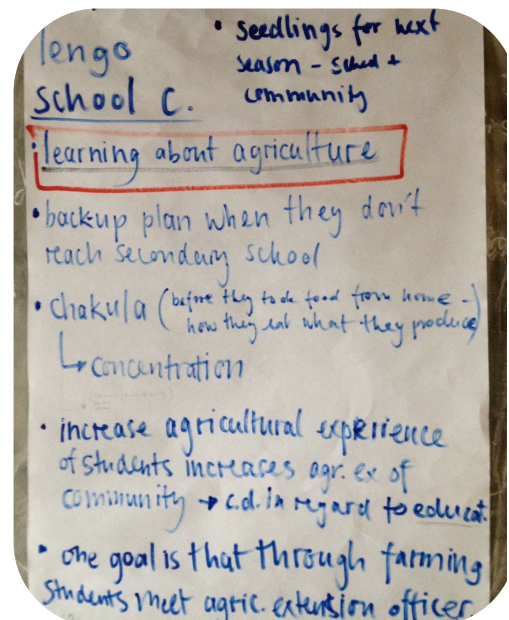
Benefits defined by Parents Board (3 parents)

- Reciprocal impact between learning to produce food – eating food – and being able to concentrate at school. The parents drew the graphic underneath to explain the phenomenon.
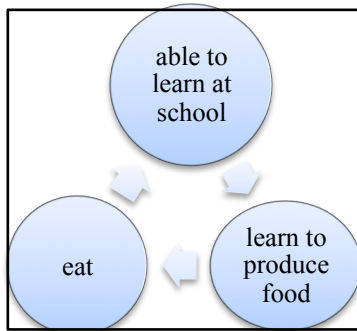
- Money for the school
- Food for the children's health in general (many children do not receive food at home)
- A child that learns about food production and selling at school can enable his or her poor family at home to earn money. Then the family can send another child to school.
- Sustainable knowledge and skills for students and the community
- Food enables children to learn at primary school and consequently enables secondary (and even further) education
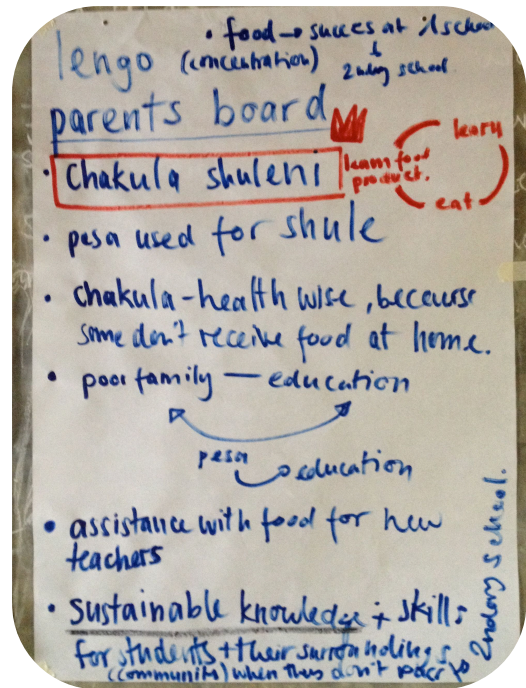
Benefits defined by old teachers (headmaster, volunteer teacher who had been at the school for 1 ½ years)

- Part of the syllabus – vocational training
- Practical learning teaching approach
- Food for school for children to be able to concentrate
- Life skills (knowledge, skills on farming and managing a farm)
- Independence from being employed - able to be self-sustaining
- Knowledge on animal husbandry
- Money for the school

Further aims of the programme

- Provide community with food and seedlings
- Health benefit of milk and meat in children's diet
- Children become experts on animal husbandry and can teach community
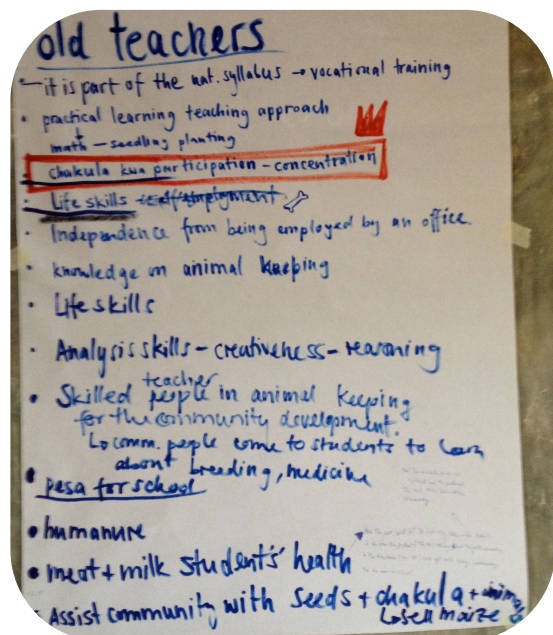
Summary from Workshop 05.04.14, Kibuko primary school
Impact and benefits of Kibuko programme:

The main and primary benefits / purposes of the school programme

- Food during school hours so that they can concentrate
  → Food for learning / **Education**

- Self-reliance when the children drop out of school
  → Farming skills / **Life skills**

- Farming skills (actual skills + closeness to farming)
  → Farming skills / **Life skills**

Further benefits / purposes of the school farming

- Money to finance the school
  → Self-reliance of school / **Education**

- Community development, produce seedling, help poor parents/ farmer to increase their harvest, produce a self-reliant = self-employed youth
  → **Community development**

- Practical learning
  → **Education**

- Part of syllabus
  → **Education**

Appendix 3 - Students' positive attitude towards farming

		Interview with students (st. 6), 05.05.14, Kibuko primary school				
Sex	St. 6	What do you think will happen after standard 7 in your life? (Secondary school or work?)	How will you earn money for yourself and your family when you have left school?	Would you like to become a farmer?	Why would you like/not like to become a farmer?	**Positive attitude towards farming as part of his/her future**
F	Yes	She wants to go to secondary school and university	She wants to earn money for her family by being a journalist, but she will have small business where she sells crops, beans, maize and sunflowers to make money.	She wants to do both	Why does she not "only" want to do journalism? Farming is a safe deal and she needs to sustain herself and help out her parents	**YES**
F	Yes	She want to do further studies after standard 7.	By farming	She wants to be farmer.	She wants to be a farmer because it brings food for herself and her family.	**YES**
F	Yes	She wants to be a doctor. She will be one. She really wants to be a doctor. How? She will study hard.	By being a doctor.	No.	It is hard physical work; tilling for example. It hurt the body and your hands.	**NO**
F	Yes	Secondary school	Farming. Making a farming business by making food and selling it.	She wants to be a farmer.	Without farming you cannot get money.	**YES**
F	Yes	Secondary school. She would like to study engineering.	By selling food.	A farmer.	Farming is nice – it provides you with food.	**NO**
F	Yes	Secondary school. And then? She will sell yams to earn money for further education. She will do both – farming and school.	By teaching and farming. So she wants to be a teacher? Yes.	She wants to be a teacher and a farmer.	Easy to get money by doing both teaching and farming. Why not only farming? If the harvest is low she will not have enough money to come by.	**YES**
M	Yes	Secondary school and then study. Why do you want to study? He wants to go to different colleges.	By being a driver.	No.	Farming is a gamble – you never know if you have enough harvest to come through the year.	**NO**

Appendix 3 - Students' positive attitude towards farming

Sex	St. 6	What do you think will happen after standard 7 in your life? (Secondary school or work?)	How will you earn money for yourself and your family when you have left school?	Would you like to become a farmer?	Why would you like/not like to become a farmer?	Positive attitude towards farming as part of his/her future
F	Yes	Secondary school	Animal husbandry	Yes.	She wants to do farming and animal husbandry to earn money to pay for her studies. She wants to become a teacher. Doing farming and animal husbandry besides it is always good because you earn money.	**YES**
M	Yes	Secondary school. He wants to have knowledge on everything.	While he is still studying his parents will pay. Can he imagine how he will be earning money after his studies then? He would probably do animal husbandry. He has a lot of experience in it, because of the goats and school and because they have cows at home.	Yes. As well agriculture – or "only" animal husbandry? As well agriculture.	Because farming gives good money. When he could choose from all possible jobs? Animal husbandry.	**YES**
M	Yes	Secondary school. And after secondary school? He would like to become a mechanic.	Not as a mechanic. By farming.	Yes.	It gives money.	**YES**
M	Yes	Secondary school. After? Study at university. What? He would like to study medicine.	By being a doctor.	He would like to do framing besides being a doctor.	He wants to do farming beside everything because it is where you start getting money and where you always get food. Very safe.	**YES**
M	Yes	Secondary school and university. What do you plan to study? Vocational training – he wants to become a "fundi" = a mechanic.	He will not earn money for sustaining himself and his family by being a mechanic He will earn this money by farming.	Yes he likes farming and it gives additional money.	He likes farming and it gives additional money.	**YES**
M	Yes	Secondary school	By being a driver. How will he become a driver? By vocational training.	No.	He does not like the farming work.	**NO**

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