

DIVERSITY OF OPINION IN THE FACE OF PREVAILING PRACTICES:
SCHOOLING AND SCHOOL CULTIVATION IN TWO TANZANIAN VILLAGES

By

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ABSTRACT

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In sub-Saharan African (SSA) colonial and postcolonial contexts like rural Tanzania, school gardens/farms have, with very little success, aimed to address school food security for the rural poor by centering on food production. In Tanzania, cultivation played an important role in most rural public schools during colonialism and after independence to supplement school meals, raise revenue, and promote social cohesion (Nyerere, 1967). The problems that these initiatives ran into in Tanzania and SSA in general were racialized colonial policies requiring public schools with African students to produce agricultural goods, the exploitation of students by teachers, insufficient training of teachers in the school subject of agriculture, the inability of such programs to pay for the costs of schooling, and the perception that these programs were detracting from time in schools devoted to national exam preparation and future employment (Desmond, Grieshop, & Subramaniam, 2004; Eisemon, Prouty, & Schwille, 1992; Riedmiller, 2002).

Today, school cultivation initiatives are again being re-established in Tanzania as a component of donor-driven efforts to improve teaching and learning and community health (Food and Agriculture Organization of the United Nations, 2004). Over the period of one year in northern Tanzania, 16 different public primary schools with cultivation programs were first visited and comparisons between the programs were made. Then two donor-supported elementary school garden/farm projects were identified in two rural communities in northern Tanzania and a qualitative approach (interviews, field

observations, classroom teaching observations, document analysis) was used to examine how these two different school cultivation models shape student learning and respond to local needs. The objectives and structures by which certain aims were intended to be accomplished were analyzed and the factors were detailed for why these objectives of the donors were or were not accomplished. This study also investigated variation in school garden and regular classroom activities to determine what students learn from that experience, how teachers connect school agricultural activities to content learning, and what agricultural knowledge is transferred home by students.

In this study, school cultivation programs were also used to learn about the nature of teaching and learning at each school. The diverse views of villagers, teachers, and students in defining a successful school were incorporated to understand their expectations for how primary schools should function in Tanzania as well as the prevailing views and practices for schooling and agriculture and some of the exceptions in light of the major changes that are taking place in East Africa and Tanzania in recent times in relation to rainfall patterns, technology, mass schooling, non-governmental organization involvement, and the expansion of free trade. Finally, the study analyzes the findings of the data in relation to opportunities to learn. It calls for further research to examine school practices and pedagogical methods so that interventions endeavoring to improve educational quality in Tanzania can be implemented to address opportunities for and obstacles to student learning. The findings contribute to an emerging body of literature investigating how school cultivation policy and practice influence student learning and informs other efforts to apply experiential science learning to food-security, agro-ecological practice and community problem-solving.

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KEY TO ABBREVIATIONS

AVRDC — The World Vegetable Center
CCM — *Chama Cha Democracia* (The Democratic Party)
CEF — Commonwealth Education Fund
COSTECH — Tanzanian Commission of Science and Technology
ESR — Education for Self-Reliance
FAO — Food and Agriculture Organization of the United Nations
FPS — Fadhili Primary School
GER — graduate enrollment rate
GER — gross enrollment ratio
IMF — International Monetary Fund
IRB — Institutional Review Board
KIOF— Kenyan Institute of Organic Farming
NGO — non-governmental organization
NPS — Nyota Primary School
NSGRP — Tanzania’s National Strategy for Growth and Reduction of Poverty
OTL — opportunities to learn
PEDP — Primary Education Development Program
PSEC — primary school education curriculum
PSLE — primary school leaving examinations
REDD — Reducing Emissions from Deforestation and forest Degradation
SAP — structural adjustment plan
SES — socioeconomic status
SEDP — Secondary Education Development Program
SR teacher — teacher of self-reliance
SSA — sub-Saharan Africa
SSR — sustained silent reading
TPRI — Tropical Pesticides Research Institute
TMEVT — Tanzania Ministry of Education and Vocational Training
UPE — universal primary education
WFP — World Food Programme

CHAPTER 1

School Cultivation in Sub-Saharan Africa and Tanzania

I think that the school garden nowadays is still important because students learn to work with their hands and also gain important agricultural skills. Lots of jobs in Tanzania require employees to actively work hard and use their hands such as carpentry, farming, masonry, etc. Also, learning about agriculture may enable you to do a lot of jobs, such as being a bwanashamba (agricultural expert in the government). – Elizabet, mother of students at Jiwe Primary School in Ekundu River, which has a school farm

I think these school farm programs prevent students from studying. There are no tools in the school and they have to take them from their home. They have to bring seeds from their houses and some parents can't afford seeds. This has resulted in a lot of student dropout at the school here [in Ekundu River]. Parents were angry because they said their children did farm work without studying. For the development of students it is not good and not for parents either. Parents have to buy school uniforms and in addition seeds and garden tools; parents do not like this. I think that children were changed because they began to dislike these programs. Students were angered because they wanted to come and study for school. Students by law had to go to work in the school farm, but they did not like this work because they wanted to study. The school is for studying in the classroom and not to do work the farm. Many parents decided to enroll their kids in private schools because they saw that students lost time studying in order to work in the school farm. – Paulo, father of students at Jiwe Primary School

Now children eat in school. They need to get corn and beans. Who will you get to work on the school farm? The students. But they will work in the garden for a week and then they will be behind on the syllabus. People say it is their children's fault that they are behind. No, it is the fault of the garden. Maybe if they work just one time a week that would be okay. But if they have a big field of sorghum or corn, that is a lot of work. To plant, weed, and to harvest involves four weeks of work. They lose out in doing this work. Then they have to try to catch up to finish the syllabus. The children will not finish the syllabus. Students work hard in school now in order to get money later. Students work with effort in school but not in the farm field. They see it like punishment if time is taken away from their studies. – Ellen, elderly woman in Ekundu River, a village 20 km outside of Arusha town

Though the availability of free primary education in Tanzania has raised school enrollment to 97%, only 49% of school-aged children actually complete the sixth grade (World Bank, 2005). To address the challenge of getting youth to go to school for

longer, and in conjunction with President Kikwete's recent push for the development of "*Kilimo Kwanza*" (agriculture first) and Tanzania's pledged education targets under the Dakar Framework for Action of Education for All of increasing access to schools and enrollment rates (Tanzania Ministry of Education & Culture, 2004a), school cultivation initiatives have re-emerged in the food shortage areas of Tanzania as an important component of donor-driven efforts to improve school quality. These initiatives are supposed to link the hands-on practice of cultivation to school subjects through the opportunity for active learning, the provision of school meals to increase attendance, and the improvement of school and community food security and nutrition.¹

As the quotes above illustrate, there are conflicting views on the value of school cultivation programs in Tanzania. Using a qualitative approach, in this study I examine how two donor-driven school cultivation models with different educational, farming and community outreach strategies have shaped student learning and how these two models have responded to local needs in two rural public primary schools in northern Tanzania. I have also examined teacher, student, and parent behavior in relation to these models and have sought their thoughts and reflections about their behavior in relation to these school cultivation programs. I also use this focus on school gardening as a window in order to understand about the nature of teaching and learning provided at these schools. Thus, in this first chapter I review the literature and policy dealing with school cultivation in sub-Saharan Africa and Tanzania. Chapter Two puts us in the context of Tanzanian education in general. Chapter Three describes and explains my methods. Chapter Four

¹ For a summary of sub-Saharan African school cultivation policy see Food and Agriculture Organization (2004) and for information on the school food program policy see World Food Programme (2010). For other background on food security in Tanzania see Swarup (2007) and da Corta (2009).

details the learning that emerged about the nature of learning in the 16 different public primary schools with cultivation programs that were visited and also focuses on prevailing teaching and learning practices the two schools that were focused on for this research. Chapter Five describes the expectations held by villagers, teachers, and the ministry of education about the areas in which schools, staff and their students are supposed to be devoted. Chapters Six and Seven are centered on the different approaches of the two non-governmental organizations (4-H and Oikos) in influencing change for the school and community in the two different sites of this research and the constraining factors are detailed for why many of the objectives of the donors were not accomplished. Chapter Eight incorporates the different views of teachers, villagers, and students regarding the school cultivation activities and school subject learning in the two communities. Finally, chapter 9 discusses the different definitions of “opportunities to learn” and analyzes the findings from chapters 3 to 7 in relation to the former definition.

For my research, I identified two well-established school gardens/farms in rural communities.² Utilizing my knowledge of Swahili, I conducted interviews with students, parents, teachers, and service providers to investigate if and how school-level variables related to school cultivation impact teaching and learning as well as community development. For example, I investigated how topics such as curricular content, school organization, teacher capability, and degrees of community participation contributed to student learning and responded to local needs. With an understanding of student learning

² The term “school farming” is more commonly used in developing contexts and represents a more subsistence-oriented approach that is done on a large scale with production of saleable goods as a primary objective. “School gardening” is smaller scale, has been more common in Europe and North America, and the produce is usually used to feed one’s family or community. Because there is some overlap, the two terms will be used interchangeably in this dissertation (Phillips & Roberts, 2010).

as a product of the dynamic and complex relationships of schools, communities, and governmental and non-governmental agencies, this research seeks to inform policies of Tanzanian policymakers and practitioners to further improve learning opportunities for rural students. Ultimately, this work is intended to benefit the students, teachers, and communities in rural areas of Tanzania and also sub-Saharan Africa.

Recent International Policy Developments Prioritize School Cultivation

President Kikwete's push for "*Kilimo Kwanza*" in Tanzania is likely influenced by the seminal policy document released by the Food and Agriculture Organization (FAO) of the United Nations (2004), "Concept Note: Improving Child Nutrition and Education through the Promotion of School Garden Programmes." This document calls for the use of the school garden/farm as a long-term strategy for directly and indirectly combating food insecurity and developing sustainable practices in schools and communities in developing nations. The policy states that a school garden/farm should be placed near schools to be used as a resource to improve learning and also to generate income and/or produce food for schools.

Furthermore, in recognition of the fact that the traditional model of school cultivation in sub-Saharan Africa (SSA) of food production³ may be insufficient for addressing poverty reduction, rural development, and sustainable management of resources, the FAO approach encompasses educational, nutritional, and economic objectives. The educational objectives are centered on the creation of a learning laboratory where, similar to the approach of the non-governmental organization, 4-H,

³ Historically, in SSA, the primary objective of school farms has been food production. Two secondary objectives have been agricultural education and the cultivation of national values. Little or no emphasis has commonly been placed on other learning objectives (Phillips & Roberts, 2010).

active learning is intended to be utilized as the main instructional method. Since, through the learning laboratory, a more relevant learning environment is created to teach basic academic skills (reading, writing, and arithmetic) as well as science and environmental education, the quality of education provided to SSA students is expected to improve through inquiry-based experiential methods of instruction. Another educational goal of this method is to decrease student absenteeism and dropout by providing incentives for student attendance through nutritional support in school feeding programs, food given or sold to their families, and use of the garden/farm to address topics relevant to students' lives (Food and Agriculture Organization of the United Nations, 2004).

The long-term nutritional objectives of the FAO policy include helping students to gain an understanding of the processes of food production in order for them to become empowered to produce food for their own consumption and to develop skills that can be used in times of food shortage. One approach for accomplishing this is to encourage students to start and maintain their own home gardens/farms. Short-term nutritional objectives are for schools to produce food that will supplement school feeding programs and to encourage the consumption of fruits and vegetables among students. In doing so, school feeding programs aim to address the micro-nutrient deficiencies of students through sanitary cooking practices that incorporate a balanced diet, an objective that is particularly salient in SSA where the majority of primary school children in nations such as Tanzania (86%) and Ghana (63%) have parasitic helminth infections such as anaemia. (Partnership for Child Development, 1998; Pretty, 2000).

Three other major objectives of the FAO policy are to decrease school fees for students through the selling of produce, to lower costs of school feeding programs by

supplementing school meals with produce generated by schools, and to generate income through the selling of produce. Two strategies for accomplishing these objectives are to impart agricultural skills and knowledge to students and to foster their personal and social development through the relations they form with communities, teachers, and their peers. By impacting student learning and also cultivating their relationships with community members, FAO rationalizes that the knowledge gained by students will benefit from the “multiplier effect” when it is transferred to parents and families, thereby enabling them to begin and/or improve home gardens/farms, increase outputs, and diversify crops with the information disseminated through the school-aged children (Food and Agriculture Organization of the United Nations, 2004).

Evidence and Circumstances Which Favor Such Approaches

This FAO approach is one of the policy options receiving more attention because of the problems presented by globalization, such as climate change, trade restrictions, and disease outbreaks, which require the lessons of science and agroecology to be applied to local contexts (Gwekwerere, Zesaguli, Schwille, & Hamilton, 2009). Despite school cultivation initiatives in SSA having failed primarily due to poor implementation, donors and governments presume that these problems can be addressed by more effective management and consistent monitoring of projects (Eisemon & Schwille, 1991).

Despite the trend towards the replacement of agricultural education in primary and secondary schools in SSA in the 1990s and 2000s due to the prioritization of basic education (United Nations, 2010), school cultivation continues to be advocated today because of support from findings of studies in the United States, the United Kingdom,

and SSA that school gardens/farms can have positive educational⁴ and economic benefits. Some of the economic benefits that have been observed include: (a) schooling on agricultural productivity has been found to increase students' capacity to use modern agricultural inputs (Eisemon & Schwille, 1992) and (b) four years of basic education raises agricultural output by 13% in developing nations, especially when modern agricultural practices are introduced into basic education (Jamison, 1982; Moulton, 2001).

School cultivation initiatives have also resurfaced because studies have demonstrated that school-community relations can be positively shaped through the use of such programs (Desmond, Grieshop, & Subramaniam, 2004). Most of the studies examining the impact of school farms/gardens on student learning have been conducted in the United States, where there have been three waves of school gardens.⁵ In their review of 190 studies of school gardens/farms from 1960-2002, of which the majority were conducted in the United States and the United Kingdom, Dillon, Rickinson, Sanders, Teamey, and Benefield (2003) found that school gardens and farm projects raise academic performance on standardized tests, improve attitudes about the environment, and strengthen relations between schools and communities through increased parental involvement and pride in the school and community and through the cultivation of student and community leadership skills (see also Canaris, 1995).

⁴ For a summary of the educational benefits of school cultivation please refer to the section "Why Are School Cultivation Initiatives Resurfacing?"

⁵ The three waves of school cultivation in the United States occurred at the following times: in 1916 to contribute to food during World War I, from 1964-1975 as a component for addressing the "War on Poverty," and in the 1990s as a strategy for using innovative methods of learning (Desmond et al., 2004).

Support for school cultivation in SSA has also been generated because limited regional studies have reported positive effects from school cultivation on academic performance and community development. Horst, Morna, and Jonah (1995) found that children in schools in Niger and Sierra Leone who participated in hands-on gardening classes were more inclined to help with work on the farms of their parents and had more positive perceptions of agriculture. Eisemon and Nyamete (1988) learned that teaching students how to use modern production technologies contributed to agricultural productivity in Kenya. In another Kenyan study, Foeken, Owuor, and Mwangi (2007) found a positive relationship between school performance and schools with feeding programs that used school cultivation to supplement the meals. Further evidence from Tanzania and Cameroon indicates that the inclusion of agricultural and scientific instruction in rural schooling can improve academic achievement and, consequently, improve opportunities for secondary education (Bude, 1985; von Freyhold, 1979).

One way to increase the legitimacy of school cultivation in SSA is insert it into the national curriculum. For example, Foeken et al. (2007) found that school cultivation programs in Nakuru, Kenya were implemented only after agriculture was required as a subject by the national curriculum in 1986 and became an examinable subject. The authors learned that one of the main reasons crop cultivation was dropped later in Kenyan schools was because agriculture was removed as a subject in the national curriculum in 2002. More generally, across countries, the likelihood of agriculture being added as a subject in the national curriculum has been diminished in recent years because of the emphasis on basic education by international funding agencies, especially in primary schools (United Nations, 2010). In light of this trend, an alternative method by which to

increase the value of school cultivation for SSA rural school and community stakeholders is to train teachers to link work in school gardens directly to school subject learning. This can potentially raise passing rates on national examinations, enable students to transition into advanced years of schooling, and facilitate their development of inquiry-based farming skills that can be directly applied in their farm work so as to supplement their incomes (Moulton, 2001).

In particular, to raise passing scores on national exams, one approach is to design and distribute school cultivation textbooks and teaching resources that directly support national curricula and standards. Garden literature from the United States offers examples of broad regional efforts that have accomplished this goal. For example, Azuma, Horan, & Gottlieb (2001) showed that a major factor contributing to long-term success for school garden programs in Los Angeles was that school garden activities were integrated in the curricula at each grade level.

Another reason for the reemergence of school cultivation initiatives is the growing recognition that hands-on experiential methods are effective for promoting student learning. A growing body of research indicates that the traditional methods of instruction in SSA classrooms of lecture and rote memorization result in students being disengaged from school learning because of the failure to connect what is learned to a real life context that is meaningful to students (Taylor & Mulhall, 1997). Although the integration of school subjects with agriculture and the use of school gardens/farms as a learning laboratory have been tried as strategies for improving student learning in SSA

countries previously,⁶ a major reason for the reemergence of such approaches in global policy today (Food and Agriculture Organization of the United Nations, 2004) is educational research reaffirming the value of hands-on instruction methods to promote student learning (Desmond et al., 2004; Piaget, 1972; Vygotsky, 1978; Williamson & Smoak, 1999).

In addition to support from classic empirical studies unconnected with school cultivation that have shown that active learning has significant educational benefits for children (Piaget, 1972; Vygotsky, 1978), FAO's (2004) policy push for hands-on instructional methods has been supported by recent school cultivation studies. Stoddart et al. (1999) conducted a seven-year study of school cultivation programs that trained teachers to use experiential learning to teach science and language in 51 California elementary schools, where the majority of learners were Hispanic. The authors discovered that student learning advanced more quickly when school gardens were used to teach reading and math. In another U.S. study, the Bethel Learning Institute documented different student retention based on teaching method, with 11% retention for lectures, 75% retention for learning by doing, and 90% retention for students teaching other students. The study also found that, when children work in gardens, 90% of their experience is hands-on (Sealy, 2001).

School cultivation is also resurfacing because empirical research showed positive effects of such programs not just on school subject learning, but also on health and nutrition. Morris, Briggs, & Zidenberg-Cherr (2000) showed that linking school gardens

⁶ Gardens were used for observation and experiments in the "Nature Studies" curriculum of British colonies, and the "Sciences d'Observation" syllabi of some francophone countries including observational lessons related to agricultural topics (Riedmiller & Mades, 1991).

to nutrition education can lead to significant, healthier changes in student eating behaviors. In the context of developing nations, several studies have indicated that improved nutrition of students is correlated with improved academic performance (Levinger, 1986). In their evaluation of school feeding programs in Jamaica, Grantham-McGregor, Chang, and Walker (1998) found that the provision of school meals, and in particular breakfast, improves learning because students spend more time on task after eating. In SSA, Foeken et al. (2007) compared a treatment group of schools with gardens/farms to a control group of schools that did not have cultivation programs in Kenya and found that there was less growth stunting and weight deficiencies of students participating in schools with cultivation and feeding programs. Surveying 300 schools in Tanzania, Riedmiller (2002) also found that providing school lunches increases attendance.

School cultivation also continues to be recognized as a viable method for training youth in rural communities to develop important skills needed for cultivating self-sustaining communities. In McDonough & Wheeler's (1998) study on community forestry in Thailand, the authors endeavored to understand how communities view school involvement in forestry issues in Thailand. The authors found that important leadership and technical skills are created when students are able to apply academic knowledge practically as they engage with local problems. In the Food and Agricultural Organization's work with Junior Farmer Field and Life Schools in Tanzania, a participatory educational methodology was used. It was found that this methodology provided meaningful communication by which student-participants learned how to

problem solve about agriculture and health-related issues (Djeddah, Mavanga, & Hendrickx, 2006).

Continuing Donor and Policy-maker Support for School Cultivation

School cultivation continues to be initiated in SSA schools not simply because of favorable research, but also because international institutions and donor agencies like 4-H and FAO have become convinced of its potential to improve education and address food insecurity. Donors also support school cultivation in SSA because they regard it as a tool for addressing multiple goals of rural development such as natural resource management, social development, the learning of nutrition, the introduction of modern agricultural practices, and the development of ecological literacy and sustainable practices (Food and Agriculture Organization of the United Nations, 2004; Riedmiller & Mades, 1991).

National governments, in turn, lend their support to such policies, in part, because the appeasement of rural voters garners sustained support for an administration's political power (Sinclair & Lillis, 1980). In addition, international pressure and foreign aid earmarked for the provision of particular services are inclined to be accepted by resource-constrained ministries under the conditions imposed, as long as the proposed programs are perceived to improve structures, components, or processes of rural communities (George & Sabelli, 1994).

Still another reason school cultivation initiatives are currently resurfacing in SSA is because schools continue to be recognized by governments and donors as established public institutions that can be used to disseminate information to address communities' short- and long-term food security and educational needs. Already SSA schools are centers of many activities, such as meetings of women's groups, literacy classes,

extension work, and events such as community functions (Moulton, 2001). Although extension workers are generally relied upon by SSA governments in order to address agricultural issues in rural communities, their messages can also be reinforced by repeating these messages for school children (Bergmann, 1985). School cultivation approaches in SSA that prioritize the transfer of agriculture knowledge are viewed by donors to have value, in part, because of the reported deficiency in SSA about awareness of farming as an important element of the food web (Webb & Bolt, 1990). In fact, from the donor point of view, gardens/farms in SSA schools are especially desirable because they can address two of the most central objectives of modern development projects: active participation of the rural populace in development programs and development initiatives that promote their empowerment (Atchoarena & Gasperini, 2003; Bergmann, 1985; Desmond et al., 2004; Moulton, 2001; Phillips & Roberts, 2010).

The research also indicates that school cultivation programs are more likely to succeed when partnerships are formed, not only with ministries of education and external donors, but with local stakeholders such as agricultural extension workers, local institutions, and community members (Moulton, 2001). For example, in a survey and case study evaluation of school cultivation programs in Los Angeles, Azuma et al. (2001) found that schools with long-term programs still in operation attributed their success to a wide base of support from teachers, administrators, parents, and community volunteers who were continually involved and who offered support and guidance. Although the research indicates that participation of local stakeholders in the planning process and throughout the project cycle is needed so that information about mutual needs and interests can be shared and so that information about needs can be used to inform

program objectives and procedures, there is limited research indicating how such partnerships can be effectively developed in SSA school cultivation initiatives (Moulton, 2001).

Donors also recognize that school cultivation can generate income that can help to pay for recurrent school expenses such as feeding programs and school fees (Bergmann, 1985). For example, in Tanzania, during its post-independence period of socialism and self-reliance, financial output from primary schools, secondary schools, and teachers' colleges accounted for 7.2% of recurrent expenditures (Kassam, 1994). Furthermore, donors also recognize the potential of school cultivation to be a low-cost approach for teaching scientific content such as biology, physics, and some chemistry. This tendency toward low cost is a result of the fact that the teaching of science through farms/gardens has the potential to require the use of only the existing resources available within communities, aside from teacher training, manuals, and textbooks (Bergmann, 1985).

There is also the tendency for such initiatives to be supported by SSA teachers as a means of supplementing their meager salaries (Bergmann, 1985). For example, in a study comparing schools with school cultivation and feeding programs to schools without them in Nakuru, Kenya, Foeken, et al. (2007) found that teachers benefited as much from school meals as students. Most of the milk from cows was distributed to the teachers.

On the downside, SSA teachers have been found to have low motivation for additional tasks outside of those which they are paid to do (Riedmiller, 2002); thus, the use of child labor to produce agricultural goods is likely to continue to be utilized - and possibly exploited (O-saki & Agu, 2002) - by teachers for their own benefit unless there is monitoring of the effectiveness of such programs.

A Brief History of School Cultivation in Sub-Saharan Africa and the Unique Case of Tanzania

Agriculture was widely implemented in SSA schools throughout the colonial period and by emerging nations after independence. Emphasis on adapting school curricula to the needs of African rural communities began as early as 1922 with the Phelps-Stokes Report's⁷ (Lewis, 1962) recommendations for education in SSA because "the African natives are relatively more dependent on agriculture than other people in the world." This report strongly influenced British colonial educational policies, which initiated pilot projects of community-oriented education in Kenya, Nigeria, and other territories (Riedmiller & Mades, 1991). While access to British education was restricted to white settlers and Asian ethnic minorities, segregated schools were established for African pupils where a large portion of weekly school instruction was designated for agricultural lessons and farm activities. These colonial school cultivation policies created inequitable learning opportunities for African students, who were unable to advance to the upper levels of education as a result of the schools' focus on food production. It was perceived by Buchert (1994) that these students were not sufficiently prepared for national exams due to the emphasis on vocational subjects such as agriculture in lieu of academic subjects.

⁷ This summary of SSA school cultivation history pertains mostly to Anglophone countries in Africa due to a bias in favor of British colonialism in SSA school agriculture literature (Riedmiller & Mades, 1991).

After independence of Tanzania in 1961 and of other SSA nations subsequently, Africanization⁸ of the school curricula in history and geography was implemented by the newly formed governments. However, content of the colonial curricula in other subjects, such as the school subject of agriculture, was retained so as to create skilled manpower that could replace the European colonial administrators. During the 1960s and 1970s throughout SSA a rigid curriculum for teaching agriculture as a separate subject was maintained by educational ministries. But unlike other SSA nations where localization of the school curricula in rural schools was resisted by the ministries (Boyd, 1996), Tanzania's approach was unique. In 1961 Tanzania attained its independence and, under the leadership of its first president, Julius K. Nyerere, the government proposed an Education for Self-Reliance (ESR) policy in 1967 that used the school farm to strengthen the role of students in contributing to national development through learning by doing. For Nyerere, the rationale for this initiative was that each school's teachers and students were a social unit tied to the national economy and that the students would contribute to the school's upkeep through farming and other activities, and thus contribute to the wellbeing of the nation through their work. Experiential learning activities were emphasized in the farm classroom (*shamba la darasa*), such as learning about the importance of hard work through labor activities, using simple tools like the hoe, and covering scientific concepts like the advantages and disadvantages to fertilizers, soil conservation, terracing, and appropriate grazing of livestock. Another main objective was to teach students about how increasing production makes their lives better in a

⁸ "Africanization" refers to the process by which knowledge pertaining to Africa becomes more African. This term emanated during the 1960s when university colleges were created in Africa following independence and African history was introduced in American and British universities (Brizuela-Garcia, 2006).

quantifiable and self-sufficient way. The aim was for students to learn the value of increasing production through developing knowledge about the appropriate inputs to apply in order to generate income (Farming Could be Lucrative, 1967).

Nyerere's view was that, under the British colonial system, education had only been provided to the elite,⁹ while Tanzanian students had only been able to work to feed the elite through agriculture labor activities in schools. He argued that the school curricula under the British system had prioritized the learning of information in books that was not relevant to Tanzanian students in their daily lives and that the traditional role of the elders in the educational process had been devalued (Nyerere, 1967; Phillips & Roberts, 2010). During this ESR period, which lasted in theory at least until 1985 when Nyerere retired, teachers permitted student teams to be used in the villages in private farms or construction projects. Profits from this work were allegedly used by the schools, but likely also misappropriated by teachers, as was found in interviews conducted by Phillips & Roberts (2010).

By the early 1980s Tanzania's economic situation was becoming worse and worse. The country suffered bankruptcy as a result of a global recession but also because of unsound domestic policies (Economic and Social Research Foundation, 2003). Unable to sustain spending on education and social services, Tanzania initiated its Structural Adjustment Programme under the conditions established in conjunction with the World Bank and the International Monetary Fund in 1982.¹⁰ During this time, equity and access were no longer prioritized in educational policy (Buchert, 1994) and, as a likely

⁹ See chapter 3 for further reference.

¹⁰ See chapter 2 for further reference.

consequence, school enrollment numbers dropped severely when the onus of payment of school fees and the feeding of students was placed on families (Phillips & Roberts, 2010). Due to the many failures resulting from curricular constraints for the teaching of agriculture such as a lack of textbooks, a lack of modern inputs, and a lack of adaptation to local conditions, the teaching of agriculture as a separate subject was dissolved, as it was in other SSA nations during the 1980s and 1990s (Boyd, 1996).

In the new century, as discussed above, school cultivation has again reemerged as a policy option in SSA as a likely consequence of the influence of FAO policies and support from donors such as 4-H and the World Food Programme (WFP).¹¹ However, the negative stigma of agriculture in SSA schools continues to influence the views and positions of the SSA rural populace because of its association with racialized colonial policies. Since school cultivation policies in SSA remain a source of contention (Kassam, 1994), a common response to the perceived inequities of rural school agriculture has been pressure from citizens for SSA educational ministries to reestablish centralized standards. By doing so, the *same* educational content has been and continues to be taught nationwide - to rural as well as urban students - and students can be evaluated more equitably on national examinations.

Why School Cultivation Failed in the Past

Historically, school cultivation initiatives have not been sustained in SSA because they are perceived to be in conflict with one of the main reasons parents enroll their children in SSA schools: to adequately prepare students to advance to upper levels of

¹¹ As one element of the community contributions to its Food for Education (Iliffe, 1979) school breakfast and lunch programs in SSA, World Food Programme requires cultivation of a school farm (World Food Programme, 2006).

education which will enable them get better public or private employment. While SSA cultivation initiatives have endeavored to coordinate the participation of students in the agricultural work of their communities, the tendency has been for these activities to be devalued by parents and students because of the perception that agricultural activities detract from time in schools that could otherwise be devoted to relevant subjects that would improve performance on competitive examinations (Lewin, 1993; Ozer, 2007).

Almost 50 years ago, in his influential study on the “vocational school fallacy,” Foster (1965) found no evidence in his research in West Africa that vocational educational activities in schools, such as agriculture, carpentry, or masonry, are linked to economic development. He stated that this was because parents and students perceived education as a gateway out of poor prospects in rural areas and into the modern sector:

So long as parents and students perceive the function of education in this manner, agricultural education and vocational instruction in the schools is [sic] not likely to have a determinative influence on the occupational aspirations and destinations of students (p. 151).

He found no evidence that young peoples' attitudes towards different kinds of rural work could be changed so as to view employment in rural areas more favorably. Instead Foster contended that vocational programs cannot change the students' devaluing of job opportunities in farming and other trades they have in rural areas. Such student attitudes in his view were determined by the labor market not by schools. For him, this was an insurmountable reason for school farming programs to fail.

These attitudes on how to qualify for better jobs also provide support for the national examinations. Obtaining high scores on national examinations is viewed to be of

great importance because high-scoring students can be selected for promotion into more highly-regarded, formal public and private secondary and tertiary institutions (Eisemon, Prouty, & Schwille, 1992; Knamiller, 1983). It is thought that higher levels of educational attainment are required in order for students to find a better life off of the farm. Contributing to this viewpoint are the significant disparities in SSA between the earnings of the modern and traditional sector, urban and rural incomes, and wage and agricultural labor (Eisemon & Schwille, 1991; Sinclair & Lillis, 1980; Taylor & Mulhall, 1997).

School cultivation initiatives have also faced opposition in SSA due to the scant evidence that school agriculture curricula increase rural employment, build model villages, or foster innovation in rural communities (Bergmann, 1985; Knamiller, 1983). One reason for this failure is the dominance of certification in SSA education. This prioritization contributes to urban migration by allowing successful students to pursue more advanced years of schooling in cities.¹² In the many cases where attempts have been made to “ruralize” the school curriculum in order to utilize and reappraise local traditional farming practices and crops, agriculture has generally remained a separate subject that has been isolated from other learning activities, and teachers have been required to follow prescribed curricula when teaching this subject (Bergmann, 1985; Eisemon & Schwille, 1991; Kassam, 1983). One result of this curricula has been that the most successful crops are often ignored and local practices are replaced with “modern”

¹² In SSA urbanization is occurring at an estimated rate of 3.3% yearly (Gore, 2008). Employment opportunities in rural areas are reduced as a likely consequence of the rural population decreasing.

agricultural methods, such as the use of agrochemicals and monocultures.¹³ Within these reforms, SSA schools also continue to adhere to the traditional school farm goal of production, which had been established under colonialism, resulting in students often being required to conduct repetitive labor tasks lacking in educational value and that fail to capacitate students to acquire additional skills (Lewin, 1993). This tendency toward production rather than education has contributed to a negative stigma of agriculture in schools as merely a method of food production that is disassociated from classroom teaching and learning (Gwekwerere et al., 2009; Riedmiller & Mades, 1991).

The negative perceptions of the importance of school cultivation initiatives in SSA have also been fueled by the lack of pedagogical competence of teachers and teacher trainers. The research indicates that, even with the highest-quality curriculum and teaching material available, successful school cultivation projects in SSA are contingent upon capable, motivated, and creative teachers that are able to teach with limited resources (Riedmiller, 2002). However, school cultivation literature indicates that SSA teachers have often used gardens/farms as a disciplinary measure or have forced students to work long hours to produce food consumed mostly by school staff (Freiburg, 2002; O-saki & Agu, 2002).

Another reason for these programs' failure is that the complexity of agricultural education has typically not been recognized in SSA teacher-training institutions. Agriculture has been taught too inflexibly at the teacher education level, with prescribed methods for teachers to follow and preformed materials for student to learn (Eisemon et

¹³ One example is the Ruralization Reform of Burkina Faso from 1979-84, where schools reported that school agricultural activities were poorly adapted to the environmental conditions of local environments, such as schools not establishing orchards in fruit-growing regions (Riedmiller & Mades, 1991).

al., 1992; Riedmiller & Mades, 1991). This is despite the fact that the research indicates that effective teaching of agriculture requires teachers to use skills in addition to traditional “talk and chalk” methods of lecture and rote memorization. For instance, in order to successfully teach agriculture, teachers must have: (a) technical knowledge about agricultural production, (b) organizational skills, (c) an understanding of the scientific foundations of agriculture, and (d) enough scientific competence that they have the capacity to teach students how to use the scientific method, and (e) they need to be good farmers themselves (Gwekwerere et al., 2009).

Since agriculture is not currently being included as a separate subject in SSA curriculum, SSA teachers in recent times must also learn how to integrate agriculture with the teaching of other school subjects that are included on national exams. To build the capacity of teachers to accomplish these numerous objectives requires additional resources for pre-service or in-service teacher training, such as agricultural extension workers or staff from regional educational ministries to provide on-the-job training. However, agricultural extension workers are typically not drawn upon as a resource in SSA school cultivation projects because of the lack of coordination between the different ministries at the national level (Eisemon et al., 1992). Support from regional educational experts is also made challenging due to financial and time constraints, such as having to travel long distances to visit less-accessible rural schools.

For these reasons, support systems for teachers at regional levels in SSA that provide expertise in pedagogy are typically in short supply (Bergmann, 1985). Even when teachers are trained effectively, programs may still fail when SSA teachers are not compensated for their extra work (Foeken et al., 2007; Ozer, 2007). Sinclair and Lillis

(1980) note that, in general, the nature of training for teachers in low-income nations includes intensive pre-service and in-service training programs followed by dispersal of the trainees back to an unreceptive environment at their schools with little follow-up provided.

School cultivation programs have also failed because of lack of resources. When funding is inevitably withdrawn by governments and external funding agencies, these programs report major logistical challenges including (a) a lack of tools and machinery, (b) a lack of management expertise, (c) a lack of teacher training and materials, (d) no access to water, (e) no access to appropriate land to be cultivated successfully, (f) a lack of transportation of products to an accessible market, and (g) a lack of soil inputs such as fertilizers (Gwekwerere et al., 2009; Lewin, 1993; Riedmiller, 2002). Even when rural development policies in SSA continue to be supported by external institutions, the goals of these donors often fit inappropriately to the needs of community stakeholders (Pretty, 2000). Dependency on these funding agencies may also interfere with the food security of rural communities in the long-term because food habits may be changed from what is locally grown as a result of the farms' production (Riedmiller, 2002). The conflicting goals of the community with those of external stakeholders often prevent the development of local strategies to maintain the school's plot of cultivation as a permanent component of educational instruction (Desmond et al., 2004; Vandenbosch, 2009).

Additionally, since school cultivation programs may employ developmental strategies across multiple disciplines such as education, community development, agriculture, or health, they are less likely to secure support from foundations or aid

programs. While a common strategy for educational initiatives in SSA rural communities is to require community members to raise additional funds or provide unpaid labor, this requirement has often been met with resistance in impoverished communities (Lewin, 1993), especially because school expenses can be as high as 20-30% of SSA household expenditures (Eisemon & Schwille, 1991).

School cultivation initiatives also fail because one of the major objectives of SSA school cultivation initiatives—the significant contribution of families of students to initial and recurrent costs of schooling—is often unmet. The reality of school agricultural production, aside from a few specific cases where schools have been able to self-sufficiently provide food for school feeding programs for the entire year (Foeken et al., 2007), is that the use of farms/gardens by schools may only modestly contribute to the costs of schooling through the selling of produce or the supplementation of school feeding programs (Bray & Lillis, 1988). This is more salient in SSA in recent years because school enrollments have rapidly increased as SSA nations endeavor to achieve universal primary education by 2015 (United Nations, 2010) and also because there have been insufficient rains as a likely consequence of global warming (United Nations Environmental Programme, 2008).

School cultivation also fails in SSA because of the inability of such programs to contribute to community development. The agricultural goods produced by schools may compete with the goods produced by skilled farmers in the rural communities and the school programs are often perceived to be threatening to their livelihood. These stakeholders may therefore be reluctant to support school cultivation programs or participate by providing technical expertise (Lewin, 1993). Furthermore, the common

goal of many SSA school cultivation initiatives of having students advise their families and communities on the use of improved agricultural methods is likely to be “unanimously rejected” in most African societies because of the traditional SSA role of children: to silently respect and obey (Riedmiller, 2002).

Methodological Shortcomings of Studies on School Cultivation and Unexamined Questions in the Research

Although it has been reported in school garden literature that school cultivation programs make a difference for students and schools (Ozer, 2007), few studies have been designed to optimally examine the effects of school gardens/farms (Dillon et al., 2003; Morris, Briggs, & Zidenberg-Cherr, 2000; Ozer, 2007).¹⁴ Most of the school garden

¹⁴ The most-used references for this chapter are: (a) the seminal, peer-reviewed articles of Sibylle Riedmiller, because she uses a macro-perspective to summarize general findings about primary school agriculture policies in SSA throughout the late 20th century and is one of the only authors that has analyzed the logistical and financial challenges of school cultivation initiatives in order to explain why such programs have frequently failed, (b) articles by Thomas Owen Eisemon and J. Schwille, which have served to provide specific examples illustrating Riedmiller’s broad overview of SSA school cultivation policies through examining post-colonial policies in Burundi and Kenya during the early 1990s, which required agriculture programs to be implemented in schools nationwide, (c) a thorough review of the literature of school cultivation studies conducted in the United States and the United Kingdom, conducted by Dillon et al. (2003), which offers a thorough critique of the methodology used in school cultivation studies by examining the effects of “garden-based learning” on students and communities in these countries through utilizing a wide variety of measures including health, nutrition, social relationships, academic achievement, community and parental involvement, and leadership skills, (d) the empirical study designed by Liberman et al. (2005), which is one of the few studies that has used rigorous methods for examining the impact of school cultivation through using a large sample size of treatment and control schools (146 total schools), and a follow-up study conducted five years later to examine the effects of environmental education on student achievement in California, where they found that students in schools with environmental programs performed equal to or better than their peers because they took an active role in their studies, teachers were found to connect school gardens to state standards in multiple disciplines, and because teachers also used multiple assessment methods for assessing student performance in addition to standardized tests, such as self-evaluation rubric assessments and portfolios, and (e) the

literature has concentrated primarily on instructions for initiating and maintaining school gardens, how teachers can make connections to classroom learning, and young people's perceptions about food, farming, and land management (Dillon et al., 2003).

While a select group of studies examining school gardens/farms have utilized control groups (Lieberman, Hoody, & Lieberman, 2005; McAleese & Rankin, 2007), these studies have generally been short term,¹⁵ and the methodology has consisted of anecdotal data that includes mainly subjective responses about perceptions of the importance of school cultivation in the form of self-reports, observations, and empirical examinations of the impact of school gardens that are limited in scope (Lieberman & Hoody, 1998; Lieberman et al., 2005). Most studies have lacked rigor, have had insufficient sample sizes, contained only superficial descriptions of events, ignored issues of validity and generalizability, and made conclusions that have not been adequately supported by their data (Dillon et al., 2003; Flanagan, 2010; Ozer, 2007).

One difficulty in conducting controlled, empirical research of multiple schools on this topic is that there is great variation in the programs, in the involvement of students and other stakeholders, and in the integration of these programs with the regular school curriculum (Ozer, 2007). Many important questions remain inadequately addressed by the research. Some of these questions include:

work of Desmond et al. (2004), which traces the origins and history of school cultivation and analyzes school garden literature programs in contemporary times in order to determine how to improve student learning in response to contemporary (2004) FAO school cultivation policies.

¹⁵ One exception to this is a study by Morris et al. (2000) which investigates vegetable-preference of U.S. elementary school children over a period of six months.

- What aspects of school cultivation programs produce positive effects?¹⁶
- What are the factors shaping teachers', students', parents', and school leaders' attitudes toward food and farming, and what factors influence how these perceptions can be shaped?¹⁷
- What strategies for training teachers to use active learning methods in school cultivation programs in SSA are most beneficial and cost-effective?¹⁸
- How can the capacity of other stakeholders be strengthened in the process?¹⁹

¹⁶ While results from studies generalize about the positive impacts of school cultivation programs, the identification of components of specific school cultivation programs that achieve positive impacts remains understudied (Desmond et al., 2004; Dillon et al., 2003). Examining the elements that contribute to these programs' success would be beneficial to the design of appropriate school cultivation models by the international donor community in SSA and other developing countries. One example is the design of studies that seek to identify the components of school and community leadership that influence and shape school cultivation effectiveness.

¹⁷ While attitudes and perceptions of stakeholders have been the focus of the majority of studies examining school cultivation (Dillon et al., 2003), studies examining how their views are formed and can be changed longitudinally over time will disclose information about the elements of such programs that affect the views of stakeholders and changes in the value they place on such programs.

¹⁸ Although experiential learning is favored as the instructional and curricular strategy in developed nations, and although there is a growing interest in its importance in developing nations (Food and Agriculture Organization of the United Nations, 2004), the processes for how to effectively train teachers to utilize hands-on instruction in order to improve student learning have not been rigorously examined. Studies examining this question are important in order to identify low-cost methods for training teachers that can improve student learning.

¹⁹ In many school cultivation projects a major goal has been to build capacity at different levels. One example is the Healthy Learning Programme in Kenya (Vandenbosch, 2009). How stakeholders such as extension workers, community leaders and the rural populace can be involved in gardens/farms so as to contribute effectively remains under-examined. Answers to these questions will provide information about how to appropriately incorporate community stakeholders in school cultivation projects.

- How can initial and recurrent costs for school gardens/farms be minimized or even eliminated?²⁰
- Can school cultivation be appropriately placed in school curricula in SSA schools while not acting in opposition to the current investment focus of basic education valued by the international community?²¹

Conclusion

This chapter explains how SSA school cultivation policies have frequently failed to establish and maintain a balanced representation of the views of all stakeholders in project implementation. As Phillips (2009) has shown in rural Tanzania, without addressing fairness in the design of SSA food security policies for all stakeholders involved, this approach often results in the inequitable distribution of food in SSA due to political and economic factors. One consequence has been that the hierarchies of power and impoverishment in SSA communities have been reinforced. For example, teachers have frequently utilized a higher percentage of the goods produced than students (Foeken et al., 2007) and community stakeholders have not been shown to benefit from such projects by being equipped with additional agriculture skills and knowledge because of

²⁰ In reforms endeavoring for communities to learn new knowledge, there are always transaction costs such as developing technologies and training stakeholders (Pretty, 2000). A thorough examination of how schools in communities in SSA nations with self-sustaining school cultivation programs such as those identified in Tanzania by Foeken et al. (2007) maintain financial stability can serve as a strong foundation by which to compare the progress and development of other SSA schools that initiate school cultivation programs.

²¹ While the World Bank and other international lending agencies are opting to increase primary school access and focus on the education of students in basic skills, the use of school cultivation to enhance basic education curriculum in SSA has not been adequately examined. Inquiries exploring this question are important because they will help to indicate whether school cultivation can be used as a tool for advancing the current educational priorities of international aid agencies.

existing cultural norms (Riedmiller, 2002). Thus, the agriculture for production model in SSA schools has been shown to insufficiently address poverty reduction, rural development, and sustainable resource management in contemporary SSA. A major reason for the failure of school cultivation initiatives is the lack of attention paid to food sovereignty, or the right of people to define the foods they wish to produce and consume and develop their own systems for doing so (Menezes, 2001).²²

However, this chapter has also highlighted the fact that, under FAO's proposed school cultivation policies in developing nations, school cultivation initiatives have the potential to contribute to food sovereignty of rural societies through imbedding a participatory process. Furthermore, this chapter has seriously taken into consideration Amartya Sen's (1998) description of how the capabilities of each person (i.e., agency as in Farmer (2003)) are often constrained in the provision of basic health and education in developing nations. If projects were administered according to the food sovereignty equity principle and if school cultivation curricula were designed appropriately and resources and training were provided to enable educators to use school farms/gardens to promote student learning, the research suggests that such programs would enhance the development of SSA rural communities.

²² While a major goal of British colonial rule was for SSA schools to be self-sustaining through agricultural production, the surplus goods were used as a means of contributing to the Empire's profit. In the context of post-colonialism, during Julius K. Nyerere's presidency in Tanzania after independence, one of his policy goals was to create self-reliant rural communities. However, this goal was not achieved as much as it was desired because the primary focus of school farms remained on production in order to help pay for recurrent school costs and because the labor of students was commonly exploited by teachers on work teams (Phillips & Roberts, 2010).

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CHAPTER 2

Window into the National Context of Primary Education in Tanzania

This dissertation investigates the use of school gardens and farms in two Tanzanian state primary schools, but it also uses these projects as a window into understanding the general nature of Tanzanian schooling. In order to understand the overall context of education in Tanzania, this chapter surveys the educational history of Tanzania during colonialism, after independence, and then in contemporary times. It analyzes reforms during these periods in relation to issues of equity and educational quality within Tanzanian state primary and secondary schools. The chapter then concentrates on two major, recent reforms of Tanzanian state primary and secondary schools initiated after the turn of the millennium: the Primary Education Development Plan and then the Secondary Education Development Plan. An analysis of the impact of these reforms as pertaining to teaching and learning within Tanzanian public classrooms is then conducted. The chapter finishes by discussing how this dissertation complements two influential books investigating issues of educational quality and the delivery of educational services in Tanzania.

Tanzania's Modern Educational History

Tanzania's early educational history was strongly influenced by the involvement and interests of the groups funding and establishing Tanzanian schools, and the consequences of these early establishments are still visible in the educational context today. In 1919, after the defeat of the Germans in World War I, Christian missionaries under British rule established schools in Tanzania as a means of obtaining converts. Under colonial rule, religious financing of schools continued, while government funding

for education remained low. For example, in 1923-24, the financing of education was approximately one percent of the government's budget. Although the funding for education rose to 8% in 1931-2, this increase was cut back in the early 1930s due to the Great Depression. As a result of this reduction, the majority of schools in Tanzania were private, established and operated by Christian missionaries, until independence was achieved in 1961. Since these schools were concentrated in areas with high cash crop outputs like coffee production, such as Kilimanjaro and Bukoba, this led to regional inequalities. Many areas throughout the country did not have access to educational facilities during this time because the colonial rule was concentrated on the coast and in areas of the north with more available resources such as Kilimanjaro.

A racial imbalance was another outcome of the privatization of Tanzanian schools by Christian missionaries. For example, although the vast majority of the population was African, only 1.8 % of the African population was enrolled in school in 1933. In contrast, 51 % of Europeans and 49 % of Asians²³ had access to schooling. This was unsurprising, as tuition fees were often required in order to attend the few schools that were available. While per capita spending for a European student in 1933 was 38 pounds, 4.4 pounds were spent on Asian students and 1.9 pounds were spent for African students (Lwaitama, Mtalo, & Mboma, 2001).

When independence was achieved from Great Britain in 1961, Tanzania's first administration prioritized readdressing these inequitable regional and racial imbalances in education. Under the direction of its president, Julius Kambarage Nyerere, all primary

²³ After Tanzania became a British colony in 1919, people from India that were previously living in Zanzibar came to Tanzania and dominated the commercial sector, while Africans were not permitted to participate in trade (Lwaitama, Mtalo, & Mboma, 2001).

schools were nationalized, and the goal of achieving Universal Primary Education (UPE) was established. The government began by opening schools in regions where there were previously no schools (Lwaitama et al., 2001). A new law, established in 1969, also stipulated that all primary school teachers must be Tanzanian citizens. This law also required all schools—including secondary schools—to have advisory committees selected by the government, while all primary boarding schools—these institutions had been almost completely comprised of Europeans and Asians during colonial rule—were to be phased out. Furthermore, the government provided funding directly to communities for the construction, repair, and maintenance of primary schools. Since villages shared in the construction and maintenance of their schools, however, overall costs to the national government were reduced as the government was able to avoid payments for community labor since community involvement was unpaid (Moore, 1979).

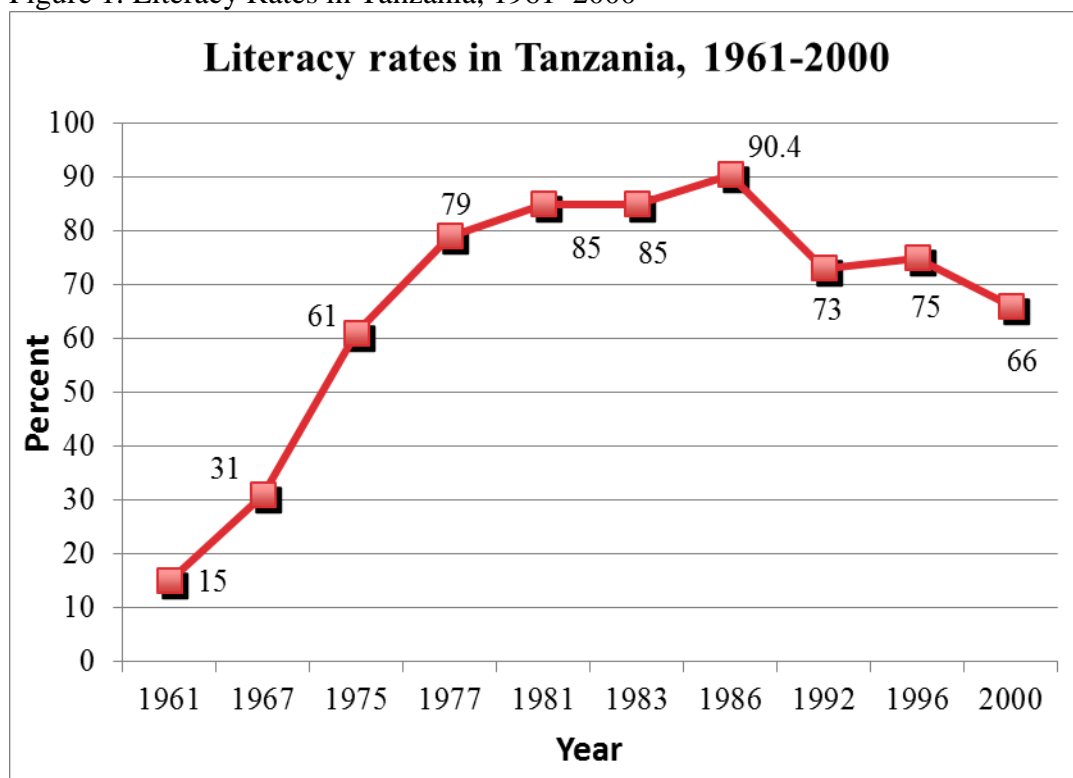
Thus, under Nyerere's directives, the involvement of communities became vitally important for the provision of education in rural areas in Tanzania. Major reformation of rural schools was initiated based on his philosophy of self-sustainable schools and villages. That is, Nyerere believed that in order to be fully emancipated from Western colonialism, schools in Africa needed to be the center of the community and needed to facilitate the process of Self-Reliance so that all of the community's needs could be met by its own agricultural activities (Lema, Omari, & Rajani, 1993). Accordingly, during his presidency, educational programs in Tanzania were reorganized so that practical activities needed for the sustenance of the community became an integral part of the school curriculum. This initiative included the goal of annual training for more than two thousand teachers, the implementation of programs with the goal of achieving universal

literacy and primary education, the decentralization of schools by giving full oversight of schools to District Councils. Tanzanian citizens, especially from urban areas, were encouraged to migrate to rural areas to participate in the agricultural movement (Stabler, 1979). Each school's agricultural output resulted in substantial additional cash revenues for their communities.

As part of Nyerere's Education for Self-Reliance initiative, particularly through the Arusha Declaration of 1967, the government nationalized private schools in seminaries and declared primary schooling to be compulsory through UPE. The educational tier structure of the British was adopted, meaning that primary school in Tanzania included seven years of schooling (Standard I to Standard VII), followed by secondary school for four years (Form I to IV) for those who passed national exams during Standard VII, or year seven. For those who received higher marks on national exams in Form IV, this was followed by two years of A-level, which prepared them for later education in a university or, for those who do not receive higher marks, two years of Sixth Form, where students were prepared for careers in areas not taught in universities, such as teacher preparation. School fees were also abolished, and student entrance to secondary school was determined by examination results. In primary schools, the result was the "increased integration and participation of African students in primary schools that formerly were comprised almost exclusively of Asians" (Msekwa, 1979). During this time, Gross Domestic Product (GDP) allocated to education was increased significantly from 2.7% to 5.7%. This increase in funding also led to an increase in gross primary enrollment rates from less than 50% in 1961 to an estimated 95% in 1976 (Markov & Nellesmann, 2001). Life expectancy rose from 35 to 50 years during this time

period. Also, 79% of the positions within the government were transferred to Tanzanians (Buchert, 1994). As a likely consequence of the 1970 mandate, which set the goal of achieving full literacy by 1975, the national literacy rate climbed from 31% in 1970 to 61% in 1975 (see Figure 1). Due to this rapid success, the target deadline for the achievement of UPE was changed from 1989 to 1977 (Moore, 1979). By 1986 Tanzanian reached a literacy rate of 90.4%.

Figure 1. Literacy Rates in Tanzania, 1961–2000



Source: Mushi, Malekela, & Bhalalusesa, 2002.

Note. For interpretation of the references to color in this and all other figures, the reader is referred to the electronic version of this dissertation.

Depression in Tanzania in the 1980s and 1990s: From High Hopes of Post-Independence to Economic Stalemate

However, as Figure 1 above illustrates, literacy rates eventually declined in the 1990s due to issues with deteriorating educational quality as well as the problems on

unemployment and even the fact that so few could go to secondary school. Although Nyerere's Education for Self-Reliance initiative was an important tool in fostering such values as community cooperation, responsibility, and self-dependence, and although the mandate substantially increased the pool of primary completers in the late 1970s (Msekwa & Amkano, 1979; Stabler, 1979), the newfound hopes generated from educational advances in the decades immediately after independence were short-lived. Due to the massive increases in school enrollment, the educational sector's infrastructure was subjected to severe strains. School quality was compromised because both educational resources and well-trained teachers were in short supply (Tonini, 2010). Also, secondary enrollment rates were minuscule in accordance with ministry policy and much lower than various other sub-Saharan countries.

Furthermore, inefficient, state-owned corporations supported by the government budget led to an economic downturn, which resulted in Tanzania becoming the second poorest country in GDP in the world by the 1980s (Economic and Social Research Foundation, 2003). Drought and flooding, coupled with poor economic management, led to extensive oscillation of export prices and inflation. Due to this economic decline, and also because of poor public sector management,²⁴ primary school enrollment rates dropped to below 80% by the mid 1990s (Markov & Nellemann, 2001). An additional result of the economic downturn was that 80% of both primary and secondary graduates were unable to attain employment in Tanzania's formal sector (Stabler, 1979), even after

²⁴ The bureaucracy of the governing agencies at the local and national levels became shaped by regional and district authorities becoming mini-'governors' of their regions and requiring many tributes. Primary school teachers and service providers were caught in the middle between local government authorities, sectoral ministries and party leaders. These tensions remain interwoven in district and sub-district political structures today despite decentralization initiatives at local levels (Lema et al., 1993).

completing their schooling.

Further accelerating the consequences of this depression was the fact that the percent of total revenues of international aid for education in Africa declined from 17% in 1975 to 10.7% in 1990. The economic decline coupled with the lack of foreign investment in Tanzanian education resulted in per student education spending plunging from \$41 in 1980 to \$26 in 1985, with a small rebound to \$28 in 1995 (Lwaitama et al., 2001). As a result of insufficient funding, there was a failure to finance schooling in many communities, particularly in marginalized rural and urban areas. While the Ministry of Education strove to meet the high demand for teachers through the expansion of education, limited resources were used to train teachers, with only Standard VII primary school qualifications in distance training programs. Wedgwood (2007) argues that, at the same time, the status of the teaching profession declined, accompanied by less-competent pedagogical practices in the classroom and a high level of absenteeism.

The outcome of this low quality of education—which included insufficient classrooms, furniture and textbooks—was high primary school drop-out rates, nearly 40% in some areas, and high repetition rates (Lwaitama et al., 2001; Wedgwood, 2007). Moreover, a shortage of resources available for non-salary expenditures provided by the government resulted in an expansion of school fees and levies on parents. Also, since no government funds were provided to the district and school levels for quality control, budgetary allocations, supervision and monitoring, this meant that the role of community participation initiated under the Nyerere administration in the 1960s and 1970s was rapidly altered to a role of exclusion from educational planning (Markov & Nellesmann, 2001).

Due to the stipulations made by the International Monetary Fund (IMF) in its Structural Adjustment Plan (SAP), Tanzania was forced to transition from a centrally-planned Socialist government to a multiparty democracy in order for loans to be dispersed to its bankrupt government. As a consequence, Tanzania enacted trade liberalization policies that resulted in budget cuts, reduced subsidies, and currency devaluations. Although within the SAP's first seven years this resulted in a decrease in inflation and an increase in foreign reserves, Tanzania ultimately became more dependent on foreign aid as a result of this stipulation (Tonini, 2010). Another effect of SAP was major cuts within the social sector, especially for health care and education. In the educational sector, school fees were reintroduced through cost recovery programs involving direct payment by students and their parents. This placed an extra burden on families, particularly in low-income urban and rural areas, which forced them to make hard decisions about how and if they were able to send their children to school. This was yet another factor which contributed to declining school enrollments in Tanzania during that time period.

The history of education in Tanzania created a situation where youth were given educational opportunities during ESR after independence but then 80% of both primary and secondary graduates were unable to attain employment in Tanzania's formal sector as a result of the low quality of educational services delivered and the limited employment opportunities due to the downturn of the Tanzanian economy (Stabler, 1979). After the economic problems beginning in the late 1970s, the limited resources invested in Tanzanian schools, the inadequate provision of training to teachers, the limited role of community participation in schooling, and the school fees levied on parents all

contributed to the low quality of educational services delivered and to the inability of school leavers to be prepared for positions of employment in the limited job market.

The State of Tanzanian Public Primary Schools in the 2000s

At the turn of the millennium, an estimated 2.5 million primary school children in Tanzania were out of school because the formal system was unable to provide services for them or because families were unable to or chose not to pay school fees for their children (Glassman, Naidoo, & Wood, 2007; Markov & Nellemann, 2001; Wedgwood, 2007). With only 2.6% of the country's \$6 billion annual budget allocated to education, formal schooling in Tanzania did not have the capacity nor the resources to implement traditional methods for constructing formal schools and for overseeing these schools, particularly for less accessible or marginalized areas.

In response to this situation, like many other SSA nations, Tanzania has adopted a national goal of increasing access to schools and enrollment rates in recent years under the Dakar Framework for Action of Education for All (Tanzania Ministry of Education & Culture, 2003). Up to this time, the government did not prioritize a major increase of public secondary schools in Tanzania. One reason given by Tanzania's ministry of education for this change in focusing on increasing primary and secondary enrollment rates was their acknowledgement that a failure to improve educational access and quality of primary schools in Tanzania would result in low participation rates in secondary schools. It was rationalized that this lack of participation could lead to low economic productivity and gaps in scientific and technological development due to having an unskilled, illiterate workforce (Tanzanian Ministry of Education and Culture, 2003). For example, graduates from primary education earn 75% more than with those with no

schooling, while the salaries of secondary graduates are 163% more than those without schooling (Wedgwood, 2007). Studies have also found that those who complete their education in Tanzania have significantly increased agricultural output. For example, completing primary school is correlated with a 27% rise in crop production in Tanzania which was attributed to farmers making “sensible changes” in crop production (Wedgwood, 2007). However, the studies above only took into account agricultural production but did not take into account differences in the salaries of students. These studies also did not include the rates of return to students which is the difference in the earnings in salaries with the opportunity costs of students studying in school such as the direct costs (e.g. school fees) and indirect costs (e.g. costs associated with maintenance of school uniforms, taxes, management of students by parents) (United Nations Educational, Scientific and Cultural Organization, 2002). Other benefits of primary education include lower child mortality such as the prevention of diseases and nutrition supplementation, decreased vulnerability to abuse, longer life expectancy, increased gender parity, higher labor force participation, higher earnings, and higher national gross domestic product (United Nations Children’s Fund, 2013). Because of these clear benefits, increasing Tanzanians' access to schools has remained a major priority for government financing, despite being faced with a myriad of educational challenges.

Since 2000, there have been two major initiatives addressing primary and secondary education in Tanzania. These efforts have focused on expanding the number of available teachers and increasing school resources, such as classrooms, desks, and textbooks available for students.

Primary Education Development Program. One of the two major education reforms recently implemented by Tanzania's Ministry of Education is the Primary Education Development Program (PEDP). In response to dropout rates of nearly 40% in some regions and access to education being limited in marginalized areas, Tanzania's Ministry of Education and Culture designed and implemented this program as a major reformation of their primary education system. Its main objectives were to expand school access, increase school retention, improve quality of education, provide capacity-building, and strengthen institutional arrangements. This comprehensive reform of the Tanzanian primary schools was launched in 2002 and designed to be implemented over the course of 10 years, with a World Bank loan of \$977 million USD.

PEDP has operated under the assumption that increasing school inputs with additional public funding will result in school improvement (Tanzanian Ministry of Education and Culture, 2003). Two of its main objectives are to increase school enrollment rates and to improve school accountability, and as a result, the program required school committees of community members to be formed in affected locales during the first phase. It was the responsibility of these school committees to approve school budget proposals, manage school bank accounts, oversee the fair distribution of the procured funds, and enforce school attendance.

In Tanzania, primary school enrollment nearly doubled from 2000 to 2004 (Tanzania Ministry of Education and Culture, 2003; Sitta, 2007; World Bank, 2005). Other accomplishments of PEDP have been: (a) school fees for public education were

abolished, (b) the Gross Enrollment Ratio (GER) increased from 84% to 112.7%,²⁵ (c) the passing rate for the Primary School Leaving Examinations (PSLE) increased from 28.6% to 61.8% (see Table 1), (d) the primary to secondary school transition rate increased from 20.3% in 2000 to 67.3% in 2007, (e) the Book Pupil Ratio increased from 1:20 to 1:3, (f) the number of primary schools increased from 11,873 in 2001 to 14,700 in 2006, and (g) capacity-training was provided for school committees and educational leaders at all levels (Tanzanian Ministry of Education and Culture, 2003; Sitta, 2007).

Table 1. Results of Primary School Leaving Examination, 2000–2004

| | 2000 | 2001 | 2002 | 2003 | 2004 |
|------------|---------|---------|---------|---------|------|
| Candidates | 389,746 | 444,903 | 492,472 | 492,472 | n/a |
| Passes | 85,576 | 110,633 | 133,674 | 196,273 | n/a |
| % Passes | 22 | 25 | 27 | 40 | 48 |

Source: World Bank, 2005.

Educational quality in Tanzania in the wake of PEDP. Research within Tanzania after PEDP was implemented has shown an imbalanced attention to quantity over quality (Anangisye, 2010; Davidson, 2005; Kuder, 2005; Sifuna, 2007; Wedgwood, 2007). Impediments to quality education presented in the literature address the role of the teacher, such as teacher accountability and commitment (Davidson 2005; Davidson 2007; Mkumbo, 2012; Towse, Kent, O-saki, & Kirua, 2002). Existing evidence indicates that a major obstacle to educational quality in Tanzanian primary schools is that teachers are not motivated or committed to doing a good job in the classroom. A proposed means to improve this lack of motivation is through establishing greater teacher accountability (Hardman, Ackers, Abrishamian, & O’Sullivan, 2011; Macpherson, 1999).

²⁵ The increased enrollment rates were also a likely consequence of double shifts in schools. In 2004, for example, 21 % of schools had an afternoon session in addition to the morning session (World Bank, 2005).

The literature also reports challenges in educational quality due to financial and resource constraints (Anangisy, 2010; Davidson, 2007; Sifuna, 2007), rote instructional methods that are teacher-centered while the students remain aloof (Davidson, 2007; Hardman et al., 2011; Osaki & Agu, 2002), chronic teacher absenteeism (Yu & Thomas, 2008), no clear systems for monitoring teaching quality by ward and district level offices (Macpherson, 1999), crash course programs that fail to prepare teachers adequately (programs were changed to one instead of two years when PEDP was implemented (Anangisy, 2010)), ward teacher certification requirements are acquired with ease in comparison with other professions (Mkumbo, 2012), and corruption by school teachers and leaders (Anangisy, 2010). The data show that problems in teaching and learning quality in Tanzania are greater in rural contexts than in urban areas (Woods, 2008). Parents with resources frequently supplement education with tutoring or transfer their students to private schools to ensure passing exams (Anangisy, 2010; Wedgwood, 2007).

In other studies on teacher perspectives in Tanzania, teachers state that they encounter many challenges in their classrooms because of the lack of sufficient resources and training. This includes large class sizes, lack of teacher training, low teacher salaries, poor teacher housing, student absenteeism, low teacher status, lack of teacher benefits (i.e. healthcare), and high workload (Barrett, 2007; Davidson, 2007; Mkumbo, 2012; Yu & Thomas, 2008).

Secondary Education Development Program. The general education trends in Tanzania in recent times indicate that, in 2003, Tanzania had a very low secondary school Graduate Enrollment Rate (GER), which was at 7.4% for lower secondary (Form I) but

which rose to 11.7% in 2005. One major reason for this increase is Tanzania's National Strategy for Growth and Reduction of Poverty (NSGRP), which was implemented in 2005 and which established a government target of at least 50% of boys and girls ages 14-17 enrolled in Form I and 25% in upper secondary (Form III) by 2010 (Vice President's Office, 2005). This goal implied that substantial resources needed to be provided to secondary schooling in order to accommodate the approximately two million more students who could be enrolling in secondary education by 2010, in addition to 500,000 additional students in 2005.

One reason for prioritizing the expansion of secondary education in Tanzania was because of evidence that production workers must possess skills at least at secondary levels in order to develop technological capacities (Levin, 1980). Another reason for this large-scale investment was recognition that the primary school teacher supply crucially depends on there being a sufficient supply of graduates from quality secondary schools (Psacharopoulos, 1994). Significantly increasing the number of state secondary schools also became prioritized in Tanzania because of the perceived shortcomings of the privatization of education in sub-Saharan Africa. Although private provision had been encouraged throughout sub-Saharan Africa in general from the 1980s to the early 2000s, enrollment rates in all SSA secondary schools only slightly rose from 20.1% in 1991 to 24.3% in 2000 (United Nations Educational, Scientific and Cultural Organization, 2002). In Tanzania there was limited government support for increasing the number of secondary schools through providing incentives for such schools.

In response to the NGRSP target of 50% of boys and girls enrolling in Form I secondary school by 2010, the post 2005 election government, *Chama cha Democrazia*

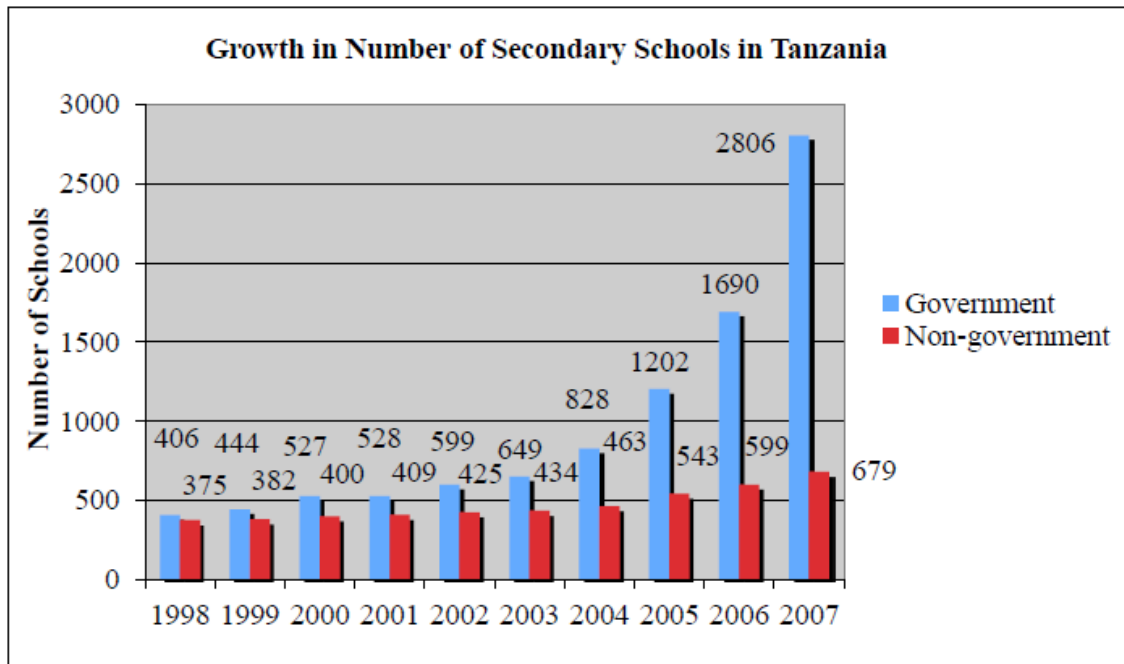
(CCM), or the Democratic Party, declared that a school would be built in every ward (a sub-region of Tanzanian districts). This was called the Secondary Education Development Program (SEDP), and it was launched as a timely sequel to PEDP in Tanzanian secondary schools from 2004-2009 with a \$123 million USD and a grant of \$26.4 million USD both from the World Bank. The main objective of SEDP was to expand secondary school access in order to increase the transition rate from primary to secondary school to 50% by 2010. The project targeted equity, retention, quality, and management issues. It also utilized a community-based development approach by requiring community participation in the construction and renovation of school buildings, the mobilization of resources, and on school committees (Tanzania Ministry of Education & Culture, 2003).

In order to accomplish this objective, the TMEVT declared that a new type of secondary school would be constructed, mandating that a community secondary school would be built in every ward. These schools were defined as community secondary schools because the communities within each ward were called upon to support the construction through cash contribution or by offering labor. The aim of creating these schools was to provide affordable options within walking distance so that primary school leavers who would have been otherwise unable to join government and private secondary schools could be absorbed. One significant outcome of this initiative was that enrollment of primary school leavers in Form I government secondary schools²⁶ drastically rose from 7.4% in 2003 to 14.8% in 2006 and to 22.1% in 2008. However, this was still far from the goal of 50%. Another effect was that the total number of secondary schools

²⁶ Government secondary schools in Figure 2 are represented by traditional government secondary schools as well as secondary government community schools.

tripled from 1,202 in 2005 to 2,806 in 2008 (see Figure 2). This expansion occurred through a substantial increase in government community secondary schools; by 2008, 77.6% of all secondary schools were government community secondary schools (see Table 2). Secondary education enrollment in Tanzania increased nearly five-fold from 2003 to 2010, from 319,487 to 1,556,685.

Figure 2. Growth in Number of Secondary Schools in Tanzania



Source: World Bank, 2008.

Table 2. Number of Secondary Schools According to their Category (2008)

| Category | Number | Percentage | Total student enrollment |
|------------------------|--------------|-------------|--------------------------|
| Traditional government | 91 | 2.4% | 20,976 |
| Government community | 2,948 | 77.6% | 678,209 |
| Private | 658 | 17.3% | 151,199 |
| Seminaries | 101 | 2.7% | 23,597 |
| Total | 3,798 | 100% | 873,981 |

Source: United Republic of Tanzania, 2008.

Educational quality in the wake of SEDP. Although the TMEVT reports that secondary enrollment has more than doubled as a result of SEDP, Tonini (2010) found that a number of issues of quality were impacted negatively by the SEDP reform. Tonini argues that this was because the focus was placed on increasing school expansion in lieu of quality improvement approaches, such as increasing teacher preparation and training or improving school libraries. She argues that these problems arose because ward community secondary schools were created without assurance that these facilities would have resources comparable to older state secondary schools. Tonini attributes this to be because of the reliance on quantitative outcomes such as “numeric targets as measurables of accountability and policy success” (p. 204). For example, she shows how the pupil teacher ratio has been rising over time. She also finds that the percentage of teachers with college degrees and diplomas is decreasing while those with low-level certificates has increased. By focusing on raising student enrollment numbers through increasing the number of available schools and increasing the supply of teachers, she argues that these developments have the potential to negatively affect educational quality and therefore the effectiveness of the new schools because less attention is placed on what is going on in those schools and what students are achieving.

For example, a main component to be addressed by the SEDP reform was textbook allocation. Tonini found a huge variation in the number of textbooks to students across Tanzania, with ratios ranging from one book for every five students to no books available. Furthermore, she cites the strong focus of SEDP on enrollment targets as being

problematic for creating more equitable access due to the high cost of secondary school.²⁷

Importance of primary national exams related to social mobility for Tanzanian school leavers of primary and secondary school. Tanzania is divided into primary and secondary systems, which together last for 13 years. In primary school students must pass exams in standard²⁸ IV in order to enter standard V. If they do not pass they must repeat standard IV. In standard VII students must again pass exams to be given entrance into secondary school. Many children leave school at this point and go to work.

There are also two national examinations at the secondary level; in Form (year) IV of secondary school they must pass an O-level exam to be given a Certificate of Secondary Education. Those with higher marks who want to go on to university must then take two more years of schooling known as Form V and VI of A-levels (advanced) and take the second exam to attain their Advanced Certificate of Secondary Education.

Saunders and Vulliamy (1983) emphasize that academic schooling and the concentration of exam preparation remains the priority in Tanzania and other developing countries. They found that pedagogical practices where students are more actively

²⁷ While Tonini (2010) cites secondary school fees as only being 20,000 shillings (\$12 USD approx.) for Tanzanian families, in my own inquiries I have found that the total annual secondary school fee cost was even higher, ranging from 120,000 (\$74 USD approx.) to 220,000 shillings (\$135 USD) per year per student. This was because of direct fees (exams, school fees), indirect fees (uniform, transit, and contributions in kind, such as corn and beans for school lunch, building supplies, labor, and manure for school cultivation plots). Tonini also cites other obstacles to families being able to afford the secondary education of their children, such as the opportunity costs of children not working, a limited supply of secondary schools, and the distance to schools (p. 16).

²⁸ Primary grades are called standards and secondary grades are called forms.

engaged and which incorporate a community-oriented education oriented to practical work relevant to rural lives - an approach that can be applied in all school subjects including math and science - may be seen by parents, teachers, and students as inferior to academic schooling and therefore be met with opposition. The findings of Vavrus (2009) added to this by showing that attempts to train teachers in Tanzania to use pedagogical practices where students are more actively engaged through participation were opposed by teachers and students because of the lack of correspondence between what was being learned and what is on the examination. Although Vavrus intended to introduce participatory methods where students were actively involved in their learning through small group activities and classroom discussions in a state secondary school in northern Tanzania, she found that students were less interested in complying because they viewed these skills as not being relevant in terms of preparing for national exams. Thus, despite her efforts, she found that learning in the educational system remained to be based largely on rote memorization for national exams.

Social mobility has been a major motivation for parental support of their children's enrollment in schooling in Tanzania. However, due to the quality at ward secondary schools being generally very poor, in their interviews conducted in Moshi rural district, Kilimanjaro region in Tanzania, Vavrus and Ojwang (2013) found through analyzing exam pass rates that social mobility from one generation to the next is limited. They attributed this to be due to ward secondary students not being able to pass Form II or Form IV secondary school exams—unlike primary school leaving exams which are in Swahili, these exams are given in English—in order to advance to A-levels, which are the final two years of secondary school necessary in order to gain access to universities

(Vavrus & Ojwang, 2013). One reason for their inability to do so was because of insufficient teachers and educational resources. In a survey conducted in seven ward secondary schools in Muheza district, Tanga region, Masha (2012) found that all the schools visited did not have chemistry, physics, biology or English teachers and that students shared textbooks at the ratio of 1:7.

Although data on primary school dropout rates in Tanzania are problematic because of many of the school dropouts may not be included due to their remote locations or because they have not entered formal education, in 2005, estimates ranged between 30 and 55% (World Bank, 2005). Though many students do fail the Primary School Leaving Exam, in her study in Mtwara province in southern Tanzania, Halley (2012) concluded that it was not the test that was the barrier (it requires only basic abilities in reading, writing, and mathematics to pass) but instead the barrier was the poor educational services provided in overcrowded and under-resourced public primary schools. For those students who did pass the PSLE in Standard VII, which is required in order to be enrolled in secondary school, Halley (2012) found that for a number of participants who did not complete secondary school or pass the PSLE, economic constraints were a reason for not continuing to secondary school, due to avoidance of the burden of paying school fees. Halley (2012) found that Tanzanian students in Mtwara province often chose to become “ineligible” for secondary school by dropping out of school prior to completion of the final year VII of primary school. While Tanzanian law stipulates that parents must educate their children through secondary school if they pass the PSLE, the secondary school fees that are required to be paid makes adherence to this

law too challenging for the economic constraints faced by many families (Children's Dignity Forum, 2009).

How This Dissertation Adds to Our Understanding of These Issues

To show how this dissertation adds to understanding of these issues, it will be fruitful to look at two influential works on Tanzanian education by American researchers and see what their distinctive contribution is and what more might be needed.

How This Dissertation Complements Vavrus

In *Desire and Decline*, Frances Vavrus reports on research in the Kilimanjaro region in Tanzania and discusses schooling in Africa and worldwide. She states that, in these contexts, education is perceived to be a panacea by the international aid community for resolving social problems. The main focus of her text is to explain “why faith in schooling endures, particularly in those parts of the world where social and political-economical problems seem most intractable” (p. 3). Although this is the main objective stated at the beginning of her text, she focuses not on the practices of teaching and learning, but rather on topical issues of particular concern such as HIV/AIDS, gender, the role of non-governmental organizations, and environmental issues such as deforestation and water rights.

My dissertation is related to but different from Vavrus' effort to highlight the conditions that give rise to the desire for schooling and major constraints of schooling (p. 4). Vavrus is not so much concerned with the various voices of the particular actors involved, whereas this dissertation includes the diverse voices and perspectives on schooling in each community. Vavrus did collect rich data using a variety of different methods, including observations, interviews, longitudinal surveys, and focus group

discussions, but she performed these collections without a major focus on how villagers or teachers experience schooling practices in the site for her research (Moshi town, Kilimanjaro region). In contrast, my own dissertation research focuses on stakeholders' experiences and viewpoints as well as practices in order to illustrate some of the realities and major constraints for teaching and learning in Tanzanian state primary schools.

I interviewed a diverse range of households (e.g. single mother, high socioeconomic status (SES), low SES, educated, different tribe, elderly) in order to try to capture diverse views on the delivery of educational services to their children. For example, I came to understand better how much families struggled and suffered to pay the required annual primary school fees for a security guard, exams, a school cook, and items for school lunch such as corn, beans, salt, oil, and firewood. Below, this quote from a mother of an impoverished household at Nyota Primary School in Mchanga Village in Arusha Region, Veronica W. Urrio, is an example that elucidates this struggle at one of the sites of my research:

Last year I was able to pay school fees [for my two children in secondary school and one in primary school] by selling the only cow we have. Every day I think about how I will feed my children when they come home. How can I pay for school fees? Next year I will have to pay 350,000 shillings (\$200 USD approximately) for my two children who will be in secondary school.

This interview response indicates that this mother's children will likely be unable to advance past their Form I (Year One) or Form II (Year Two) of secondary school due to the financial constraints the family suffers in doing so.

My research for this dissertation also includes the views of parents in terms of how much schooling they desire for their children, what sort of positions of employment they believe can be procured if their children achieve these proposed levels of schooling, and where they expect their children to live if this is accomplished.

How This Dissertation Complements Stambach

In her book *Lessons from Kilimanjaro: Schooling, Community and Gender in East Africa*, Amy Stambach reports on her time in Machame village, Kilimanjaro region teaching and observing secondary English classes, conducting interviews and household surveys, and visiting other secondary schools. Since her aim was to look at “the ways in which what goes on inside schools is related to what goes on in the greater outside” (p. 12), limited sections of her study are focused on the in-school culture and the realities of teaching and learning there. Primarily, however, Stambach focuses on how changes in the behaviors and lifestyles of particular individuals in Machame village, Kilimanjaro region, Tanzania are shaped by the formal education they receive. Particularly, she investigates how these changes are incorporated in the lives of students and how this relates to traditional values and positions as perceived by adults in the sites of her research (Foster, 2001).

Another theme spotlighted in Stambach’s study is gender and generational differences in the society of the dominant ethnic group in Kilimanjaro region, the Chagga. She examines how education has provided the means by which contemporary Chagga women are able to choose their occupation and lifestyle in contrast to patterns of traditional marriage. One chapter of her text is devoted to case studies of three female students who are secondary school-leavers. In this section she explores the views of

villagers regarding the value of schooling—while some felt that this was undermining traditional norms such as girls no longer adhering to domestic duties, others saw schooling as social progress.

Whereas Stambach focuses on the positionality that students attain through schooling in terms of age and gender, my own research is focused on understanding the nature of teaching and learning at the two school sites and the views and understandings of village stakeholders about these realities. I spent six weeks at each site observing classroom and teacher activities and working alongside students on school farm activities; the classroom observations Stambach conducted were limited to five days, during which she visited seven secondary schools, met with teachers and administrators there, and sat in a dozen classes where she paid attention to “general organization and physical conditions” (p. 111). She specifically notes that her major aim was not to focus on the skills of the teachers or students’ comprehension (p. 113).

Although teaching and learning at the classroom level was not the focus of her research, she does briefly mention the instructional methods used by teachers at the school sites of her research: she observes a call/response interaction of teacher and students that was typically used in class and describes how a process of listing and copying notes was adhered to by teachers. My dissertation research extends Stambach’s findings by focusing on gaining a better understanding of why teachers in Tanzanian state schools use such methods in class.

Another way in which this dissertation complements Stambach’s findings is by examining why teachers often resort to cultivating fearfulness amongst their students. In

her research, Stambach is surprised by the trepidation among students generated just by the teacher's presence:

The teacher stepped off his platform at the front of the room and walked up and down the aisles. To my surprise, many students physically cowered and looked down, apparently afraid...I did not see this particular teacher tweak students' ears or pull on their shirts and hair, as I saw some teachers do at other schools (p. 116). In my case, I found use of and fear of corporal punishment to be systematic in one of the two schools I studied. This led me to investigate why this was the case.

One way in which my dissertation research is consistent with Stambach's findings is that we both emphasize that teachers vary in important ways. Stambach found that some teachers cane and provoke students, while others do not. One of the teachers in her study even brought schoolgirls to his home in order to make them cook his dinner, and leaked exams to these students ahead of time in exchange for doing so (p. 145). In my dissertation research, it was found that some teachers were particularly caring for their students while others were reported by students as excessively caning their students.

In her study, Stambach found that teachers attributed authoritarian behavior of other teachers to a weak institutional structure with undefined rules and also external pressures such as Western ideas (p. 146). This dissertation takes a somewhat different approach by asking teachers about the decisions they make at school and how this relates to some of the realities they face in their everyday lives. The views of parents regarding such instructional methods are also solicited.

As in my dissertation, Stambach interviewed students. However, her interviews focused on how participation in popular culture was used by students as an alternative to

the tradition of elders in Machame, Kilimanjaro. She discussed this comparison through choices students made about the music they listened and danced to, the clothes they wore – such as fashionable commodities – and how they used this behavior to reposition themselves in Machame society as an attempt to shift the traditional power structure. Unlike Stambach’s focus on the students’ involvement with society at large, my dissertation is more concerned with how students personally experience school and what this experience means to them and their families. As the following chapters demonstrate, these experiences are complex and variable, challenging simplistic over-generalizations about the nature of schooling in Tanzania.

Conclusion

This chapter highlights the major reforms that have recently been implemented to increase educational access in Tanzania and the historical foundations of its educational system and the role of agriculture in it. The modern reform efforts in Tanzania, PEDP and SEDP, differ from the model of educational reform used by Tanzania’s first president, Julius K. Nyerere, because of their focus on increasing enrollment while comparatively less attention has been focused on the development of rural areas through the mobilization of communities and the active participation of students and villagers in generating revenues for their community’s school through generating agricultural output . Since the research illustrates that there has been a major deterioration in educational quality as a result of the PEDP and SEDP reforms, this dissertation focuses on realities of schooling practices on the ground in two Tanzanian primary school sites, one in Fadhili hamlet, Arusha region, and one in Mwika village, Kilimanjaro region. This dissertation addresses these gaps in the literature by incorporating the perspectives and experiences of

a diverse range of stakeholders in each community and investigating the delivery of education services at the classroom level within Tanzanian state primary schools.

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CHAPTER 3

Investigating the School, Student and Their Family: Methods and Researcher Positionality

This chapter discusses the research questions, methods, and researcher positionality for this study. I begin with the collection of data in these two sites and my methods of coding and analyzing different sets of data. The second section provides an overview of the relationships and persona I developed within each site and how these developments relate to the particular data I was interested in gathering. The chapter ends with limitations, complexities, and issues resulting from the methodological choices that I made and my identity as a researcher.

While the research methodology I used centered on interviews, the approach was ethnographic in the sense that it attempted to capture the perceptions, daily activities, conversations, and stories of the teachers, students, and adult villagers in each site. This is an approach that is comparatively similar to that employed by Marshall & Rossman (2006). In order to understand the deep meaning of experiences expressed in the participants' own words, I lived and worked full-time in the communities that I was researching as much as possible. The majority of my time was spent in the school sites, where I observed classroom practice, participated in the school farm activities alongside students and teachers, and interviewed teachers, administrators, and students. Some of my time was spent outside the school in their respective communities, through attending community events and meetings and engaging in informal conversations with villagers.

Research Questions, Methods, and Researcher Positionality

This study contributes to an emerging body of literature investigating how school cultivation policy and practice shape student learning, with an understanding of student learning as a product of the dynamic and complex relationships of schools, communities, and governmental and non-governmental agencies. Thus, the approach I have taken in this dissertation is complementary to the literature on school cultivation, but it is also different because, unlike the existing literature on school cultivation, I use a more holistic approach. I accomplish this holism by putting school cultivation into the context of schooling practices in the two communities more generally and also by analyzing how the presence of school cultivation shapes the community's context itself as a result of the program, particularly in its development through agriculture, health and knowledge generation. I also endeavor to do this, in large part, by documenting and analyzing the individual perspectives of students, teachers, parents, donors, and government leaders.

Various qualitative methods were used to investigate the questions below. Analyses of policy and school level documents provided background information on schools. In addition to classroom observation, semi-structured interviews were conducted to collect in-depth information about the experiences of students, teachers, community stakeholders, government officials, and donor representatives with cultivation programs. Semi-structured interviews took an estimated total of one hour per subject. I collected data on approximately one to two subjects per day, and the researcher acquired parent or guardian permission for all student participants in the study. Additionally, I participated in the school cultivation and schooling activities in the two communities so as to analyze some of the commonalities between school cultivation practices and to

become aware of what goes on within the classrooms.

Research permissions

Prior to conducting this research, I attained approval from Michigan State University's Institutional Review Board (IRB) and the Tanzanian Commission of Science and Technology (COSTECH). The head teachers at both schools wrote letters of permission for me that welcomed me to conduct research at their schools. After presenting these materials to the district officers of education in Imara and Moshi Ndogo districts, I secured letters of permission from them that I presented to the head teachers at the two school sites selected as the focus of the my study.

Research Design

Table 3 outlines the research questions that I started with and the data collection methods used to address each question.

Table 3. Research Questions and Data Collection Methods

| Research Question | Data Collection Methods |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| 1) How do teachers, school leaders, and donors understand the value, purpose, and implementation of teaching and learning in school cultivation programs and regular classroom activities, and what kind of knowledge and support do teachers have for these initiatives? | Document analysis, classroom observations, semi-structured interviews |
| 2) What are the values and beliefs of students, their families, and their communities regarding the educational services provided based on the outcomes and experiences they have or do not have? | Participation in school farm activities, classroom observations, semi-structured interviews |
| 3) What other social, cultural and economic resources do families access and activate in pursuit of agendas for schooling at the family and community level and through participation in schooling? | Participation in community activities, semi-structured interviews |
| 4) What purposes are school gardens actually used for? | Participation in school farm activities, classroom observations |

Document analysis. The dissertation selected and analyzed the following documents for background information on the population and pertinent samples:

- Policy documents, including operational guidelines, budgets, and other studies commissioned by the Ministry of Education or the donors on the schools studied, the region of the study, or Tanzanian school cultivation programs generally. These documents were accessed at the Oikos office in Arusha town, through

meeting with the 4-H district coordinator in Moshi,²⁹ and at the Imara and Moshi Ndogo district offices and the ward offices in Mchanga and Nyota villages;

- School cultivation program background documents (mission statements, annual reports, strategic plans, etc.);
- School level records: background information on school cultivation programs in the community, curricula that teachers follow in school cultivation.

Pilot interviews of community members with school garden experience.

From June to August 2011, with the support of the staff at MS Training Centre for Development Cooperation in Ekundu River, Arusha region, I interviewed 13 villagers in Ekundu River who had experience as students, teachers, or parents in school cultivation programs. A major objective for these interviews was to learn about different views of school cultivation programs in addition to the historical context of school cultivation in Tanzania. These interviews also helped prepare me to use Swahili in an interview context and to assess and redevelop language-appropriate and relevant questions for semi-structured interviews. The goal of this pilot was to refine interview questions to receive meaningful, in-depth responses. These interviews lasted approximately one hour each and were conducted in Swahili. An in-depth summary of these findings is included in the following chapter 4, “Counterproductive Teacher Practices at FPS and NPS”.

Site selection. Also with the support of staff at MS Training Centre for Development Cooperation, from June to August 2011, I visited 16 public primary schools in Arusha and Kilimanjaro regions that had school cultivation programs, nine of which were donor-supported, and seven others that were independently run by the students and

²⁹ An interview in person or via the phone was arranged with the CEO of 4-H in Tanzania, but then was cancelled. It could not be rescheduled.

teachers. In each of these sites, I spoke with school leaders and teacher agriculture coordinators to learn about the nature of their farm/garden program, investigating topics such as the role of students and teachers in the program as well as its purpose, accomplishments, and challenges. Each school's programs were classified according to the responses I received, and two of the more successful school sites were selected from these 16 primary schools. The reason I selected two of the more successful sites was to examine the potential of such programs for contributing to student learning and community development. The two sites were Fadhili Primary School in Mchanga village, Arusha region and Nyota Primary School in Nyota village, Kilimanjaro region.³⁰ For a detailed description of what was learned during these site visits, please refer to the following chapter.

Semi-structured interviews. With the written or oral consent of participants, the study utilized a voice recorder for semi-structured interviews. Interviews took place in schools, churches, homes, and any other participant-preferred locations. A daily log of analysis ideas, learning experiences, and additional notes was maintained throughout the data collection period. All interviews were conducted in Swahili, unless otherwise preferred by participants.

Semi-structured interviews in schools. This study employed open-ended, semi-structured interviews to obtain information on teachers' perspectives about the school cultivation program in their community. Interviews were conducted in Swahili and took approximately one hour. Each interview was voice recorded with the written consent of participants. One to two interviews were conducted per day.

³⁰ All names of schools, villages, wards, districts, and interviewees are pseudonyms, but the names of regions have been retained.

During interviews with teachers, I focused on understanding how teachers made decisions about teaching national curriculum subject matter and materials through school cultivation. I also sought information about how teachers' relationships with villagers, other teachers in their school, and donors shaped the flow of resources to their schools, how this influenced their perceptions of what students needed, and how they responded to those needs in their curricular choices.

Semi-structured interviews with communities. The second set of data focused on parents and community members. These interviews focused on understanding parents' and students' perceptions of their school's cultivation program, its role in student learning, and their understanding of issues relevant to the program. From the classrooms I observed, I selected eight older students aged 11-14 in each community to conduct home visits and interviews with the students and their parents. The reason I selected older students was because they tended to be more articulate and less inhibited in their interactions with me whereas the younger students generally remained aloof. The intent in selecting eight students from the classrooms I observed was to include a wide range of families from the community. Based on the work of Aliah Carolan-Silva (2009), who conducted case studies of families in a rural Paraguay village, I sought for representation of the variation across students and their families by selecting students in order to include, as much as possible, a variety and range of gender, school achievement levels, socio-economic status, and locations of homes. I also attended school-related events within the community whenever possible in order to passively observe the types of interactions that occurred and to investigate whether and how school cultivation's educational value was publicly discussed.

Types of interviews conducted. The following is a table that summarizes the type of data collected from each interviewee, with a total of 98 respondents. All interviews were conducted in Swahili, aside from two non-governmental organization (NGO) Oikos staff members, who were Italian and preferred to use English in interviews rather than Swahili. Each interview ranged in length from 20 to 45 minutes for students, 30-70 minutes for parents, and 45 to 80 minutes with teachers. Follow-up interviews were conducted with participants who were found to be more responsive in interviews. As stated above, the interviews in Ekundu River, Arusha region were conducted from June to August 2011, the interviews in Mchanga village, Arusha region were conducted from October to December 2011 and again for three weeks in April 2012, and in Nyota village, Kilimanjaro region from March to mid-April 2012. Please note that informal interviews were conducted with ward education officers in each site as well as the district agriculture coordinator for the non-governmental organization 4-H in Moshi Ndogo district in Kilimanjaro region. Finally, eight informal interviews were conducted with staff from the Italian-based NGO, Oikos, in Mchanga village, Arusha region.

Table 4. Types of Interviews Conducted

| Type of person | Location | Number of people | Type of interview | Number of people in follow-up interviews |
|--------------------------------------------------------------------|-------------------------------------|------------------|-------------------------------------------|------------------------------------------|
| Villager with experience in Tanzanian public school garden program | Ekundu River village, Arusha region | 13 | one-on-one | none |
| Students | Fadhili hamlet, Arusha region | 16 | Focus groups with 2 to 3 students in each | 6 |
| Teachers | Fadhili hamlet, Arusha region | 7 | one-on-one | 3 |
| Villagers | Fadhili hamlet, Arusha region | 19 | 13 one-on-one, 3 focus groups | 3 |
| Ward education officer | Fadhili hamlet, Arusha region | 1 | one-on-one | 1 |
| Staff from NGO, Oikos | Fadhili hamlet, Arusha region | 8 | one-on-one | none |
| Students | Nyota village, Kilimanjaro region | 14 | Focus group with 2 to 3 students in each | 5 |
| Student graduated from second year of secondary school | Nyota village, Kilimanjaro region | 1 | one-on-one | none |
| Teachers | Nyota village, Kilimanjaro region | 6 | one-on-one | 3 |
| Villagers | Nyota village, Kilimanjaro region | 12 | 6 one-on-one, 3 focus groups with spouses | 3 |
| Ward education officer | Nyota village, Kilimanjaro region | 1 | one-on-one | 1 |
| Staff from NGO, 4-H | Nyota village, Kilimanjaro region | 1 | one-on-one | 1 |
| Total | n/a | 98 | 56 one-on-one, 42 in focus groups | 23 |

Classroom observations. In order to understand what happens within the classroom and whether connections were made to garden activities during classroom instruction, I observed science and other regular classes (math, history, Swahili, English, civics, studies of work, physical education) whenever possible to record the subject matter taught and the types of learning activities students engaged in. While at the schools I also conducted informal interviews with teachers in the teachers' office, attended teacher meetings, and gave students informal oral assessments gauging their understanding of agro-ecology. The focus of these investigations was to understand how teachers enacted the process of teaching about school cultivation and used school cultivation to teach about other subjects.

Organization and analysis of data. During my time conducting research, I recorded themes and field notes in a separate notebook. From these notes I developed weekly reports of my findings from interviews and five memos over the course of the fieldwork year that outlined the work I accomplished, themes that were emerging, and plans for what I would accomplish in the data collection for the next month. Through sharing these memos with my dissertation committee members, I was able to receive help when making important decisions about what additional data needed to be collected and how to allocate the remainder of my time. The memos also helped me to focus my data collection on emerging themes of interest.

Toward the end of my fieldwork, I conducted follow-up interviews with the teachers, students, and parents with whom I had had some of the most fruitful initial conversations around some of the central issues I was grappling with, such as the underlying reasons for the lack of meaningful instruction, teacher absenteeism from

classes, discrepancies between what programs like 4-H claim they are doing and what is happening on the ground, views about the value of national exams, the purpose of learning in school gardens and in the classroom, and parent support for the entire operation. These conversations both helped me further understand the positions of teachers, students, and parents around these issues and to understand why there were such differing perceptions across various groups of stakeholders within and between communities. Since I had already met with these respondents earlier, I found the interviewees were more comfortable with me, and it was less difficult to probe more deeply about their views and understandings of the particular issues and themes which I sought to learn more about.

While still conducting my fieldwork, the data analysis process began with the transcription of interviews. Qualitative interview data was transcribed by 14 hired research assistants. All quotations used in this dissertation were translated to English from Swahili by the author with the exception of the quotations of the Oikos school garden coordinator and their Food Facility Project Manager. However, throughout this dissertation, I will maintain the use of Swahili terms when I believe that there is not an adequate translation into English. Summaries of each interview were also recorded by the researcher as field notes. Data source triangulation was applied to interview data to increase reliability.

I divided the data into three sets for the purpose of analysis. The school-level data includes observation notes from the NPS and FPS farm activities, classrooms, schools meetings and events and interviews with teachers, administrators, and students at the schools. The family data includes formal interviews with the 25 parents and field notes

from these and other visits as well as conversations with these families. The third set of data includes interviews and field notes from conversations and visits with representatives of the donor institutions. I chose to analyze the data with an “open coding” process (Strauss & Corbin, 1990). I did this by organizing the data from my field notes and transcribed interviews manually by reading through and highlighting relevant data first according to each group (students, parents, teachers) and then coded this data into tentative conceptual categories based on the different interview questions I had asked. Triangulation was used to increase reliability where possible.

My Role as Researcher

The purpose of my interpretive approach was to gain an understanding of the function of schooling in the lives of families, communities, and their children through their experiences, interactions, as well as their perceptions of their experiences. The participants in this study were encouraged to utilize their own voices to tell their stories in their own manner. Like Ladson-Billings (2000) contends, I sought data through persons telling stories in their own language and according to their own perspective because their forms of expression reveal many intricate textual layers of how topics and truths are viewed according to them.

According to Emerson, Fretz, and Shaw’s (1995) position on ethnography, participants’ meanings cannot fully be understood solely through the interviews or informal questioning due to time constraints, distrust of the researcher, discomfort, perceived threats to anonymity, and breaches of cultural norms of communication. Although I conducted semi-structured interviews in this qualitative research study, I also made efforts to conduct research as an ethnographer who strategically placed himself in

the daily life of the participants in order to be near – and even directly involved with – the participants and their experiences. I accomplished this objective by performing agricultural tasks alongside students and teachers, spending time with students and teachers in the classroom observing classes and providing support when requested, and eating lunch informally with each of these groups of participants. This allowed me to interview students and teachers in more informal settings where I was able to gain their confidence. In this way, deeper meaning could be derived through experiencing and observing how participants interacted and the behaviors they enacted with one another. I opted to immerse myself in the site and volunteer in the school farm/garden, office, and classroom activities at the schools as much as possible in order to have the time and space to be involved in the daily lives of the participants in this study. I did this with the intention of generating a deeper understanding about how the donor-supported programs impacted the beliefs and values of community participants about the role of schooling in their lives and how this compared to conventional public schools in Tanzania.

My role at Fadhili Primary School (FPS)

My Research Relationships and the Research Persona I Cultivated

The relationships I fostered were a central component of this study. This is because this study involved research with people and not just on them, and therefore its success rested on the importance of constructing interpersonal relationships (Arieli, Friedman, & Agbaria, 2009). At FPS I tried to accomplish this task by allowing myself to be accessible to the teachers, students, and community. I did this by arriving at 7:00 am each day when students arrived to school and remaining in the community until a few hours after the school day ended.

My research relationship with Fadhili Primary School students. I tried to establish trust with the year VI FPS students by spending time with them so that they would feel more comfortable around me. I did this by working alongside them in the garden, having informal conversations with the entire year VI class in the classroom when lessons were not being taught, observing lessons taught by other teachers in their classroom, and helping these teachers to teach when they asked me for my support. During my informal conversations with the year VI classroom, I had the students individually ask me different questions about who I was, where I came from, what I do for my work, and why I was here. We also discussed what I was trying to learn through my involvement in their community and that I would need their help in this experiment because they knew more about agriculture in this area than I did and therefore they were my teachers too.

After my interviews with particular students, I had them briefly explain to the class what we talked about, how they felt during the interview, and what advice they had for the other students who would have conversations with me. My motivation for doing this was to assuage any fears that students might have about talking with me through learning about the experience of one of their classmates in their interviews with me. Afterwards I found that they generally informed the other students that I wanted to interview that they should not be afraid because I was only going to ask them a few questions about school and what they did in the garden. However, it is important to note that since I was observing the students talking to the other students that they might not have felt comfortable sharing their actual feelings about the experience. Still, in my one-

on-one conversations later with these students they individually told me that they enjoyed the interview process and many even asked if they could be interviewed again.

As will be discussed in the findings in chapter 7, “Diversity of perceptions, values and opinions,” I found that building relationships with most students at FPS was challenging. In interviews, parents attributed this difficulty being due to the formal relationships between teachers and children in Tanzanian society where children are expected to remain silent or face punishment by teachers. As an FPS mother from a single-parent household said, “Students are quiet in class because they are afraid of the teachers. They will get hit if they make a mistake. That is Tanzanian culture. Students are afraid.”

Another reason for this barrier with the students was a result of my outsider status. According to Gipsam Mlay, the FPS head teacher—he is also an outsider in Mchanga village because he is from Iringa region in central Tanzania—responding to inquiries from outsiders is not encouraged in Meru culture:

I have asked parents here why children here do not speak in class. I found that their parents also remain silent if you ask them a question. It is also difficult to tell them something. Even if you tell them that there is an event on a certain day, they may not arrive, and if you ask them why they did not show up, they will respond, “I do not know!” In class if you ask the children a question they will also respond “I do not know!” And then if you ask them, “Which part do you not understand?” they will say again, “I do not know!” I have noticed that it is part of the Meru culture here not to explain themselves or their answers to outsiders.

This response illustrates that children are expected to remain quiet and non-participative in the Meru culture of Mchanga village and that, in some cases, this culture of silence even transfers over to later years when adults remain aloof and disengaged from schooling activities. Despite these constraints due to the limited interactions reported between FPS teachers and students, I found that I was able to develop personal relationships with a few students in year VI who were not afraid to give articulate answers. I found that focus groups were more effective for interviewing because students were less shy when working in groups, especially for the year VI girls.

One way I attempted to break the ice was by telling the students that I would be asking them a few questions but that after I was finished they could ask me any questions that they had. I did this in order for the students to have access to me as a resource for any items of inquiry they had about me and where I came from but to also break down the barriers between me as researcher and them as subjects. What I found, though, was that, overall, the students remained very shy even with regard to asking me questions.

My research relationship with FPS parents. Although I had only five weeks in the FPS site during my first visit before school closed, I tried to make the community feel more comfortable around me by being as accessible as possible. I did this by walking and bicycling to and from work with students from FPS and always stopping for conversation or simply by accompanying villagers, students, and teachers during their daily tasks. I also attended community events such as the local market days on every Friday and funerals, where I met villagers and also made myself known to the community.

Nevertheless, it was difficult to develop strong relationships with adults in FPS, in part because I was not able to find a place to stay within the Fadhili hamlet and thus had to transport myself daily from the Maasai community of Ngamia 15 kilometers away. This meant I could not spend time in the community after school because I needed to arrive back to Ngamia before dark. Since it was a cultural norm to spend time in the afternoon talking with their neighbors, this meant that I could not participate in informal conversations they were having. However, whenever I did have opportunities to interact with them the villagers were very welcoming of me. One reason for their openness in their interactions with me was because of their familiarity with Europeans: Oikos staff, who were mostly from Europe, had been working in their community and interacting with their community leaders for the past seven years.

In spite of these obstacles, with help from the former head teacher, Dawson, I was able to interview 17 community members at FPS. The former head teacher arranged interviews with individuals in the community according to the criteria I had set for selection of the interviewees (poor, educated, single mother household, lives far away, different ethnic group, senior citizen). I found that in many of my interviews the parents were already aware of who I was and what I was doing in the community.

In a similar fashion to the students, I told the community members that I would be asking them questions and that, after I was finished, they could then ask me questions too, in order to offer myself as a resource to the villagers. What I found was that this frequently resulted in rich conversations that were very often relevant to my own research agenda. Frequently they asked me about agricultural techniques they could use to improve their farming. I had to explain to them that I was not an expert in agriculture but

tried to offer them whatever inputs I could contribute. Typically I did this by sharing with them the phone numbers of the particular Oikos staff with agricultural expertise in this area with whom I was acquainted.

My research relationship with FPS teachers. Since the FPS teachers, instead of being in the classroom, were most often in the teachers' office throughout the day, I spent a lot of time with the teachers during the school day there. One of the teachers had just recently left FPS in September and I was given this person's desk to do my own work. I used this time to write up field notes, survey the teacher resources (such as the curricula for years I to VII and student learning materials), and find the parts of the curriculum that had a relationship with agriculture. I also shared my box lunch with the FPS teachers and they, in turn, insisted on sharing their cooked school lunch with me too. Often we would share stories during the lunchtime about issues they had with parents and students in the community (such as particular parents not contributing beans and corn for the school lunch) and shared stories they had about the history of their community, district, region, and nation. On the second to last day, I also purchased the entire school lunch for the teachers so as to thank them for their kindness in supporting my research in their community and school. Since the teachers must each contribute shillings in order to have their school lunch cooked for them, they were appreciative of this gesture.

As trust between us grew over time, I often asked individual teachers questions I had about the work that they were doing for their classrooms, their schedules, their activities, the nature of their exam preparation, their particular grading procedures, and their training in and knowledge of science toolkits provided by the Tanzania Ministry of

Education and Vocational Training (TMEVT) while we were in the teachers' office together.

As time proceeded, I was able to interview seven out of the eight total FPS teachers. These interviews were very fruitful, and I was able to acquire a lot of candid information about the challenges they faced as teachers in their school and community. This was especially true in my later interviews with three of the teachers with whom I had developed stronger relationships because I had spent a lot of time with these particular teachers each weekday and had formed stronger bonds with them. Since interviews were conducted in Swahili, I found that they were more comfortable in speaking with me because they were accustomed to speaking in Swahili. Another factor was that they had grown accustomed to working and speaking with Western foreigners since Oikos staff who primarily came from Italy had been working in Mchanga village for the past seven years.

When I gave the teachers the opportunity to ask me questions at the end of the interviews I found that they enthusiastically did so. Through their questions, I learned a lot more about issues they faced in their community and school as well as the interests they had in relation to who I was and where I came from. A few of the teachers asked me for suggestions I had about how to teach agriculture and classroom subjects in their schools. We shared ideas we had about science projects, demonstration plots, comparisons between different seeds, and the relationship between agriculture and curricula. Since I have ten years of experience as a primary school teacher, they were often very interested in strategies I could share that they could use to improve their teaching.

Another way I developed my relationship with FPS teachers was that I often observed teacher lessons. One of the classrooms in which I particularly allocated my time was the year VI classroom. This was because the year VI students were the FPS students selected to carry out work daily in the school garden. I was told that the reason the year VI students did school garden work was because year VII students were preparing for the national exam and year V students were too small to be able to work effectively in the garden.

My role at Nyota Primary School (NPS)

How I Allocated My Time Working with Students on Various Farm Activities at NPS

At NPS I was faced with the challenge of covering all the different farm activities in which students from year III to VII were engaged (see NPS Schedule of Daily Farm Work for Students below). How was I going to be able to develop relationships with all of these students and learn in detail about the activities that they were doing? During my time at FPS, I was easily able to do garden work and interact with FPS students by simply rotating to work alongside year VI girl and boy students in the mornings from 7:15 to 8:00 am. This was less difficult to accomplish because there was only a one half-acre garden and only students from year VI were working in it, whereas at NPS there were three acres of farm land and students were spread out in order to perform multiple activities. A timetable of daily farm work for students (below) illustrates the sheer amount of time in which NPS students were required to be engaged in labor activities at NPS on the farm, which totals an average of 1.5 - 2.5 hours per day. Student tasks from 10:00-10:30 am and 12:30-1:30 pm were done daily, while tasks from 3:30-4:30 pm

varied by day and occasionally were left out because of other scheduled activities such as physical education (student foot races and football (soccer) matches).

NPS Schedule of Daily Farm Work for Students:

- 10:00 to 10:30 a.m.: Most students do cleaning activities on the school grounds while a few groups are told by the teachers or school cook to do the following:
 - Pick spinach from the corn fields (year V to VI girls only)
 - Water the garden (year IV and V boys only)
- 12:30 to 1:30 p.m.: Different groups do the following:
 - **Collect grass and haul it to the cow barn by the armload**—This is general work done by the majority of the students. They are divided into groups, which are overseen by the year V and VI student-leaders
 - **Cattle feeding group** (only boys)—Clear cow troughs of food debris, chop down banana trunks with machetes and haul them to the troughs, chop these into bits in the trough
 - **Cow manure clearing group** (only girls³¹)—Pick up and remove cow manure and food debris wet with cow urine and dump it by the base of banana trees
 - **Goat group** (only boys)—clean the goat stalls and chop food for them (banana tree leaves, branches from bushes)
 - **Chicken group** (only boys)—pick plants for chickens and feed them

³¹ According to a veteran female teacher at NPS, in Chagga culture, this work is the responsibility of females only.

- 3:30 to 4:30 p.m.: In addition to students' responsibilities for cleaning school facilities (only girls mop and only girls clean student and teacher latrines), other farm work can be assigned by teachers such as:
 - 4-H students plant garden
 - Students chop grass for cows
 - Students shuck corn or take out kernels from ears during corn harvest week

Since there were numerous livestock and agricultural activities that students had to do daily at NPS, I asked the 4-H teacher coordinator at NPS to write up the different work items that student groups did. I then rotated working with each group. I chose to keep changing activities on subsequent days so as to gain an understanding for the nature of student farm activities at Nyota with regard to:

- 1) How the work is divided between gender and across different years of schooling.
- 2) How students interact when they go about doing their particular activities.
- 3) How the year V and VI student leaders supervise.
- 4) How the younger students view their supervision by older students.
- 5) How students view the activities that they are doing and what they are learning from them.

I also rotated among groups in order to gain an understanding of the livestock and agricultural procedures followed by NPS students. I wanted to gain proficient knowledge about the general farm work that NPS students did in order to ask interviewees how the school activities compared and contrasted to the farm activities performed in their

households and community. It was my view that if I restricted myself to working with NPS students on only a few of their farm activities, I would not be familiar with the agricultural and livestock processes used at NPS and would not be able to ask the stakeholders in depth questions of comparison between household and school farm practices.

In general, during the time when NPS students did farm work, I chose to work alongside year V to VII students.³² I made this choice because these students had more experience working on NPS school farm activities, many of them were student-leaders who supervised the work of younger students, and they generally gave more articulate responses to questions I had. Occasionally, though, I chose to work alongside the year III to IV students so as to learn about their views on what they were learning and what they felt about the supervision of year V and VI student leaders.

Selection of NPS Students and Households to Interview

I worked with the 4-H teacher coordinator at NPS to select year V-VII students from a variety of households. Since the students in the 4-H club at NPS receive more advanced training in animal husbandry and agriculture than other students at NPS, the majority of the male students that I interviewed were 4-H club members from year VII.³³

After I interviewed students from these different backgrounds, with the help of the 4-H club teacher coordinator at NPS, I arranged to visit the households of students from different backgrounds (poor, educated parent, household of elderly, single parent

³² Year VII students only occasionally worked on NPS farm activities. Most of the time they were studying in their classroom in preparation for national exams, which take place in September.

³³ There were only three female students in the 4-H club.

household, household of different tribe other than Chagga, household of a student-leader) and interviewed their parents/guardians. When a parent was not available from a particular category, I worked with the 4-H club teacher coordinator to select a different parent from this category. The one category of respondent from the list below that I was not able to interview was a student from a household of a different ethnic group other than Chagga. I was not able to accomplish this because all of the students at NPS were members of the Chagga ethnic group.

What I did in order to develop relationships with NPS students from years V to VII. During my time at NPS, I tried to work with students from years V to VII on their farm work and be present in their classrooms as much as possible. I did this in order for NPS students to grow accustomed to the presence of an adult foreigner-teacher in their daily school activities. By consistently being present on Monday through Friday for six weeks from January 16 – February 24, 2012, over time I was able to develop bonds with many of the year V to VII students and get to know them on a personal basis. This is because I participated in the farm activities that they were doing and, while working alongside them, I talked to them informally. In addition to asking them questions about what they were doing, how to do it, and what they were learning from it, the NPS students also had the opportunity to ask me different questions that they had about who I was, where I came from, what crops were grown in my country and what agricultural techniques were used, etc.

In addition to working with students from years V to VII on school farm activities, I spent time observing classroom lessons taught to year V to VII students. I focused specifically on doing this during my first two weeks at NPS. In general, the

lessons I observed were in science and the school subject, studies of work. I found that these were the two school subjects in the Tanzanian national curriculum that NPS teachers occasionally connected to the farm work of NPS students in agriculture and animal husbandry.

Teaching NPS students in order to develop deeper bonds. After my first two weeks at NPS, I also volunteered to teach the year V and VI students in the NPS library. This library room was created in 2010 with funding from the Rotary Clubs from Nyota and the city of Chico, in the state of California in the United States. There were seven shelving units filled with fiction and non-fiction children's books in English and six tables with wooden sitting stools. Although the NPS teachers claimed that they had established specific times, from 3:20 to 4:30 p.m., for NPS students from different classes to work in the library, during my time at NPS I did not observe any NPS students enter the library aside from cleaning it.³⁴ I chose to teach year V and VI students in the library so as to develop relationships with these students more intimately but also to expose them to learning opportunities that could be gained through the reading of books independently.

During my short time working with NPS students in the library, I found that it was a major challenge for them to comprehend the donated texts. The reason for this was that all of the books for children were written in English with no translation in Swahili. During the first two weeks, I read books aloud to the students in English, verbally

³⁴ The one exception to this assertion was that during the time that students were scheduled to clean the library at lunch I observed that one year V boy and one year VI girl student-cleaner spontaneously began to study books in the library. They told me that they were not given permission to do so by teachers but were doing it because they "wanted to learn more."

translated to them in Swahili what was read, and, at certain times during the lessons, selected various students to write new English vocabulary on the board to translate into Swahili.

During my last two weeks at NPS, I worked with students during our library time to develop independent study habits. I had them do this by engaging in sustained silent reading (SSR). During this time, they were allowed to read quietly with a partner, trade books with other students at their table after every ten minutes, and ask me questions or help in reading certain pages. While they engaged in silent reading, I continued to have students come to the board and add to the vocabulary list of words in English that had been written at the board and the Swahili translation of each.

I focused on English learning during this time firstly because those were the only books available in the library, aside from a few dilapidated books in Swahili that had no illustrations and that were at an advanced secondary school level. Another reason I did this was because, based on current NPS pass rates on year VII national exams, the majority of NPS students would be advancing to secondary school. In secondary school in Tanzania, all texts are written in English and teachers are supposed to teach all lessons in English. Observers of Tanzanian education view this requirement as a major difficulty for Tanzanian students who graduate from Tanzanian government primary schools and enroll in secondary schools, as reported in my interview with veteran NPS male teacher, Fuatael Mlay:

A major challenge with Tanzania schooling is that students must learn English in secondary school. English books interrupt the learning development of the Tanzanian student. Years I to VII [of primary school] are in Swahili. If I were

the president of Tanzania, I would change this because many students fail national exams because they fail *lugha* (language).

It was also my aim in the library to give NPS year V and VI students a taste for how to develop independent study habits. One reason for this is because, in my own nineteen months of experience in Tanzania, I observed that very seldom do youth in Tanzania choose to read texts independently and rarely are there shelves of books inside the average Tanzania household.

A subsidiary personal aim of my library work with NPS students was for them to develop journal-writing habits. The reason for this focus was because, although the 4-H teacher coordinator at NPS claimed that NPS teachers gave students writing assignments to carry out, throughout my classroom observations conducted both at NPS (six weeks) and at FPS (six weeks), I did not observe students at either school being given writing assignments, aside from copying notes from the board and copying sentences from textbooks.³⁵ It also was my observation that on all exams (national, region, district, ward, and school) given at NPS and FPS, students are not required to complete any writing sections.³⁶ Unfortunately, I found that I did not have time to have students write journals during the short hour of library time I had with them after school on Wednesday.

³⁵ The one exception to this lack was at NPS, where year V students were required by their veteran female teacher to fill out a short paragraph essay for their monthly exam. The students wrote approximately four lines each.

³⁶ The one exception to this were the school exams at FPS, where teachers reported that they often had students complete a “dictation” section. FPS teachers accomplished the dictation by reading aloud a sentence to students and students were required to write the sentence down that the teachers spoke. During my time at FPS—I was present when end-of-the-year exams were given—I did not observe teachers to do this nor did I observe students engage in writing activities aside from copying notes and solving numeric math problems.

One other impediment was that many students did not bring their writing utensils. This was a significant barrier at NPS because there was not a cache of writing utensils available for students to use.

What I did in order to develop relationships with NPS parents. Similarly to FPS, a major challenge for me was that I was not able to develop relationships with parents prior to conducting interviews with them. Although parents at NPS and FPS often knew who I was due to being told about me by their children, my first interviews with NPS parents were generally cold calls. I attempted to have parents feel more comfortable around me by conducting interviews in the location of their preference. This was typically in their households or in their farm fields. I also explained to them that by talking with me their children would benefit because I would contribute a packet of seeds to NPS's school garden program for each person I interviewed. At the end of interviews I also invited respondents to ask me any questions that they had. This often resulted in richer and more elaborate conversation about the issues that I had asked them about.

I also gave parents a packet of heirloom seeds, which means the seeds from the crops can be harvested and planted again. The reason I did this was because the parents could use these seeds to grow produce that could help to supplement their family's diet, and in the future, they could also expand their planting of this produce by harvesting the seeds from the crops they had grown, if they chose to do so.

What I did in order to develop relationships with NPS teachers. Similarly to FPS, I was able to develop more intimate relationships with teachers at NPS. The reason was because each day of the work week, from Monday to Friday, I arrived at the school at the same time they did and left at the same time at the end of the day. This resulted in

teachers becoming familiar with who I was and what I was doing because they observed me working with students in the farm activities at break times and also because I was often present in the classroom during the lessons they taught. However, I conducted classroom observations only when I was given permission by teachers to do so.

Another reason I was able to create bonds with NPS teachers was because I was given a desk in the teachers' office, and I did my own work alongside them. Often we engaged in conversations about a range of issues (rainfall in Nyota, protection to prevent AIDS/HIV and ways to teach this to students, relationships we had with our intimates, crops grown in the nation of my birthplace in comparison to Nyota, etc.). I also sat down and had tea with NPS teachers at morning break time from 10:00 to 10:30 a.m. —I was often late for this because I worked with students on their farm activities at this time—and we also ate lunch together from 1:30 to 2:00 p.m. Like the other teachers, each month I paid for my school lunch and tea.

As a likely consequence of the ample time I spent with NPS teachers, I was able to develop close relationships with a handful of them. For example, I was invited for dinner at the households of two of the veteran female teachers at NPS. During these more personal events, I was given the opportunity to strike up informal conversations with them and their spouses about issues that were relevant to their lives as well as their family and their community such as the schools their children attended and the school fees they had to pay, the different household income-generation activities they and their families conducted in order to supplement their teacher salaries, for example, animal husbandry and farming, and the lives they envisaged for their children in the future and how this compared to the future lives they felt the children they taught at NPS would

have. After school, I also walked alongside many NPS teachers on the road back home. In addition to having informal conversations with them, occasionally we stopped and shared conversation while having a drink. NPS teachers often said that they would miss me very much after I was gone.

Limitations of the Study

The selected sites, units of analysis, methodology, and positioning for this study all lead to certain limitations, some of which I have already acknowledged in the above discussion. The communities of Nyota and Mchanga villages should not be considered representative of the majority of Tanzanian rural villages. I chose these villages primarily because their primary schools had cultivation programs that seemed to be run more effectively than those in other villages. Additional reasons for the selection of these communities were because these communities were facilitating the trade of their crop commodities (tomatoes in Mchanga and bananas in Nyota) in the emerging East African market and because their students had access to secondary education.

My choice of students and their parents was meant to allow for a study of a diversity of experiences with education and agriculture by which to compare; generalization to the entire Tanzanian primary-age population and/or citizenry based on their experiences is therefore not possible. Given the time and geographical constraints imposed on the study, a sample of students, parents, and teachers allowed me to make observations about and interact with participating students and teachers only within a set time frame.

In choosing students, teachers, and parents as units of analysis for this research, I tried to acknowledge diversity of experience and perspective within the student and

parent body of each community. However, I may have sometimes been unaware of underlying power dynamics in the communities and in the schools. The choices I made about how I spent my time during my fieldwork meant that I did not have sufficient time to examine the experience of parents aside from conducting interviews with them at their households one or two times. I therefore was not able to establish the level of personal relationships with them that I had with teachers and students. This limited the amount and depth of data I was able to collect from different families.

My focus on the experiences of teachers, students, and parents also meant that the time I spent with other actors was reduced. For example, my discussion of the Tanzania Ministry of Education & Vocational Training and the national level is based only on written documents and reports from interviews. This was because I was not able to spend time researching experiences or perspectives of the staff and other stakeholders at this level.

It is possible that additional opportunities associated with school garden/farm programs will be observed by students and their families in the distant future, but perhaps not during the time of data collection for this study. With more time, the study would have assessed both the short and long term consequences for students who graduated from these programs. During my time spent at Nyota village, I attempted to interview graduates from previous years about their experiences with the 4-H program at their school gardens/farms and how it shaped their learning. However, I was only able to interview one 4-H student graduate from NPS. At FPS, in Mchanga village, it was not possible to interview graduates who were involved with their Oikos-supported school garden because the program was only started two years ago.

Another limitation is that this study was not able to conclude that a student's current performance in school is a consequence of her/his participation in a school cultivation program alone. Given the strong consensus that educational outcomes are a product of interaction among various factors including but not limited to socioeconomic status, family background, parents' and siblings' education, and teacher characteristics, this study attempted to assess a variety of factors that influenced a student's current status and plans for the future. The purpose of the study was not causal inference, and many of the factors addressed in the research questions (family/community support for example) were hard to measure accurately. Yet another limitation is that this dissertation selected two schools funded by prestigious, international non-governmental organizations in the country. The students benefiting from these donor-supported schools were clearly better-supported financially and technically by these international organizations. It therefore may be unrealistic to generalize that school cultivation programs will be beneficial for all schools in the country that are not financially supported by external organizations.

Finally, interviews and observations had a number of limitations:

- My presence and approach may have influenced what I observed.
- I may have created bias due to the wording of the questions, i.e., the ability of interviewees to answer questions including technical vocabulary about public education and agricultural depended on their level of educational attainment and experience in these areas.
- Response bias, i.e., interviewees may have reported positive views of the education provided in their community so as to keep a low profile.

- Incomplete interviewee recollection, i.e., responses of interviewees may have been limited due to time constraints and the ability to recall only certain experiences.
- Reflexivity, i.e., interviewees may have expressed what they believe the interviewer wanted to hear. However, this was generally not the case with participants who were interviewed a second time, because they were identified as being willing to provide more candid and detailed responses.

The study attempted to mitigate bias on the part of the researcher by revising questions with feedback from dissertation committee members, Swahili teachers at MS Training Centre for Development Cooperation during the months of June-August 2011, school personnel at FPS and NPS, and a subset of villagers from Ekundu River, Arusha region who were previously involved in school farm activities as teachers, students, and community members.

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CHAPTER 4

Practices in Two Tanzanian State Primary Schools

This chapter will take a broader and more general look at Tanzanian primary schools and how they function. This examination will include a focus on the duties carried out by schools and their staff and what they hope to accomplish through these duties. The emphasis will be on making sense of both school farm activities and classroom instruction. The chapter begins by examining the practices and conditions of state primary schools with cultivation programs in northern Tanzania. It describes the initial research process, where I address basic questions about the nature of school cultivation in this region of Tanzania. I then use the 16 sites I visited to develop a classification of school cultivation, and I discuss how the sites compare in terms of these criteria.

This is followed by further inquiry about the nature of schooling in the two school sites selected for this research. This section concentrates on prevailing practices and important exceptions to these practices. Differences are noted whenever possible so as to recognize diversity in the approaches used and the views about their utility.

Process for Selection of the Two Sites Where I Conducted My Research

For my research, I chose to select two donor-supported primary school cultivation programs in northern Tanzania that were being run more effectively than most. The reasons for choosing two more successful programs relative to the others were that I wanted to (a) explore what donor-supported school cultivation programs could potentially achieve in the current context of state primary schooling in Tanzania and (b)

examine the ways that these schools were successful and how these varying approaches differed in comparison to one another. For example, I wanted to learn about differences in how students, parents, and teachers in these communities thought about school farm activities and the implications of their views on this subject. I also sought to understand what sort of futures stakeholders in these communities envisaged for their students, especially in relation to schooling and agriculture.

In order to select two primary school cultivation programs that were being run more effectively, I visited 16 state primary schools with garden programs from June to December 2011. These schools were all located in the north of the country within Arusha and Kilimanjaro regions. State primary schools with school farm programs in these areas were first identified with the assistance of the MS Training Centre for Development Cooperation and Imara District educational officers in Ekundu River, Arusha Region. These cultivation programs consisted of teachers facilitating school gardens and/or farms where students helped through the provision of labor. As much as possible, I met with head teachers, teacher farm coordinators, and students at each of these schools in order to learn about their existing garden programs. The following is a summary of what I learned while visiting these school sites.

Results from Site Selection Data on School Cultivation in Northern Tanzania
Important Factors in the Classification of the Cultivation Programs at Primary School Sites. The following is a classification of school farms/gardens I formulated after my visits to the 16 schools.

Table 5. Classification of 16 School Cultivation Programs

| | | | | | |
|--------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|
| Initiated and/or guide from outside | Run by the school without outside help: 7 | 4-H garden program: 6 | Oikos garden program: 3 | | |
| Availability of water | Rain water only: 6 state primary schools (4 in Arusha Region and 1 in Kilimanjaro) | Water pump or irrigation: 10 state primary schools (7 irrigated, 3 with water pumps) | Water tanks with water harvesting system from roofs of school buildings: 3 Oikos-supported programs in Mchanga | | |
| What is grown | Corn: 16 | Beans: 9 | Garden vegetables being grown: 5 | Drought resistant crops: 1 4-H and 1 Oikos school | |
| The destination of produce grown | Sold to middleman and/or the community : 13 | Teacher consumption of produce and not students: 3 | Some teacher consumption of produce: 2 | Profits used to purchase school and lunch supplies: 6 | Use of profits determined by students: 6 4-H school clubs |
| Costs of schooling | Families of students must contribute corn and beans for school lunch: 16 | Pay for kitchen supplies for cooking: 16 | Contribute manure: 14 | Contribute firewood: 16 | Pay for additional school fees: exam fees, school guard, etc.: 16 |

Table 5 (cont'd)

| | | | | | |
|---------------------------------------------------------------------|----------------------------------------|-------------------------------------------|------------------------------------------------------------------------------------------------|--|--|
| The nature of student work and what it entailed | Work as laborers: 16 | Involved in selling: 6 4-H schools | Involved in maintaining records: 4 out of 6 4-H schools said to do so, but no evidence of this | | |
| Whether the sites offered learning opportunities to students | No connection to classroom learning: 5 | Minor connections to science and math: 11 | Claim of connection to school subject of "Studies of Work": 11 | | |

Nature of school cultivation in 16 sites considered for further study. The following is a general description of what I learned during my visits to the 16 school cultivation sites.

Schools supported by donors versus being independently run. Donors and other outside organizations play a large role in school cultivation projects, but school farms/gardens can be established and run without outside support. Out of the 16 gardens that I visited, seven were cultivation programs initiated and run by the schools' teachers and students without any outside support aside from community contributions such as manure. Of the remaining nine programs, six were 4-H school cultivation programs, of which four were located in Arusha town and two were located in Moshi Ndogo district, Kilimanjaro. Four of six of these 4-H programs had access to running water at their schools. The other three non-4H programs were schools supported by the Italian-based NGO called Oikos in the same rural village of Mchanga located on the northeastern side of Mount Meru.

Nature of student work. In all cultivation programs I observed students to be involved only as laborers. Unless the school cultivation program was being run by an outside NGO such as 4-H, I found that typically the program required three periods of student work across the school year:

1. When the rainy season in January/February began, students took a full day to plant corn.
2. During the middle of the rainy season during March/April, the students weeded the fields for one full day.
3. Later in July/August, they harvested the corn and cleared the fields. This process took an additional one to two weeks of student work since the students generally needed to shuck the corn and clean the kernels of debris. Typically, students helped in the preparation of the corn and beans by shucking the corn, cleaning the debris, and putting the corn in large sacks.

Aside from the six 4-H club programs and Nyevu state primary school in Ekundu River, Arusha region, students were not actively involved in bookkeeping or supervisory activities for their work in the school gardens/farms. At the six 4-H schools, students were reported to be using 4-H notebooks to keep track of their expenses and profits made for each of their independent activities they were doing on a regular basis. However, I would later find that the 4-H notebooks were no longer being used at all 4-H schools because schools were required to pay for their 4-H notebooks (\$0.13 USD approximately) and the teachers said that they could not afford to do so with the profits made in their 4-H programs.

Whether the sites offered learning opportunities to students. At all of these

schools, I found that there was little or no relationship between the student activity on the farm and student learning in the classroom. According to the teachers, the main reason for this lack of connection was that there rarely was a concept on the national curriculum that was related to the growing of corn and other crops. They said that, aside from a chapter in the textbook for the subject studies of work,³⁷ the national curriculum did not show teachers how to use garden/farm activities in order to teach the curricula content of school subjects. However, teacher responses revealed there to be a handful of exceptions. For example, teachers at 11 of the primary schools reported that students applied the concept of “measurement” in math by using sticks and string to measure the distance between the holes where they planted corn. Teachers at these same 11 schools also claimed that the students were taught about the concept of “the plant cycle” in science by working in the garden.

What produce is farmed and why. At the schools I visited I found that their farm activities primarily involved the planting of corn³⁸ at 16 of the sites and of legumes at 9. The reasons given for why corn was planted was because of the taste, the ease in harvesting and selling it, and because ears of corn are protected by the husks from pests such as birds and insects. In interview responses, these cultural preferences for corn were reported as being a recent dietary change; previously, millet and sorghum were reported as being the staple grains consumed by the communities that hosted school gardens (see

³⁷ The school subject studies of work also includes the learning of other vocational skills such as raising livestock, sewing, and masonry.

³⁸ In the town of Tenguru, which is located eastward from Arusha town alongside Mount Meru, another main staple crop that was grown aside from corn was bananas. This difference is a result of the fact that Tenguru receives significantly more rainfall than other areas in Arusha Region due to being located directly south of Mount Meru

below). Beans were planted with corn because a staple for school lunch in Tanzania is a stew of corn and beans called *makande*.

If water was available, corn was the preferred crop, followed by legumes and garden greens such as spinach. If water was not available, then the schools attempted to just grow corn. As noted above, five of the primary schools I visited planted garden vegetables in addition to corn and beans. These exceptions were the four primary schools I visited in Arusha town and one in Nyota village, Kilimanjaro region, where 4-H programs had been established and which had access to irrigation canals or water pumps. In addition to corn and beans, crops were being planted in the 4-H primary schools with relative success, such as squash, sweet potatoes, rape plant (a poor man's green that is said to substitute for meat), swiss chard, cowpea, and varieties of spinach and okra. The following are field notes from a successful 4-H school garden program in Arusha town:

Currently corn and beans were being grown, avocado and pear trees had been planted this year, and the teachers planned to grow bananas in later years. The crops that are harvested are sold to local people such as parents, and the money that was made paid for a trip to Ngorongoro Crater, the purchasing of seeds, and the extras were divided among the students.

While this excerpt depicts how a variety of different crops were grown and a profit was successfully made, a major reason for the effectiveness of their growing was because of access to water which flowed down from a stream at certain times during the week.

Availability of water and drought-resistant crops. It quickly became obvious to me that adequate availability or restricted availability of water is essential to understand the success of school cultivation programs in this region. Seven state primary schools

had access to irrigated water because they were located at the base of Mount Meru.

Three other schools had water pumps, two of which were 4-H school sites in Kilimanjaro Region. Three of the schools had water tanks, which were installed by Oikos to catch rain water from the roofs of buildings during the rainy season.

At two of the 4-H schools I visited outside of Arusha town, the school farm programs failed due to the lack of rainfall and access to water. At these sites, crops could only be planted when the rains came during the monsoon and rainy seasons. However, during the year 2011, there had been a significant drought, and the corn at the two other school sites without access to irrigation could not be harvested, either.

The following is an excerpt from my field notes when visiting one of these school sites located 15 kilometers below Arusha town:

There is a water pump at the school of Daima, but the water is brought in from a spring in Arusha town, which only comes sporadically. Many students often do not attend school because they are required to help parents with carrying water.

This excerpt illustrates the kinds of hardships many schools without irrigated fields faced due to the lack of rains.

During later visits to Oikos sites in Arusha Region, which is located on the north side of Mount Meru, I learned that many of these programs did not have access to water, but it was not because of lack of rainfall. Although these schools had garden programs supported by the Italian-based NGO, Oikos, and although Oikos was working with village leaders in these communities to provide water access to the schools, I learned that the existing water pipelines within some communities were altered so that water was diverted away from schools. According to the Oikos school garden coordinator:

In Kavuu village, at Kali primary school, we are restoring the pipeline, which is still a colonial structure. It worked perfectly well until [the villagers] broke the pipe and reduced its size to go to the dispensary and the cattle trough. The teachers also cut the pipe and stopped it at the teachers' houses.

The cattle of the Maasai ranchers in this village were allowed to drink the water first, while students were forbidden to fill up their *sados* (two liter containers), which they were required to bring to school daily. The lack of water access resulted in the crops wilting and dying in Kali's school garden. These constraints illustrate the obstacles faced in running a school garden program successfully. Villagers who were farmers or raised livestock also needed access to water in order to fulfill basic needs and to water their crops and animals.

Although Arusha region has received significantly less rain in recent years (Ndomba, 2010), I found only two primary schools to be experimenting with introducing drought-resistant varieties of plants. One exception was Ukame primary school, which has a 4-H garden program in a drier area located below Arusha town. The teachers there informed me that in the previous school year they attempted to grow the drought-resistant crops of sorghum, cassava, and sunflowers. However, they claimed that in the previous year, birds came to eat these crops, and it was too difficult to have students guard the crops throughout the day. This year they planned to grow potatoes and cassava only. The other exception was the Oikos-supported Fadhili primary school in Mchanga village, where the teachers there were experimenting with growing peanuts.

What is done with the crops. The destination of the harvested food was determined by the *mwalimu wa shamba* (teacher of the farm field) who was responsible

for overseeing the operations of the garden and organizing the selling of the produce. In general, these teachers were selected to carry out this work based on their experience as farmers and their motivation to effectively manage the school farm. In some cases, these teachers had studied in a teacher's college with an agricultural focus.

I was informed that the harvested crops were typically sold in order to make a profit for the school. Thirteen of the primary schools did so, and while many chose to sell the crops to middlemen, in some cases, they sold to the families of students and other villagers. The following is an example of how school crops are used at Jiwe Primary School in Ekundu River, Arusha region, which had three acres of farmland:

The school is able to produce six barrels of corn and 15-20 barrels of beans. Many students buy the corn and beans in gallon or two gallon containers, and the remaining produce is kept to cook *makande* (corn and bean stew) three times a week and *uji* (morning porridge) one or two times a week. The excess is sold to a local business. The money made is used to buy extra food products, such as salt, and also to pay a cook. These required contributions of parents were typical of the majority of the schools that I visited. At the six 4-H schools, the crops were sold by the students to villagers or were consumed by 4-H students as snacks on days when the 4-H club was held. Coordinators reported that 4-H students were to be given the freedom to decide how to spend their profits. The students at one 4-H school in Arusha town, for example, decided to go on field trips to visit national parks, such as Lake Manyara or Ngorongoro Crater. At other schools, the students opted to divide the profits amongst themselves and spend the proceeds on school supplies, such as notebooks and pens.

One reason why these 4-H programs were being run more effectively was because

they were located in non-rural areas where technical support was provided by a 4-H district coordinator on a regular basis. At these schools, in addition to growing corn and beans, some students were also involved in after school 4-H garden programs on a volunteer basis. The 4-H teacher garden coordinators were facilitating their 4-H garden programs several times each week after school and on the weekend. Another factor that helped to explain the success of the 4-H programs at schools in Arusha town was the fact that these schools had garden plots which were protected as the following example illustrates. Two years ago, in 2010, a law was established by the chairperson and a school committee that prohibited people from bringing livestock on the school grounds. Now there is a school guard named Yohana, who is Maasai, who keeps guard of the school at nights and during the days with four dogs. The school now did not have any problems with their garden because it was protected. Now whenever someone permitted their livestock to graze on the school grounds, their livestock were held until they paid a 20,000 shilling fine (about \$13 USD). If they did not pay their fine, their livestock was sold.

In general, the 16 schools I visited had at least one and up to three acres of available land for cultivation activities. In many cases, not all of this land was used for school cultivation activities. Thus, one method for generating revenues reported at three schools was the renting of the school farmland to local farmers. An acre of land could be rented by a farmer annually for as much as 125,000 shillings (\$79 USD approx).

School and lunch supplies were also purchased through profits at six of the primary schools. The earned revenues from the harvested school crops were reportedly used to pay for lunch ingredients, such as salt and oil, and the school cook, as well as for

certain school supplies and staff, like notebooks, pens, and the school guard.

At most schools, I was informed that a portion of the harvest was also used in cooking the school lunch for the students, as the government provides no funding for school lunch. At two of the primary schools in Arusha Region, it was reported that a portion of the corn and beans was used to feed disadvantaged students at their school who could not afford to contribute the required quantity of corn and beans .

However, at the schools I visited I found that there was no evidence that the harvested crops were allocated solely for student consumption. My discussions with teachers at these schools often suggested that teachers were inequitably taking the harvested crops or were using the revenues generated irresponsibly. Teachers gave many reasons for this behavior, and said they took the food because the salaries of teachers were insufficient and they had many work responsibilities to carry out at school that rendered it difficult for them to procure and prepare food for themselves in addition to following their demanding school work schedules. I was informed that these factors forced teachers to supplement their income through other means such as through farming, animal husbandry, and transport, as well as personal use of school crops.

In three out of the 16 schools I visited, I was informed by teachers that large portions of the school farms and gardens were used only for teachers and not for students at all throughout the year. The following example from Ukame Primary School illustrates what was found at these schools:

There is a total of four acres of school land. Two acres are used by the 4-H program, while the other two acres are cultivated exclusively by teachers. Corn is primarily planted.

In two other cases it was found that many or all crops were grown specifically for teachers at particular growing seasons during the year. The following example from Kijani Primary School illustrates what was found at both of those schools:

The teacher confirmed that teachers used all of the crops grown on their two-acre field in the growing season from October to February but not during the growing season from March to August.

At one particular school site supported by Oikos in Mchanga village, Arusha Region, I found evidence of thievery by teachers. The following is a quote from the Italian-based non-governmental organization Oikos' school garden coordinator, who confirmed the misuse of school crops by teachers there:

[The school garden program at] Ndogo is not functioning well. The teachers there have not kept accounts of where the profits made from the selling of garden produce were spent. The 21,000-40,000 shillings made each month were spent on sugar and soda for the children. How the rest of the money was spent was not reported. Same with the profits made from the renting of their school's fields to farmers.

These examples provide evidence that it is an accepted practice within Tanzanian schools that a significant portion of harvested crops is allocated to teachers. As an outsider, I expected there to be certain rules about this so as to avoid misappropriation of harvested crops by teachers. In my questioning of teacher personnel within these sites, I was not able to determine any clear figures regarding the percentage of crops that should be allocated to teachers and to students. This implied to me that unless the school committee, comprised of parents, intervened strongly in the management of school

finances and resources, the teachers were left to themselves to determine the proportion of harvested goods and generated revenues that would be allotted to them. I found no evidence that the school committee intervened strongly in any of the schools I visited or in the two sites for my research.

Costs of schooling. Although in general it was reported that a portion of the harvested food was used in the cooking of school lunch for students, the families of each student were required to contribute a certain amount of beans and corn each semester to be used in the school lunch. Typically this was about 25 liters of corn and 10 kilos of beans per student each year. In addition to paying a variety of other school fees, such as for the school guard, cook, exam fees, school and lunch supplies, families of students were generally required to contribute a few kilograms of manure several times a year as well as purchase pens, notebooks, and school uniforms for their child. Respondents reported that the costs for one year of primary schooling for a Tanzanian child were high, and they typically came to a total of 135,000 shillings (about \$85 USD). They also reported that the fees were even higher for secondary education: 200,000 shillings (\$125 USD approximately) in the first year; 150,000 (about \$93 USD) for the second; 90,000-120,000 for the third year (about \$55-\$74 USD); and 200,000 (about \$123 USD) for the last year because of graduation fees and tests. What I later learned in interviews was that these fees were considered to be unaffordable for many low-income families. For example, Masawe, the NPS mother of an impoverished household, shared:

Every day I think about how I will feed my children when they come home. How can I pay for school fees? Next year I will have to pay 350,000 shillings (\$200 USD approximately) for my two children who will both be in secondary school.

This mother was able to afford school fees only by selling her family's only cow and by visiting the house of a wealthy landowner in town to ask him to pay for a portion of her daughter's secondary school fees.

Criteria for a Successful School Farm Program

In order to gain a clearer perspective about the various components of each school's farm program, I formulated a checklist of criteria for a successful school farm program (see Criteria for a Successful School Cultivation Program, below). This checklist was based on my review of school cultivation literature (see also: chapter 2). On each item the school could receive a maximum score of 4/4 and a minimum score of 0/4. Since there were 27 items included, the maximum score a school's cultivation program could receive was 108. These ratings were not meant as definitive but rather as a quantification of my own judgment that could serve as the basis for a selection of the final sites to study.

Criteria for a Successful School Farm Program:

- Empowerment of students:
 - Students are empowered to be actively involved in the upkeep of the garden on a consistent weekly basis (___/4)
 - Students are empowered to be involved in the organization and planning of the garden on a consistent weekly basis (___/4)
- Garden activities are talked about as being connected to student learning academically:
 - Directly tied to learning of science curriculum (___/4)
 - Directly tied to learning of math curriculum (___/4)

- Directly tied to learning of other academic curricula (✓/4)
- Garden activities are talked about as being connected to non-academic student learning:
 - Encourages work ethic (✓/4)
 - Improves self-esteem (✓/4)
 - Provides positive opportunities for social networking (✓/4)
 - Teaches students valuable skills that are perceived to improve their livelihoods and that of their families (✓/4)
- The program is sustainable:
 - Garden input fees paid for with garden output (✓/4)
 - The funding for this program is not dependent on student fees for its upkeep (✓/4)
- Garden produce is used as a significant portion of food used to cook school lunches:
 - Garden produce improves hunger issues for students (✓/4)
 - Garden produce used in school lunches increases attendance of students (✓/4)
- Garden produce is used to earn funds for students and for school fees:
 - The selling of garden produce is used to significantly reduce costs for students and for other school expenses (✓/4)
 - The students are directly in charge of bookkeeping for the selling of garden produce (✓/4)

- The students are directly involved for determining how the profits from school gardens are used (✓/4)
- Garden produce or profits from gardens are not appropriated by teachers (✓/4)
- Community members actively support the garden program:
 - Community members consistently offer support for the program (labor, sharing expertise, or cost-sharing) (✓/4)
 - Community members directly learn from the garden (✓/4)
 - Community members with agricultural expertise help to advise those involved with the school garden and especially the teacher in the leadership position for overseeing the garden (✓/4)
- Teachers are responsibly using the garden:
 - Garden activities are not used as punishment (✓/4)
 - Teachers at the school are running the garden program effectively (✓/4)
 - Teachers are knowledgeable about how to apply garden learning in their classrooms (✓/4)
- Garden is run efficiently:
 - Water issues for the school garden are being adequately addressed (✓/4)
 - Artificial fertilizers and pesticides used for school garden are not used (✓/4)
 - High quality crops at school are grown successfully (✓/4)
 - A variety of different produce is being grown successfully (✓/4)

Note. Additional discussion of each criterion is found in Appendix A: A Summary of the

Ratings that Schools Received in Relation to the Criteria for a Successful School Farm Program.

Selection of the Two Sites, NPS and FPS, For This Research

Both schools were selected for this study because I viewed the farm activities at each to be the most successful in comparison to the other 14 state primary schools with gardens that I visited.

Fadhili Primary School and Its Community

Facilities and training common to both programs. Large-scale commonalities between both programs are as follows:

1. A number of teachers received training in how to run agriculture programs (and livestock programs at NPS): Teachers at both schools worked together in school cultivation work and filled in for a particular teacher when they were absent.
2. Teachers were viewed by their community, their students, and themselves as committed to supporting their students: Teachers at both schools offered additional courses for students typically not available in the other schools. At NPS these courses were offered on the weekends and students had to pay. At FPS these courses were offered in the months from May to September in preparation for national exams and teachers were not paid.
3. A water pump had been successfully installed at each school: In reality, lack of a water pump would render agriculture activities obsolete in any given context. At FPS this pump was installed by Oikos and at NPS it had been installed with 4-H-funding.

Description of FPS. There were 362 students and 8 teachers at FPS. The

teaching staff was comprised of four individuals from the Meru ethnic group, three from the Chagga ethnic group from Kilimanjaro, and one that was from the Pare ethnic group located south of Kilimanjaro. Each teacher had 45 students per classroom on average. However, since the head teacher must fulfill administrative responsibilities, he often remained in the teachers' office. The FPS head teacher only taught 12 classes per week, while all other teachers taught 20 to 28 subjects. Therefore, all other teachers must teach larger class sizes of approximately 52 students each when the head teacher is not teaching during the school day. The size of the school and its teachers was important to me because I wanted to conduct research in a community where there was a school population of roughly 300 to 400 students and 7 or more teachers. The other primary schools I visited averaged an amount of students and teachers around this number, and I wanted to make sure that the school site for my research was similar in makeup.

Description of FPS facilities. FPS is a relatively new school, and the facility was only six years old at the time of my research. What I was interested in about the school facilities – and this information would later help me understand its school cultivation projects – was the extent to which the community took initiative in contributing to the various ongoing projects at the school in comparison to the donors. I learned that with Oikos support the following projects had been initiated:

- Twenty fruit trees (avocado, mango, lemon, orange) had been planted in the back of school grounds.
- New classrooms were being built in front of the existing school—the agreement was that Oikos would match the amount of funding provided for school construction by the community. Later during my revisit to the community in the

rainy season I would note that the construction had come to a halt as a likely consequence of limited incomes due to the drought.

- A wind turbine was installed by Oikos during the time this research was conducted.
- Lights had been installed in classrooms through Oikos funding.
- A garden for the Fadhili women's group was being initiated alongside the school's garden – the women's group planned to divide the proceeds of the profits made.

There were five classrooms and the teachers' office in the main building of the school. To the side of the school was a small facility for cooking, which included a stove fueled by firewood. Funding for this kitchen was provided by Oikos.

On the other side of the school grounds, there was another complex where the head teacher lived. He was the only FPS teacher who lived in teacher housing near the school. The rest of the teachers lived in other areas throughout Mchanga village. The middle room in this complex was used to store corn and beans for school lunches and the room to the right is a small classroom where kindergarten classes were held during the morning.

School land allocated for gardens. There was one half acre of fields on which the school's garden was planted. This field was expanded to 3/4 acre during the time I conducted research there because lettuce was transplanted. The teachers planned to plant another acre with corn during the rainy season. However, during my revisit to the community during the rainy season, there was a major drought and this additional acre of corn could not be harvested.

Why FPS was selected as a site for this study. I first visited Fadhili Primary School (FPS) in Mchanga village because it was reported by Imara district leaders as being a school with a successful cultivation program. Later I learned that the program there was supported by the Italian-based, non-governmental organization Oikos. When I went to visit the Oikos office in Arusha town, the Oikos school garden coordinator reported that the FPS school garden program was their “best functioning program”: With the support of Oikos the teachers there have successfully implemented school meals and grown school gardens and fruit trees there.

I decided then to visit FPS. My first visit to the site supported the assertions made by the Oikos staff.³⁹ This can be illustrated by this excerpt from my field notes: The school had four acres of land and one acre was being used for the school garden. They were only growing ¼ of an acre during my initial visit, but they were already preparing fields to expand for next growing season. I learned that all of the produce grown at the school was used to cook food for school lunch. The students also contributed two *debe* (sacks) of corn and one *sado* (two liter container) of beans two times per year. The students also paid 5,000 shillings (\$3.00 approximately) per semester for the labor of the cook as well as for salt and oil.

In addition, with Oikos funding, a variety of fruit trees had been planted at the school. This included pear, mango, papaya, and orange trees. During the rainy season, corn, beans, and tomatoes had been planted. I was informed that they planned on only planting beans this year during the rainy season because last year they did not receive much rain and beans only needed three months of rain in order to grow.

³⁹ Later visits would yield a different picture.

Unlike other schools I had visited where livestock were not prohibited from entering the garden, the teachers said that they did not have any problems with livestock eating their garden produce because they now had a nighttime guard. There was also a law that the livestock caretakers would be fined 1,000 shillings (66 US cents approximately) if their animals trespassed on school grounds or more depending on how much school garden produce they consumed.

The students worked in the garden every day from 7:30 a.m. to 8:00 a.m. Monday through Friday. Only year V and VI students worked in the garden, while year IV students tended the flowers and shrubbery in front of the school. The students also worked in the afternoon in the garden on Wednesday from 2:30 a.m. to 3:00 p.m.

My first visit to the site supported the assertions made by the Oikos staff. I rated FPS as having a score of 82 out of 108 based on the above criteria of a successful school farm program. This positive rating was based on the following components:

- the students were involved daily in garden work;
- the students worked in teams in the garden;
- garden learning was reported to be applied in the studies of work school subject and occasionally in science;
- students learned organic farming skills and were said to apply these skills in their community;
- no costs were incurred by families for school garden program, but they contributed corn and beans for school lunch;
- there was no evidence that garden produce was excessively appropriated by teachers;

- there was a school lunch program and the crops from the school garden, primarily garden greens, contributed to the school lunch;
- some community members such as village leaders and a women's group were trained by Oikos;
- the garden program was being run organically with no artificial pesticides or fertilizers being used; and
- a variety of different crops were being grown successfully (spinach, lettuce, cow peas, African nightshade, okra, peanuts, and beans).

The school garden program at this school rated higher than any of the other 14 state primary schools I visited prior to FPS. However, there were a number of features of the FPS school garden program that I rated as being weak. Particularly, there was only minimal evidence that the school subject learning was being applied in the garden; this application was done only through the school subject of studies of work, which included a range of subjects such as agriculture, health, nutrition, and vocational education subject areas such as sewing and carpentry. Also, aside from learning organic agriculture skills, there was scant evidence that the students' garden work was being used to promote non-academic student learning such as record keeping skills, fostering positive opportunities for social networking amongst students, or improving self-esteem. Still, the Oikos school garden program at FPS received a total score of 76%, which placed it higher than all of the other schools I visited, none of which had previously received a score higher than 45%. It was for these reasons that I selected FPS as one of the school sites for my research.

Mchanga and the FPS community. The hamlet of Fadhili is located a few kilometers up from the village of Mchanga. According to the 2002 census, Mchanga is a village with a population of 16,988, and it is an administrative ward of Imara district, which is one of six districts in Arusha region. It is located to the northeast side of Mount Meru, a prominent volcano with an elevation of 4566 meters, in the Arusha region of northeastern Tanzania. Mount Meru is the second highest peak in Tanzania after Mount Kilimanjaro, which is just 60 kilometers eastward.

The size of the community was important because I wanted to choose a community located in a rural area where there was a relatively large number of inhabitants. I wanted to do this because I was interested in studying diversity amongst villagers in terms of their experiences and positions of employment; the likelihood of being able to do so would be higher in a larger rural community such as Mchanga, especially because the village is located on the other side of Mount Meru from Arusha town and many villagers may have educational experiences or employment opportunities there or in Kenya, which is only an hour away by car to the north or east of Mchanga. The Fadhili community is comprised of farmers from the Meru ethnic group. Their homesteads are generally positioned on irrigation canals flowing from Mount Meru.

Description of agricultural activities in the FPS community. The main crop that farmers plant in this region is the tomato. Unlike many other crops, the growth of tomatoes is not negatively affected by the water in Mchanga, which historically and currently has had a high fluoride content. Through using irrigation and pumps, farmers can grow tomatoes all year round, thereby attaining higher prices in the dry season when the supply of tomatoes decreases but the demand for tomatoes remains high.

Agricultural conditions in FPS community. Land and water conditions in this community allow for agriculture. However, conditions on the other sides of Mount Meru, away from its southern slopes, are much less favorable. In the plains between Mt. Kilimanjaro and Mt. Meru, rainfall historically decreased to less than 500 millimeters, which is not enough to sustain agriculture. North of the mountain, rainfall also decreases 500 to 750 millimeters on the eastern side, and a rain shadow is present on the northern end. In the east and the north, the water is too alkaline to use for irrigation. The soils are also of low quality, reported as “light powdery volcanic ash easily swept up or dissolved in water” (Spear, 1997).

Although Mchanga has irrigated canals, which flow from Mount Meru, Mchanga’s water is of poor quality. Due to the low quality of the water flowing from Mount Meru, farmers are unable to grow many different types of crops; for example, the avocado and mango trees donated by Oikos failed to grow because of the water quality during the time I spent conducting research in the community.

Brief history of agriculture in Mchanga village. While investigating the village history, I focused on learning about the current status of agriculture in this village compared to what was grown historically and how much the villagers were able to function independently in doing so. I wanted to discover whether the village adhered to traditional agricultural approaches used by Meru farmers or whether they were influenced by the agricultural and livestock practices of the European colonizers. I learned that they were mainly using monocultural agricultural practices in recent times that were similar to the British such as in their growing of corn or tomatoes. After the British defeated the Germans in World War I, the British maintained an iron ring of occupied land around

Mount Meru. Originally this territory had been established by the Germans, around the lower area of which only European settlers were permitted to clear and develop. However, the British acquiesced to the demands of the Meru and Arusha ethnic groups, and allowed them to have access ways by which to move their cattle to the lowlands to graze. The Meru ethnic group was allowed to inhabit the land around Mount Meru to the east, where the village of Mchanga became established in the 1930s. When the land of Mchanga was violently reoccupied by the British in 1951, this led to mass protest by the Meru, and they became the first indigenous group to appeal to the United Nations. Their non-violent movement led them to eventually regain their rights to the land around this mountain. Their highly-organized effort in protesting and raising funds to send representatives to the United Nations in New York also helped to facilitate the gaining of Tanzanian independence in 1963 (Spear, 1997).

Nyota Primary School and Its Community

Description of the school. NPS was situated on three acres of land near the center of the village. There was one acre on which bananas were grown and one and a half acres where corn was planted. Within the school courtyard, there was a small $\frac{1}{4}$ acre space designated for 4-H gardening activities. There were also the structures for cows, pigs, and chickens detailed below.

This land was donated to the community by missionaries from a teachers' college located next door. I was informed by elderly villagers that the missionaries had historically been supportive of schooling initiatives in the Nyota village and had decided to donate their land in order to found a public elementary school in the community. During my time spent at NPS, there were 296 students and 15 teachers at the school. The

average classroom size per teacher was only 20 students. However, one of the teachers worked solely in the teacher resource room, while the head teacher only taught math to the year VII students, so the average teacher-student ratio was approximately 23 students. Each teacher taught from 20 to 26 lessons per week, which was similar to the amount of classes that were taught by the teachers at Fadhili Primary School. The classroom enrollment at NPS for each grade was as follows: 39 for year III, 46 for year IV, 42 for year V, 60 for year VI, and 32 for year VII. Like FPS, NPS had an appropriate size for my study because there was a school population of nearly 300 students and 7 or more teachers.

Description of NPS facilities. One of the notable aspects of the NPS facilities was the fact that they were built by the community. This aspect was important for me to consider because the willingness of the community to participate in school projects such as construction initiatives or preparation of its farm fields would help me to understand the views of villagers about supporting schooling in their community and the influence those views had on the school. During my initial visits to NPS, I learned from, Otto Moshi, the former chairperson of NPS, that the school was built due to community contributions:

The villagers built this school by selling livestock and coffee to buy bricks. We were able to dig a well and build toilets, a kitchen, dining hall, and corridor.

The school itself had a shady courtyard due to the many deciduous and pine trees that were planted. I was told that the trees were planted by students a few decades ago, many of whom are now the parents of students here. The main building of the school consisted of six classrooms and a teachers' office, an office for the head teacher, and a teachers'

resource office. There was another classroom in an adjacent building.

As the quote from the former NPS chairperson, Otto Moshi, above shows, there was a clear history of community contributions for the construction of school facilities at NPS, which included the following projects:

- a tree planting initiative that extended back to the generation of the NPS parents;
- a dining hall constructed with funding from Rotary Club and community contributions (This was also the place where meetings with parents and school assemblies were held.);
- a school library room with supplies donated by the Rotary Clubs in Nyota and the United States;
- a water pump and two large water basins constructed with funding from the Rotary Club—the water basins have ten different faucets each so that students can wash their hands after they use the bathroom or before they enter the dining hall at lunch; and
- a teacher meeting room in the Nyota cluster—funding for this was provided through school farm profits and community contributions.

Why NPS was selected as a site for this study. I visited Nyota Primary School in Nyota village, Kilimanjaro Region after visiting with the 4-H Moshi Ndogo District coordinator. During our chat, he stated that NPS was the most successful 4-H farm program in his district. My visit to the site with the coordinator supported the assertions made by the 4-H district coordinator. At NPS there were two acres of bananas and one and a half acres where corn was planted. While I was there, there were fields of corn growing that would be harvested in January. Then the fields would be prepared for the

March rains.

What was surprising about the program at NPS was that the veteran female 4-H teacher, Aneti Elisa, worked with the children in what appeared to be a very successful livestock program. There was a barn with six cows and four goats, in a separate enclosure there were eight chickens, and in another enclosure there were several pigs. Aneti Elisa said that in addition to her having experience in the raising of livestock and her husband being a doctor, there was also a veterinarian in town who could prescribe naturopathic remedies as well as store-bought medication.

The school rated 80 out of 108 based on the above criteria for a successful school farm program. This rating was much higher than the ratings given to all other schools I visited aside from FPS. The high rating was based on the following components:

- students worked every day on farm and livestock activities;
- farm activities were used as a physical exercise and to develop work ethic and self-esteem;
- students learned organic farming skills and the farm program was entirely organic;
- the farm activities were paid for with profits made from the selling of crops and livestock, and the students did not pay for the program's upkeep;
- school farm crops contributed to school lunches for students;
- the teachers claimed that students were responsible for keeping track of profits in their notebooks;
- the teacher in charge, Aneti Elisa, had expertise in organic farming and livestock management due to being trained for five months by students from the Kenyan

Institute of Organic Farming (KIOF);

- a variety of different produce was grown (cabbage, lettuce, African nightshade, spinach, beans)
- there was no evidence that garden produce was excessively appropriated by teachers; and
- diffusion from livestock and organic farm/garden programs in the community appeared to be very likely and worthy of study.

The program received a total score of 74%, which placed it higher than any of the other 15 state primary schools I visited aside from FPS. It was for this reason that I selected this school as the second site for my study. However, there were a number of features of the NPS school garden program that were weak. As with FPS, there was only minimal evidence that school subject learning was being applied in the garden; this was done only through the school subject of studies of work. Also, water could be accessed only sporadically by the students and therefore their crops could not be watered every day. Furthermore, as I would learn later, students at NPS were no longer using their 4-H notebooks to keep records of profits and costs incurred.⁴⁰

Nyota and the NPS community. Nyota Primary School is located in Nyota village, which is a collection of four villages in the southern highlands at the base of Kilimanjaro. Nyota village sits on the southeastern slope of Kilimanjaro at an altitude of about 5,000 feet above sea level. It is wedged in the narrow sliver of land between Mount Kilimanjaro to the west and the Kenyan border. Unlike other villages at the base

⁴⁰ On this first day it was reported to me that 4-H students did use these notebooks. When I began conducting research at NPS on a regular basis, I would learn that this was not case.

of Kilimanjaro, Nyota village no longer has water flowing down to it from Mount Kilimanjaro. The agricultural officer in Nyota attributes this change to be due to deforestation and climate change.

The regional capital of Kilimanjaro, Moshi town, is about 40 kilometers away from Nyota village. Kilimanjaro is one of the country's 27 regions, and it is similar in size and shape to the state of Delaware in the United States of America. It is divided into several districts. Moshi town, in the northern part of the region, is among those districts.

Nyota village is located in Nyota north ward. Combined, Nyota north and south wards are comprised of about 160 square kilometers on a southeastern slope of Mt. Kilimanjaro. The wards' population of 45,000 is spread over 10 villages and the population is subdivided into the two administrative wards. Nyota north ward is located in higher altitudes below the base of Mount Kilimanjaro National Park and has fertile and lush rolling hills, whereas Nyota south ward has dry plains that are more highly populated. Nyota village is located in Nyota north ward. The size of the ward was important because I wanted to choose a community located in a rural area but with a larger population so as to reflect diversity amongst villagers in their education and positions of employment. Nyota village was also attractive to me as the site for my research because there was an influx of commerce and ideas since it was located in relative close proximity to Moshi town.

Description of agricultural activities in the community. Agriculture is the only economic activity for the majority of the villagers. The main crop is bananas, which is sold in the Nyota market to an influx of traders from Kenya and coastal locations in Tanzania, such as Dar es Salaam and Zanzibar. Previously, farmers grew coffee in

plentitude, but when the world market prices dropped during the 1990s and early 2000s after the peak in 1986 (Mmari, 2012), elderly Nyota villagers reported that the majority of the farmers in Nyota burned their coffee trees and only planted bananas thereafter.

Land and water conditions in Nyota. The southern and southeastern sides of Mt Kilimanjaro lie within the district of Moshi Ndogo. These areas have good volcanic soil and are among the most densely populated rural areas of Tanzania. Although this area previously received year-round rain, the amount of rainfall has significantly decreased in recent years (Ndomba, 2010). Nonetheless, this area receives substantially more rain than in other areas of northern Tanzania.

Choosing a school with access to water was important in the selection of the site for my research because this meant that the school would be able to effectively implement a school garden program. At NPS I learned that they had limited water that they used in their ¼ acre garden plot located in the front courtyard of their school. Teacher Aneti Elisa said that they were not able to expand their garden program because of the lack of water accessible through the piping system of water provided by their ward. Instead, they grew a small garden of African nightshade, spinach, and “Chinese” lettuce. The school also had three and a half acres of farmland on which it grew bananas, corn and spinach successfully. It also had an animal husbandry program which was self-sustained.

Brief agricultural history of Nyota village. When German missionaries came to the area in 1893, the Lutheran faith began to gain a strong foothold here. The vast majority of the populace today are Lutherans, while the rest are Protestants, Catholics, or followers of an indigenous religion. The people of this community are from the Chagga

ethnic group. Their language is Kichagga, but the majority of villagers can also speak Swahili. English is the language used by the educated and by those who work in the tourism industry. High population growth rates and lack of family planning has, in general, meant that many family plots have been subdivided into pieces too small to sustain a family. Nyota farmers were very successful in growing coffee during the 1970s and 80s and also in growing bananas in the 1990s and 2000s. As explained below, they willingly contributed personal funds for schooling initiatives at NPS.

Description of the school. NPS is situated on three acres of land near the center of the village. There was one acre on which bananas were grown and one and a half acres where corn was planted. Within the school courtyard, there was a small $\frac{1}{4}$ acre space designated for 4-H gardening activities. There were also the structures for cows, goats, pigs, and chickens explained above.

The school's land was donated to the community by missionaries from a teachers' college located next door. I was informed by elderly villagers that the missionaries have historically been supportive of schooling initiatives in the Nyota village and decided to donate their land in order to found a public elementary school in the community. During my time spent at NPS, there were 296 students and 15 teachers at the school. The average classroom size per teacher was only 20 students. However, one of the teachers worked solely in the teacher resource room, while the head teacher only taught math to the year VII students, so the average teacher-student ratio was approximately 23 students. Each teacher taught between 20 to 26 lessons per week, which was similar to the amount that the teachers at Fadhili Primary School taught. The classroom enrollment at NPS for each grade were as follows: 39 for year III, 46 for year IV, 42 for year V, 60 for year VI,

and 32 for year VII. Similarly to FPS, NPS had an appropriate size for my study because there was a school population of nearly 300 students and 7 or more teachers.

Description of NPS facilities. The willingness of the community to participate in school projects such as construction initiatives or preparation of its farm fields was important for me to consider because this would help to understand the views of villagers on supporting schooling in their community. In my initial visits to NPS I learned that the school was built due to community contributions:

The villagers built this school by selling livestock and coffee to buy bricks. We were able to dig a well and build toilets, a kitchen, dining hall, and corridor. – Otto Moshi, NPS former chairperson

The school itself has a shady courtyard due to the many deciduous and pine trees that were planted. I was told that the trees were planted by students a few decades ago, many of whom are now the parents of students here. The main building of the school consists of six classrooms as well as a teachers' office, an office for the head teacher, and a teachers' resource office. There is another classroom in an adjacent building.

As the quote from the former NPS chairperson, Otto Moshi shows above, at NPS there was a clear history of community contributions for the construction of school facilities which included the following projects:

- a tree planting initiative that extended back to the generation of the NPS parents;
- a dining hall constructed with funding from Rotary Club and community contributions (This was also the place where meetings with parents and school assemblies were held.);

- A school library room with supplies donated by the Rotary Clubs in Nyota and the United States;
- a water pump and two large water basins constructed with funding from the Rotary Club – the water basins have ten different faucets each so that students can wash their hands after they use the bathroom or before they enter the dining hall at lunch; and
- a teacher meeting room in the Nyota cluster – funding for this was provided through school farm profits and community contributions.

Commonalities and Variations in Practices Between NPS and FPS

The following section concentrates on prevailing practices and important exceptions at NPS and FPS schools. The purpose of this section is to illustrate some of the general practices I observed in classrooms at NPS and FPS based on the areas to which teacher time is designated. Differences are noted whenever possible so as to recognize diversity in the approaches used and the views about their utility.

Teacher Engagement and Attendance

One of the most notable patterns in teacher engagement was the fact that most teachers did not teach all of the classes scheduled for a given day. For example, a year VI student from the Chagga ethnic group explained:

Our teachers only teach us one to three subjects out of seven each day, which are usually only English, math, or Swahili.

My time spent conducting research at both schools supported the assertion given by the student above. I found that teachers at both schools interacted with their students as little as possible. Aside from the classrooms of a few more motivated teachers at each school,

I observed that students were frequently left alone in their classroom at both schools, and teachers spent time supervising students and teaching them only to the extent that teaching duties were enforced at their school. The following excerpt from my field notes is an example that illustrates the general teaching habits of the majority of teachers at NPS, especially on the frequent days when the NPS head teacher was not present:

The students began working on shucking the corn from the harvest after morning break and would do so throughout the day. All of the female teachers at NPS except for the veteran female teacher Mary Jesta Urasa remained sitting in the office along with the veteran male teacher Fuatael Mlay. Much of this time the women significantly devoted to chatting amongst themselves. But they were also writing their required teacher lesson plans.

Throughout the weeks I spent at NPS, I found that teachers were regularly excused from their teaching duties because they had weekly teachers' meetings. At FPS it was the general practice for the majority of teachers to remain in the teachers' office,⁴¹ particularly at the beginning of the day. The majority of FPS teachers also infrequently followed their schedules in the afternoon. The following excerpt from my field notes illustrates the typical teaching habits I observed for teachers at their school:

At the start of the day [at FPS] none of the teachers were in their classrooms. I went into the year six classroom and, as usual, the students looked up at me in earnest hoping that they would be taught. A year VI boy eyed me and said, "Please, teach me." Later, after twenty minutes, the teacher entered the classroom. He began teaching them conversions of millimeters to

⁴¹ The following chapter 5 will provide a more in-depth analysis of the teaching habits of teachers at both schools.

kilometers...When he finished teaching the lesson after ten minutes, [he] assigned the students work and then left the classroom. The students were left alone once again.

Differences in engagement demonstrated by individual teachers. I observed that the duties of teacher farm coordinators at FPS and NPS on the school farm and garden were often given higher priority than teaching students in their class. These particular teachers expressed passion for farming and were dedicated farmers back home with decades of experience since their childhood. Many had studied in agricultural colleges and were knowledgeable in these areas. As the following passage from my field notes illustrates, I observed these teachers showing kindness in their interactions with students. Their students responded by respectfully listening and following the instructions given:

The teacher taught the 4-H students how to mix carrot seeds with sand and pour this mixture quickly over the soil in the divots, [instructing,] “You mix the sand in with the carrots in order to make sure that you don’t plant too many seeds in one of the divots. You spread the mixture in your hands very quickly over the divot. Very quickly! Rrrrr!...Rrrr!” As the teacher made the soft “Rrrr” sound with his mouth, he spread the sand/carrot seed mixture over one of the divots. He made the “Rrr” sound in order for the boys to understand how quickly they should apply the seeds. The boys then spread the seeds in other divots in that row and imitated the sound the teacher made.

I also observed that FPS teachers who were responsible for garden activities frequently exhibited motivation to carry out work in this area effectively. The veteran male teacher, Emanuel Stanley Urrio, and the beginning teacher, Florah E. Makyao, from the Pare tribe at FPS often were directing school garden activities throughout the school day, as illustrated by this excerpt from my field notes:

At the beginning of the school day, teachers Emanuel Stanley Urrio and Florah E. Makyao were working together cooperatively as the school garden coordinators. They were each giving instructions to separate groups of students. Urrio was showing the girl students how to transplant lettuce. Florah E. Makyao demonstrated to a few year VI boys how to hoe the ground around the peanut plants. After this they spot-checked that all of the seedlings were watered and that the tools were put in their correct places.

These behaviors of the two school garden coordinators at FPS stood in contrast to other teachers at NPS, who often remained in the office to carry out their particular duties while not adhering to their classroom teaching responsibilities. Again, from my field notes:

For most of the morning I remained in the office of the teachers at Fadhili Primary School. When the school day began, the teachers remained in the teachers' office for the next hour... The teachers reviewed the tests that were printed up by a private typist in Arusha town that they would give to their students. All other school learning activities were put on hold.

Although I observed that some teachers selectively spent time with students in farm and classroom learning activities, at both schools I observed that teachers frequently missed the scheduled school subjects they were supposed to teach.

History of teacher absenteeism in Tanzanian state schooling. While interviewing teachers, one reason I found for teacher absenteeism was the accepted culture of avoidance of teaching responsibilities. This was even acknowledged by certain parents, such as Masawe Morera, an NPS mother from an impoverished household:

In Tanzanian culture [teacher absenteeism] is okay because many teachers need to go to the market. If the teachers have students go to the market and buy food to return to the home of the teacher this is because the students are their children, too.

Many other parents expressed similar opinions. Their responses revealed that this culture of teacher absenteeism had historical roots in Tanzania culture after attaining independence. For example, as a mother below from a single parent household, Mwanaidi Martin, acknowledged, parents did not have high expectations for teacher attendance because in their own experiences as students in Tanzania their teachers did not adhere to their teaching schedules:

When I was a student [at NPS] the teachers were irresponsible. They were constantly truant or absent. There were days when all we did was play out in the field for the entire day or stay in a class and only one subject was taught to us during that whole time.

At FPS, I learned that teachers were free to form their own views about attendance because the head teacher only gave them warnings if they did not attend or were late;

teachers were not penalized for failure to adhere to their given schedules. In my talks with the FPS head teacher, Gipsam Mlay, he acknowledged that teachers at his school were not able to fulfill their regular classroom teaching responsibilities:

Teachers [here at FPS] cannot teach all the lessons required of them. [At FPS] there are eight periods in the day and teachers have to teach six or seven of these. And for each class they have to correct student work. It is not possible for teachers to grade all of this work. I get very tired if I teach six periods. I can teach three or four periods and maintain my intelligence, but I miss teaching two subjects. If I do this, I have time to teach my classes well and am able to prepare well other lessons that I teach. Some teachers here also hate what they teach. They are chosen to teach specific subjects, and we must choose their subjects for them because we do not have enough teachers.

Gipsam Mlay added that he could not hold teachers accountable for their inability to adhere to their schedule. This was because he risked losing his teachers:

I do not punish teachers here when they are not teaching because if a teacher [at FPS] leaves, then the district will not send us another teacher to replace them.

At NPS I observed that teachers were subject to stricter norms than at FPS. For example, NPS teachers were less free to be truant because their head teacher was able to have them replaced upon consultation with the district, as indicated by the following statement from Valerian Mbise, the NPS head teacher:

Teachers [at NPS] have a responsibility to be in the classroom. The only reasons they can leave are if they are sick—and they can't be sick more than two days in a row—or if they have office work. If they need to leave the class because they

have a responsibility and are going to have students teach the class, they need to get permission from me.

This policy was able to be enforced at NPS because (a) there was a teacher attendance sheet kept by students in each class which teachers needed to sign when they taught a particular class and (b) Valerian Mbise would write letters to the Moshi District education officer asking for non-compliant teachers to be removed from his school. In an informal discussion, I was told by Valerian Mbise that NPS teachers were given two warnings and the third infraction would result in their removal.

Overall, parents at both schools expressed that they felt that teachers at their children's school were fulfilling their job responsibilities more than adequately. They felt that it was not a problem when they were unable to follow their teaching schedules because of additional work and home responsibilities that they needed to fulfill.

Classroom Expectations and Practice

Giving orders. In both school sites I found that students were expected to remain quiet and follow orders given by their teachers. For example, I observed that the nature of teacher-student interaction at NPS in the classroom was for teachers to assign students work to carry out by giving them orders. Also, the teachers' approach to school farm activities was the same as in the classroom at both NPS and FPS: the teacher gave students orders for work to carry out and then authoritatively supervised over them by watching without engaging in the work themselves. In school farm activities, NPS students were also expected to carry out work quietly and adhere to orders given by teachers or risk punishment, as illustrated by what I observed in the following instance:

At lunch break I found Mary Jesta Urasa again in front of the rows of students in the back lot. She came out with a scowl on her face and grabbed a large branch off the ground with one end that hooks out. She began the process of delegating work responsibilities to each group. Occasionally she shook the thick trunk of the branch that was in her hand. “Year III, three students step up!” Urasa uses the hook of her stick to grab those three and uses it to push the others back. “Go clean the shrubs at the side of the school! Go! Move!”

“Year III, five more!” Five students slowly come up. “Go mop the floor of the year III classroom! Run! No talking! Go do your work now! Year IV boys, step up! Go dig sand into a pile in the field in front of the construction site!”

There were three more rows remaining. She addressed all of them. “Now you will come up in groups of ten. Begin!”

Urasa pointed with her stick to the first group. In comparison to the day before, the students moved quickly up in groups of ten. She pointed to the year VI students, who were student leaders. They were standing at the side. “Now get a piece of paper and write the numbers of the students in your group. They must bring three piles of grass each from the cornfields for the cows. Go! Now! There will be no talking!”

As we walked away from the rows of remaining students, I looked behind me and observed Urasa raising the large branch with the hook in her hand and hitting the back of a year IV boy student. As he was hit with the branch he grimaced, his eyes widening so that the whites were significantly more exposed, and his pain was very obvious.

At NPS, the teachers involved with the agricultural duties were found in the fields with their students during the majority of the farm work, and this example demonstrates the typical nature of teacher and student interaction at NPS during those times. Teachers at FPS generally remained in the teachers' office for reasons such as preparing lessons and grading student work during farm activities. However, I did observe FPS teachers facilitating school garden activities by giving students orders when they accompanied their students to the field.

Pulling students out of class. At both schools, I also observed that students could be pulled from class when they were given orders to carry out for other duties aside from their schoolwork. Reasons I found for students being pulled from class were to prepare school lunch, to buy groceries for school lunch or for teachers, or to retrieve items from a teacher's house. At FPS, this occurred daily, and year VI girls were ordered to help to prepare the school lunch as the following example from my notes illustrates:

One of the girls from year VI named Loveness G. Makundi Irene with her assistant Irene Ngowo, who was a girl from year III, had been pulled from class. They were the cooks for the day and were unsupervised in the kitchen with an open fire in front of them. Each day I observed that the student helpers who have been selected and who have been pulled out of class to work in the kitchen are always girls. They leave their classrooms in order to help the male chef.

Despite parents at FPS commonly opposing this practice of pulling students out of classroom time to fulfill work duties around the school, there was no indication of action on the part of parents to prevent these teacher practices from being executed.

Turning over instruction to student monitors. Although I observed that classrooms of students at FPS were commonly left alone by teachers, FPS students reported during interviews that supervision of classrooms was handed over to student monitors when the teacher was not present. Their job was to write names of students who interrupted, and they gave students warnings if they were talking. If a student was reported to their teacher this student got spanked three times or needed to mop the latrines, sweep the classes, or carry water.

Although I did not observe such a system being implemented at FPS during the time I spent conducting research there, at NPS, I observed that turning over instruction was a common strategy used by teachers there:

After the boy student leader, Hoprey Lenai Ngomud, finished writing his notes on the board, he then handed back results from this month's history exams. At the end of each month, the students at Nyota Primary School were given exams... Since a teacher was not present in the room to review the correct answers, the students stood up and went to look at the exams of other students so that they could learn what the correct answers were. [The year VI girl student leader] Irene Pendaely continued to write the names down of the students who were talking.

Another example of NPS teachers turning instruction over to students was in the classroom of the veteran male teacher, Fuatael Mlay. Teacher Mlay had student leaders copy notes on the board, and then the rest of the students copied the notes in their notebooks and answered the questions that were given to them. The following excerpt is from an interview with Teacher L, explaining why this method of instruction was commonly used at NPS:

Some students are more advanced and can teach the other students. If we do not have students supervise classes, then many students will disturb the others.

Teachers have responsibilities that they need to take care of, like teachers' meetings. All of us are required to be there. Teachers also have problems. They need to take care of these problems. Like they need to go to Moshi to collect their salary. When there is a wake in the community, teachers need to attend it and also need to prepare gifts such as firewood or grass for their cattle.

I learned that a major reason for why teachers chose to turn over instruction to students at NPS was because NPS head teacher, Valerian Mbise, supported his teachers in doing so, as indicated by this quote:

Having students teach is a great benefit because we use the time well for student learning when the teacher cannot be in the classroom. The more advanced students can lead the other kids. There is no weakness in doing this. The teacher returns to supervise the students.

When prompting students for their views about the nature of instruction at their school, the majority expressed that they preferred when their instructor was present in their classroom teaching them. However, a minority of students stated that they preferred the learning environment while student monitors supervised class because they were able to ask questions, as indicated by this quote from a female 4-H student at NPS from a typical household, Loveness G. Makundi:

When the teacher is not there, students are not afraid to ask questions. The student who is put in charge of teaching the class answers any of the students'

questions that they might have. When the teacher is present, many students do not ask questions because they are fearful of the teacher.

Discouragement of student questioning. At both schools I found that there was little opportunity for students to ask questions to teachers, either about the work they were ordered to carry out or the educational content they were being taught in the classroom or on the farm. Students at both schools reported to me that they did not ask questions because they were not encouraged to do so. One reason for why students were quietly expected to carry out instructions given by teachers was because many of these students were generally not permitted to speak to adults in their home either. For example, a year VII female 4-H student from a typical household explained:

At home many [NPS] students are not allowed to talk to their parents. I am not allowed to talk when I am eating dinner until I am finished. Many of the students are not used to speaking in front of adults.

Since the nature of adult and child communication was reported in both communities as being adult-centered with children acting as passive recipients, this likely influenced the methodology that teachers at FPS and NPS chose to adhere to when they communicated with their students.

The Nature of Pedagogy

Chalk and talk. During my classroom observations, I found that teachers generally relied on chalk and talk methods of instruction. Chalk and talk methods at NPS and FPS included the following:

- (1) teachers copied notes from their textbooks to be written on the board—at NPS, the teachers often had students write their notes on the board for them;

- (2) students copied these notes down into their notebooks;
- (3) teachers included written, fill-in-the-blank questions in their notes;
- (4) teachers gave small lectures at the end of the class about the information covered in the notes, where they tell the students the answers to write in the blanks;
- (5) the students filled in the blanks while the teacher generally left the classroom;
- (6) the teacher returned and either collected or immediately graded the student work.

During classroom activities, I observed that chalk and talk procedures were consistently relied on by teachers at both schools. Mainly, this instruction involved lecturing to students and then giving them orders for desk work to do in their notebooks, which they were expected to quietly carry out.

However, I observed exceptions when other teaching procedures were used. In English class for year V at NPS, for example, teacher Angela Phelisian wrote English words on the board and had students repeatedly shout out the words. The next week, she had individuals read passages from books that groups of students shared. In science class, an NPS veteran male, John Urio had students walk around and show models of the organs of a human body to students and have them identify the parts.

While teachers at both schools mainly gave students orders to carry out when working in the garden, teachers at both schools recognized the effectiveness of the “*shamba la darasa*” (farm field classroom) as an effective tool for students to learn practical agricultural skills. One reason that veteran teachers regarded giving orders out as being an effective teaching method was because this concept was introduced when they were children during the period of Education for Self-Reliance in Tanzania, which took place in the 1970s and early 80s. Primary students spent a portion of their day

working in the farm fields and approximately two hours a week learning about planting types and techniques because the teaching of agricultural science was compulsory (Semali & Stambach, 1997).

Classroom learning of agriculture skills at both schools was facilitated through the school subject studies of work. At FPS this class period was consistently skipped, but at NPS, students wrote notes on the board about (a) how to raise chickens, (b) the different types of fertilizers and pesticides, and (c) methods for growing corn. Chalk and talk procedures were predominately followed during these lessons, but I observed that NPS students were occasionally brought out to be shown examples around the school:

The male teacher of “Studies of Work”, Fuatael Mlay, has year V students visit the school’s henhouse. Systematically he asks small groups of students to step up and asks each of them if they see the chickens’ water, food, if the cage is clean, and if they notice manure below it that can be used in their garden. After asking these questions to three groups the teacher then has a year V boy leader from class ask these same questions to the remaining groups. Students then return and boy student leaders write notes on the board from the teacher’s manual that the class must copy.

Aside from this example, I observed the male teachers at NPS generally had students copy notes from their textbook up at the board. I observed two of the veteran female teachers involving their students to some extent in their learning by having them read aloud and by occasionally asking them simple questions, as illustrated by the following example:

During a Swahili lesson given by teacher Mary Jesta Urasa, groups of five to seven students were gathered in groups and were bunched around a reading passage in one book. I wondered how many of the students who were reading upside down could manage to comprehend any of the text, if at all. Teacher Urasa selected students from different groups to read aloud. When a student did not read a word correctly, Urasa shouted the corrected word out. She did not give the student time to correct her/himself and merely had the student carry on reading the passage. I wondered how many of the words the students were able to understand in the text. During the entire time of reading aloud, Urasa did not stop to ask certain students to give summaries of what they learned, or to write about what happened in their own words, or have students write new vocabulary words. At the end of the reading passage, Urasa read the questions aloud from the textbook and called on students. The questions were short answer and the students she called upon stood up and gave short one-word responses. After this was finished, Urasa sent the students to their seats to write the answers to the exercise in their notebooks.

As this example illustrates, I observed that teachers at NPS did also use other instructional methods than rote instruction pedagogy. Be this as it may, in my observations, I noticed that teachers only permitted students to speak using scripted responses; they did not incorporate open-answered questions or opportunities for students to guide their own learning in small groups.

Punishment

While both schools mentioned the use of corporal punishment, there were consistent norms at NPS regarding the punishment of off-task students, while at FPS there were not. NPS students who were off-task were reported to their teachers and were punished. The following is an example from the week of the corn harvest, which illustrates how student leaders were placed in charge of supervising students and would give the names of misbehaving names of students to the teacher in charge:

The boy student leader Jesse Martin Bush stood up on the pile of corn and pointed a stick at the girl students in the back. “Do your work! Move apart!”

For quite a while, no teacher entered the room, and Jesse continued to monitor our progress from his perch on the middle stack of the corn classroom. Occasionally he gave orders to students, which consisted of him shouting at a high decibel, saying “Do your work!” or “Move out of that spot now!”

Then later Teacher Mary Jesta Urasa came in and began supervising the students in the main corn classroom where I now sat. “All of you in the back!” she shouted to the boys that were working in the corner. “You are not doing any work. Come here in front and do your work!” The boys stood up and hurriedly rushed to the space that teacher Urasa pointed to. Teacher Urasa scooped up some corn and handed it to them. She remained standing and watched the work progress of the students in the classroom.

When students were punished, it was up to the teacher how many lashes they decided to give out. Despite being ordered to stop corporal punishment practices in Kilimanjaro

Region, NPS parents spoken to for this study all supported the use of caning and so did their chairperson, John A. Nnko, as this statement from him indicates:

Corporal punishment is used [at NPS] because discipline is needed. If you give a kid freedom, he will take advantage of it. Students in other schools are very noisy. Punishment is necessary for children to behave in class. Hitting may not be the best for students, maybe digging a hole is better. The United Nations and NGOs in Kilimanjaro were talking about children's rights all the time, and we even stopped using corporal punishment for a time. Then students started misbehaving. So we started using corporal punishment again. Students nowadays need discipline because there are lots of drugs available and there are many ways for kids to get in trouble.

A major reason reported for parental support of corporal punishment was because the NPS head teacher had been working at their school since 1998 and had gained the trust of the community.

Students at NPS helped teachers administer punishments by monitoring student behavior. Student leaders from year VI were selected and their role during school hours was commonly to supervise student work in classrooms and school farm activities. Non-compliant students had their names written down and faced being caned by teachers.

Although it was reported by FPS students that they were occasionally caned by teachers, I never observed this during my time there. One effect I observed from this lack of caning was that in garden work FPS students often did not exert effort. For example, there was one time I went to work with the large group of boys who were weeding in the garden. As usual, many of them were staring around the field more than they actually

worked in the garden. There were quite a lot of rows that needed to be weeded and not a lot of progress had been made.

Teachers at NPS had a certain amount of control that they could exercise in punishing students. However, at FPS there was a lack of consistent norms for punishing students. Many behaviors that would have been punished at NPS went unpunished at FPS. A reason given by FPS teachers for the lack of strict punishment procedures at FPS was that they did not have the full support of parents. FPS teachers reported that farm work at home was commonly prioritized more than school subject study by FPS parents and that FPS students often missed school in order to do farm work at home. As a likely consequence of the lack of parental support, FPS teachers had to tread carefully and make sure that they were not turned out of the community because of their choices in the classroom. This concern was likely valid because there was evidence of head teachers running into problems at other schools in Mchanga due to parental opposition, as explained by the Oikos school garden coordinator, Claudia:

[In another primary school in Mchanga] the head mistress said that she was from a different ethnic group and if she goes out and complains about students not doing [what they're supposed to] then the community throws stones at her. She told us at Oikos, "Please stop your activities in this school because I cannot keep going, I cannot keep the [school garden] project going, I cannot do it."

One consequence of the lack of community support for the teachers was that FPS students who were non-compliant in school subject study or farm work were yelled at instead of being caned. The behavior of teachers at FPS was to occasionally monitor

student work by overseeing it from the peripheral while avoiding the use of traditional methods of discipline, like caning FPS students.

Although there has been a lot of discussion about what goes on in state schools in sub-Saharan Africa, the literature assumes that teachers do what tradition demands regardless of parental opinion (Mncube, 2009). The example from FPS above suggests that teachers there are sensitive to the views of parents in their community and make decisions that are risk-averse.

Community Support for Schooling and Respect for School Resources

In my research at both sites, I found that community support for educational projects was a major factor contributing to school improvement in some communities. However, I found major differences between each site. In the Kilimanjaro region, where NPS is situated, there is a history of community contribution for schooling. Under British rule before independence, for example, schooling systems there were developed through the participation of communities:

Through the British system of indirect rule, people on the mountain developed an extensive school system funded through taxes collected from coffee revenues, and they established cooperative societies that provided farmers with fertilizers and farming tips and connected the region to international markets. Schools and cooperatives, as well as private businesses, were all brought under government control by the early 1970s, and the limited autonomy people had in governing themselves locally during the colonial era was brought to an end shortly after independence, in 1961 (Stambach, 2000).

Despite schools being brought under government control after independence, the former NPS chairperson told me how there was a history of the community in Nyota helping with the construction of NPS.⁴²

In the Fadhili community, the FPS head teacher expressed frustration because of the lack of willingness of the community to contribute funds for school construction and other projects. During my time spent conducting research at FPS, the construction of two new classrooms had been initiated on the side of the front yard of the school. Later when I revisited the community, I noticed that the construction had been halted. I was informed by the FPS head teacher, Gipsam Mlay, that this was because schooling was not prioritized by the FPS community:

Some of the [FPS] parents raised money for the construction of these buildings but not all. The parents here are not concerned with raising revenues for the construction of additional classrooms at the school. But over there next door there is a Lutheran church. The community built this entirely with their own money and hands. But they are not helping to build the classrooms at Fadhili, even though Oikos is going to match the funds that were raised by the community.

These examples illustrate how there was variation across the two communities in regard to their support for schooling and that there are differences in the degree of importance assigned to schooling between even the two communities in this study.

In addition, I observed that a major factor that influenced sustainability of educational materials invested by the TMEVT, the community, or outside NGOs was the

⁴² See “Description of NPS facilities” in above section for further reference.

amount of respect for school resources in a given community. I observed both of the communities to have different norms about care for school resources. In addition to NPS teachers using student leaders who supervised student behavior and reported off-task students, there was effort by teachers to use available teaching materials in their teaching, and students were expected to help out and care for their materials as the following field notes illustrate:

In his lesson the male NPS science teacher, Fuatael Mlay, carefully takes out large poster boards of the parts of the female and male genitals from the plastic they are wrapped in and shows them to the students. He candidly explains the structures such as the fallopian tubes, ovaries, testicles, and so forth.

Remarkably, he carefully holds each picture in front of the students so that all can see. I am very surprised to observe that he is doing this, for I have observed few teachers in rural Tanzania who are aware of the need to show materials so that all students can see them.

After going through the different parts of the genitals for the male and female by carefully holding each picture in front of the students so that all can see, the teacher takes out two large plastic models of a woman and a man. The teacher first carefully takes off a plastic wrapping that is covering these shapes. When he is done talking about these shapes he has a few students delicately cover them again with the plastic and tie string around them.

In a similar vein, I also observed that there were systems in place for punishing students who did not care for materials at NPS. At FPS, on the other hand, teachers often remained in their teachers' office away from students and did not make an effort to use

available resources in their classrooms. Thus, many of their materials collected dust in the teachers' office, such as the science tool kits distributed by TMEVT and student textbooks provided by Oikos as the following example illustrates:

For about an hour in the late morning the teachers at FPS came over to the desk where I was sitting in order to poke at the items in the science kits. The students remained sitting in the classrooms. The teachers told me that the TMEVT had delivered these science kits to them but had not provided any training. They were still waiting for training and did not know what to do with any of the items that were in the science kit. When the teachers were finished looking I placed the items back inside the box. Teacher Emanuel Stanly Urrio returned the boxes to their place at the bottom of the shelving unit with three other smaller boxes stacked on top. There the boxes would continue to collect dust. FPS had access to these resources, but due to a lack of training, they said that they were not able to utilize these kits in their classroom, preventing the students from benefiting from a less traditional method of instruction.

Still, even when teachers understood the intended use of classroom materials, I did not observe these materials being treated with care at FPS. Despite only being used sporadically, the students' textbooks were torn and dilapidated from student use. Aside from the following quote from an adult villager, who suggested that teachers at FPS did not have sufficient experience working with the materials, I did not observe an emphasis on the need to care for materials at FPS:

The teachers need training in how to use the materials for each subject so as to direct students in doing activities. This is the best way for students to learn: by

applying their learning and being active. Teachers at FPS do not know how to use the materials at their school. The TMEVT has not provided them with training to lead students in doing activities.

Despite teacher adherence to using rote instruction methods, a few parents at both schools recognized the benefits of applying active instruction methods and valued the resources' potential as educational materials. They felt that students being empowered to participate in the activities would be beneficial for student learning

In contrast, when I asked the NPS chairperson, Jesse Martin Nnkini, about his view of the standard chalk and talk procedures used in Tanzanian primary schools, which I had observed being used at NPS, it was his view that alternative methods were more effective:

Teachers did this when I was a child, too, and I copied what they wrote. I think that when students memorize they do not learn as much. When teachers have students debate and discuss the concepts learned students learn much better.

At FPS, Jacob E. Mmbando, a parent who was an educated Lutheran pastor felt strongly that students are taught best in science when “the teacher asks the students questions, writes on the board the information, lectures students about this information, corrects student work, and is not absent. It is better for students to do activities. They learn better if they use their feet, eyes, hands, and mind.” He added that teachers were not receiving adequate instruction about how to use the given resources available to them

The lack of teacher knowledge reported by teachers at FPS about how to use the resources provided in order to teach basic lessons in science could be addressed by providing them with basic training about how to independently use the given materials

and the textbooks provided to them by the TMEVT. For example, I flipped through the year IV, V, and VI science books and found that many of the science lessons in the books were self-explanatory if one studied the lessons in detail and then experimented in the teachers' office with the items before teaching the class. For example, working alongside teacher Emanuel Stanley Urío at NPS, we looked at the year V science textbooks that Oikos had purchased for the school. I was able to connect the light bulb, turn the light on and then cut a hole out of a piece of paper and shine the light through the glass prism, which resulted in the colors of the visible spectrum of light (red, orange, yellow, green, blue, indigo, and violet) to be cast out onto the wall.

Conclusion

This chapter began with a survey of 16 schools with cultivation programs, which served as a window to identify diversity and commonalities across state primary schools in Tanzania in the types of approaches used in these schools. Further research conducted at FPS and NPS school sites offered a narrower look at the educational services provided to Tanzanian children and the nature of involvement of students and parents in classroom learning and farm activities at their school.

Common teaching practices at each school were discussed at the end of this chapter in order to identify some of the ways in which teacher and student time is allocated. According to villagers, some of these practices may increase opportunities for students to learn, while others do not. The quotes from a minority of villagers in each community reveal that they are critical of some methods adhered to by teachers in these schools and in other Tanzanian state schools. This includes practices where interaction with students is frequently very limited and teachers are commonly absent from classes. Other examples include adherence to using a chalk and talk pedagogy, order giving in classroom and farm activities, and teacher attendance practices. This chapter identified some differences between the schools' teachers' practices in order to understand the general views of teachers, students, and parents about classroom practice and student experience. In subsequent chapters, the diversity of different views amongst these stakeholders about these issues will be analyzed in greater detail.

APPENDIX

APPENDIX A

A Summary of the Ratings that Schools Received in Relation to the “*Criteria for a Successful School Farm Program*”

- **Empowerment of students:**

- *Students are empowered to be actively involved in the upkeep of the garden on a consistent weekly basis (1/4 average)*—All school cultivation programs that were non-supported by donors received lower scores, 1 out of 4 on average, because students were reported to receive minimal instruction to carry out garden work a few times each year. Exceptions were the six 4-H school garden clubs, which received scores of 4/4 because students were reported to actively participate on garden activities on a consistent weekly basis and also in the 4-H club governance.
- *Students are empowered to be involved in the organization and planning of the garden on a consistent weekly basis (1/4 average)*—Same reasons as above.

- **Garden activities are talked about as being connected to student learning academically:**

- *Directly tied to learning of science curriculum (1/4 average)*—Schools all received this average score because their teachers stated that there was no connection of student farm work to the national curriculum aside from the topic of the plant life cycle and the elements needed for plant growth (sunlight, soil, water).
- *Directly tied to learning of math curriculum (0/4 average)*—Schools received this score on average because there was no relationship reported between the math curriculum and student farm activities. The one

exception was that in two schools—Anga Primary School in Mchanga village, Arusha Region and Jiwe Primary School in Ekundu River, Arusha Region—the teachers stated that their students learned the concept of measurement on the national curriculum in math by using sticks and string to measure the distance between the planting of certain seeds such as corn.

- *Directly tied to learning of other academic curricula* (1/4 average) — Schools received this score on average because teachers reported that farm work activities were infrequently connected to the studies of work national curriculum, which has certain chapters devoted to agriculture and raising livestock. Teachers did not state how they applied the national curriculum of studies of work aside from lecture-based methods in class. I did not find the farm projects to be used as learning laboratories in which to apply and learn about certain concepts from studies of work or other school subjects at any of the schools I visited.

- **Garden activities are talked about as being connected to non-academic student learning:**

- *Encourages work ethic* (1/4 average)—Schools received this score in general because students were given orders to carry out work a few times each year. An exception was the 4-H clubs, which received scores of 4/4 on average because students were empowered to take positions of leadership in club meetings, group work, and maintenance of records. However, I would learn later that many of these 4-H clubs were no longer

being supported by 4-H and therefore the teachers were just using the students in the 4-H club as laborers in school farming activities.

- *Improves self-esteem* (2/4 average)—For school farm programs, scores in general were only 2 out of 4 because students were given orders that they were expected to follow and were not permitted to take positions of leadership or keep records of the selling of the crops. Exceptions were the six 4-H clubs which received scores of 3 out of 4 because the students were reported to be directly involved in the governance of the club and its management.
- *Provides positive opportunities for social networking* (1/4 average)—All primary schools received a score of at least 1 out of 4 because in each program there were opportunities for students to have informal conversations with their peers. However, these situations were limited and students were expected to carry out instructions quietly. One exception was the 4-H clubs, which received higher scores of 3 out of 4 because students were involved in managing the clubs and working together in groups collectively to raise revenue and decide how to use profits, etc.
- *Teaches students valuable skills that are perceived to improve their livelihoods and that of their families* (2/4 average)—Schools were given this score on average because students learned how to carry out methods for growing only a few select crops. This is because, in general, the school farms were monocultures, since bananas, corn, or beans were mainly grown. Therefore, the students did not learn how to plant more

than a few varieties of crops. Exceptions were the two schools that experimented with drought-resistant varieties, and these schools received scores of 4/4. These schools were Ukame Primary School below Arusha town, which grew cassava and potatoes last year, and Fadhili Primary School, which grew peanuts.

- **The program is sustainable:**

- *Garden input fees paid for with garden output (4/4 average)*—All schools received high scores in general under this category because they were able to pay for their garden fees with the selling of corn. Exceptions were the two primary schools located in the drier Maasai area of Arusha town below the city centre which received scores of 1 out of 4. They were not able to harvest their corn because they did not receive sufficient water for irrigation from their ward government.
- *The funding for this program is not dependent on student fees for its upkeep (3/4 average)*—Primary schools received this score on average because students only needed to contribute manure and bring water in their two liter containers and because all students were required to contribute corn and beans for the school lunch each semester. Exceptions were 4-H-supported schools, which received scores of 2 out of 4 on average because parents were also encouraged to purchase harvested vegetables.

- **Garden produce is used as a significant portion of food used to cook school lunches:**

- *Garden produce improves hunger issues for students (2/4 average)*—Schools received this score on average because a portion of garden produce was reported to be used to feed students in all schools. In all cases, this was reported as not being enough to feed all of the students at the school. Exceptions were two schools—Nyevu Primary School in Ekundu River and Juu Primary School in Baridi village—where the harvested crops were used to help provide food for disadvantaged students at their school such as orphans and students with HIV/AIDS. At schools supported by the Italian-based NGO, Oikos, the harvested crops were used only for supplementing the school lunch program, but not enough was produced to improve student nutrition (Oikos Food Facility Project Manager, 2011). The six 4-H schools received a lower score of 1 out of 4 on average because they did not use the produce for school feeding because the students sold the vegetables.
- *Garden produce used in school lunches increases attendance of students (1/4 approximately)*—Garden produce in school lunches was not claimed to have increased student attendance. Two exceptions were the 4-H-supported Nyota Primary School in Nyota village, Kilimanjaro Region and the Oikos-supported Fadhili Primary School in Mchanga village, Arusha Region. These two primary schools received scores of 3 out of 4.
- **Garden produce is used to earn funds for students and for school fees:**
 - *The selling of garden produce is used to significantly reduce costs for students and for other school expenses (2/4 average)*—At each school

teachers and school committee decided how the profit was to be used. The predominant practice was that the farm crops were sold in order to make a profit for the school. The schools received scores of 2 out of 4 on average because, in general, it was reported to be used to purchase school supplies for teachers such as notebooks and pens or for school construction projects. The funds were not used to reduce costs for students, in general, such as through offsetting their school fees. Two exceptions were the two primary schools where the crops were used to provide school lunch for disadvantaged students, Nyevu Primary School in Ekundu River and Juu Primary School in Baridi village.

- *The students are directly in charge of book keeping for the selling of garden produce* (1/4 average)—In general, the students were not permitted to be involved in the selling of garden produce and therefore received a score of 1 out 4 or less. Exceptions were the six 4-H clubs, where the students were directly involved in the selling of produce in order to make a profit.
- *The students are directly involved in determining how the profits from school gardens are used* (1/4 average)—In general, the students were not permitted to decide how the profits generated would be used, and therefore the schools received a score of 1 out of 4 or less on average. Exceptions were three out of six 4-H clubs where students reported that they had been given the option to decide how to use the money. Students in these clubs decided to either use the money to pay for school supplies such as

notebooks and pens, pay for field trips to go to national parks in northern Tanzania, or divided the profits amongst each other. Students in the other 4-H club programs were not given this option,

- *Garden produce or profits from gardens are not appropriated by teachers* (2/4 average)—At 13 out of 16 of the primary schools I did not find direct evidence of the garden produce being appropriated by the teachers. Three exceptions were Kijani Primary School in Ekundu River, Ndogo Primary School in Mchanga, and Ukame Primary School in Arusha town. At each of these schools it was reported by teachers that certain farm fields planted around the school were only used by teachers.

- **Community members actively support the garden program:**

- *Community members consistently offer support for the program (labor, sharing expertise, or cost-sharing)* (0/4 on average)—Schools received a score of 0 out of 4 in general because community members were not involved in supporting the program aside from contributing manure. Exceptions were the three Oikos-supported primary schools in Mchanga village, which received scores of 3 out of 4 because women in the community started their own gardens on land allocated to them by the school, which they sold and divided the profits amongst each other.
- *Community members directly learn from the garden* (0/4 average)—No direct evidence was found that community members were directly learning from the school garden spaces at any of the 16 primary schools. Exceptions were the 3 Oikos-supported schools in Mchanga, where an aim

of these programs was reported as being to disseminate agricultural knowledge to the communities and the six 4-H-supported programs because students were reported to be initiating their own projects independently at home. But even at the Oikos- and 4-H-supported schools I did not find direct evidence of knowledge being diffused to communities.

- *Community members with agricultural expertise help to advise those involved with the school garden and especially the teacher in the leadership position for overseeing the garden (0/4 average)*—No evidence of qualified farmers serving as advisors was found at any of the school sites I visited.

- **Teachers are responsibly using the garden:**

- *Garden activities are not used as punishment (1/4 average)*—It was a common practice at all primary schools that garden activities were used as punishment. Exceptions were the six 4-H-supported primary schools where students were involved in independent projects in the garden and were doing this work on a voluntary basis.
- *Teachers at the school are running the garden program effectively (2/4 average)*—In general, the teachers at each school were running the school garden programs effectively. A major reason for this was because the teacher agricultural coordinators at each school had decades of experience farming their own fields and also in facilitating farms at other state schools in Tanzania. But, aside from the 4-H school garden clubs and Oikos-supported schools, I found that they were applying monocultural

agricultural techniques. At two of the primary schools in Arusha town the crops dried due to the lack of rains during the rainy season and because they had no consistent access to irrigation.

- *Teachers are knowledgeable about how to apply garden learning in their classrooms* (0/4)—Teachers at each school were found to be confident and comfortable in their role as teacher agricultural coordinators at their school. However, I found scant evidence that there was a major emphasis on applying the work in the school cultivation plots in the classroom in conjunction with math, science, English, Swahili, or studies of work.

- **Garden is run efficiently:**

- *Water issues for the school garden are being adequately addressed* (1/4)—School gardens that were addressing water issues adequately were able to carry out their cultivation programs. If water was not obtained on a consistent basis, then the program simply failed. At ten out of the 16 schools, water issues were not being addressed sufficiently because they either did not attain irrigated water from the municipality in sufficient quantity or did not receive adequate water from the piping system.
- *Artificial fertilizers and pesticides used for school garden are not used* (0/4)—In general, schools reported that they used store-bought pesticides but that students contributed manure from their households for school farm activities. Exceptions were the Oikos-supported school garden programs, which were all required to grow gardens organically and the 4-H club at Fadhili Primary School in Nyota village, Kilimanjaro Region

where the focus was on organic farming. These schools received scores of 4/4.

- *High quality crops at school are grown successfully* (1/4)—At schools that obtained available water through irrigation, they were able to grow crops successfully and received higher scores of 3/4. These schools were comprised of two 4-H school club programs in Arusha town, one primary school in Ekundu River, and three Oikos-supported schools in Mchanga village. At the ten other schools which did not have available water, they were not able to crops very well because of the short rainy season last year and therefore scored only 1 out of 4 on average.
- *A variety of different produce is being grown successfully* (1/4)—At most schools, only a few crops were being grown, such as corn, beans, or bananas. They therefore received scores of 1 out of 4 due to the limited variety of crops being planted. A diverse variety of crops was found to be grown only at select schools such as three 4-H school garden programs (Ulimwengu Primary School and Nyoka Primary School in Arusha town and Fadhili Primary School in Nyota village, Kilimanjaro Region) and two Oikos-supported programs in Mchanga village (Anga Primary School and Fadhili Primary School).

Conclusion of Appendix A

Using my “Criteria for a Successful School Farm Program” I rated all of the cultivation programs at these 16 schools. 14 out of the 16 primary schools received scores of 45% or lower and were not selected as sites for this study. This was because I

felt that I would not be able to richly compare the teaching and learning that was occurring in their school farm programs. The reasons for this were because of the following:

- *Limited involvement of students*—Students were generally not actively involved in any leadership capacity such as accounting or determining what crops to be grown and what activities to be carried out within the gardens on a weekly basis but rather adhered to orders given by teachers;
- *Garden work not tied to school subject study*—Cultivation activities were only tied loosely to the national curriculum in science, math, and other subjects;
- *Limited opportunities for non-academic learning*—With the exception of 4-H school garden clubs, cultivation activities were generally not tied to promoting non-academic development of students such as self esteem, social networking, or a work ethic, nor was there any emphasis on diffusion to households;
- *Harvested crops not used in cooking school lunch for students*—I did not find evidence that the harvested crops were used to cook the lunch for students on a regular basis; and
- *No involvement of community members in garden/farm work*—Aside from community members involved on the school agriculture committees, I also did not find that community members were actively involved in providing or receiving knowledge about the agricultural activities being carried out.

Overall, with the exception of only a few cases with regard to the 4-H school garden programs in Arusha town and Oikos-supported schools in Mchanga village, I observed that the cultivation programs I visited were faced with numerous obstacles due to water

constraints, misappropriation of crops and/or revenues by teachers, and lack of experimentation with different crop varieties. I did not find evidence that the school gardens/farms were centers for improving students and community learning or addressing issues of food security. I was unable to explore the nature of classroom learning in more detail at these preliminary school site visits because of the limited time I had for each of these visits.

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CHAPTER 5

Conflicting Expectations for the Role of Schooling at FPS and NPS

The preceding chapter demonstrated how teachers were not committed to following their regular teaching schedule because there was an accepted culture of teacher absenteeism from classroom teaching responsibilities. Aside from the exceptions of a few teachers at each school, the teaching pedagogy at each school was rooted in the practice of giving orders to students, and it was acceptable for teachers to pull students out of class to execute chores around the school. It was shown that systems of negative reinforcement were prioritized for punishing students at both schools, while there was no evidence of the use of systems of positive reinforcement. What we learned from the views of teachers, students, and parents about these schooling practices was that these teacher behaviors are an accepted part of Tanzanian state schooling that, in general, are not questioned.

These findings were in line with the expectations created by the literature, where it was indicated that the traditional method of instruction in Tanzanian schools was giving rote instruction where students were given instructions to carry out (Stambach, 2000). Also, sub-Saharan African school cultivation programs have traditionally been focused on production, where the role of students was as laborers. However, the two school sites for this research were found to be different from other state primary schools that I visited. The instruction of teachers at both schools, NPS and FPS, was concentrated not only on the preparation of students for national exams but also on executing effective school lunch programs and farm activities where students were

actively involved in the upkeep. The teachers at both schools were regarded by the village populace as being more motivated than teachers at other schools because they were actively involved in facilitating school farm activities, they collected the fees that students must pay for their schooling and lunch, and taught additional courses on the weekends. For example, at FPS, teachers taught courses on Saturdays during the months of May to September and did so pro bono. At NPS teachers taught on Saturdays throughout the entire academic year, although students were charged a fee of 200 shillings (\$.13 USD approx) in order to attend. The teachers at these two schools differed from the teachers represented by the literature on school cultivation in sub-Saharan Africa, where teachers have been found to have low motivation for additional tasks that they are not paid to do (Riedmiller, 2002).

Meaning and Importance of Expectations

The focus of this chapter is on the expectations about what schools and their staff are supposed to do and what students should learn in school. Identifying expectations is central to this chapter because this shows the multiple areas in which schools and their staff are viewed as needing to direct their attention and time. The terms “goals” or “purposes” are not used because many areas in which schools and teachers are thought as needing to carry out work responsibilities are not written as specific policies to be followed or attained by the TMEVT. Therefore, the term “expectations” is more suitable because it identifies other areas where significant portions of teacher time are designated, many of which have not been formalized.

Since defining success in classroom practice is highly complex, when expectations are identified in this chapter, they are not the same as evaluating school

performance in terms of meaningful academic learning. There may be differences in views amongst particular stakeholders in defining a successful school and whether meaningful academic learning is even seen as a prioritized component of school success. Therefore, different interpretations of expectations for how a school should function will be identified whenever possible in order to understand what is meaningful to the villagers, teachers, and their children in the community.

In this chapter I argue that while some expectations support each other within Tanzanian primary schools, various expectations play out against each other. Furthermore, there is diversity across schools and communities in how students, parents and teachers think about these different expectations. Often these views may stand in opposition or support one another and may favor or act against promoting student learning in the sense it is understood by most education scholars.

An Overture to the Different Expectations for NPS and FPS

During my research conducted in the FPS and NPS school sites, it became clear that teaching practices cannot be monitored within primary and secondary schools in many wards and districts throughout Tanzania because of limited funding provided to education officers and inspectors by the TMEVT for transport expenses. During an informal interview with the educational officer in Mchanga ward, Arusha Region, the officer explained how school visits were logistically difficult:

In order for me to visit primary schools in Mchanga, I must visit schools through traveling on my motorcycle. There are no funds available for that from the government, so I must pay for gas. I have a family and am paid a very low salary. How can I expected to pay for this gas if my family cannot eat?

A school inspector in Lindi Region in southern Tanzania shared a similar observation, demonstrating that the funding difficulties were not an isolated issue:

There is no monitoring of teachers by inspectors [here in Lindi district]. We cannot visit primary and secondary schools because we do not have funds for gas. Their feedback suggests that monitoring school performance through school visits is not being prioritized or supported financially by the TMEVT. As a result of this lack of direct observation, I found that the administration of national exams is *the* main method the TMEVT relies on to evaluate teaching and learning in Tanzanian primary schools. Although funding isn't provided for school visits, the TMEVT does attempt to evaluate student and teacher performance through these national exams.

From interviews with teachers, students, and parents at both school sites and my observations of the delivery of classroom lessons and participation in school activities, I learned that expectations centering on improving educational quality and student learning in the villages where I conducted my research were rooted in the ability of students to gain sufficient skill proficiency in order to pass national exams. Aside from this priority, expectations also focused on the need for teachers to enforce school rules and procedures and, when possible, to increase the school's resources. Other subsidiary aims of schooling that I identified through my conversations were (a) that students would gain income-generation skills applicable in their future, (b) that schooling would lead students to develop stronger work ethics, and (c) that schools' communities should give teachers support and avoid criticism.

First expectation: To pass national exams. The most intense pressure for student learning in Tanzanian primary schools is attached to student performance on

national exams. The following passage is taken from my field notes from a teacher training for rural state primary schools in a rural village in southern Tanzania:

During this day Cynthia worked with the teachers on identifying the different goals of education for the nation, national curriculum, and their classroom.

Cynthia asked the teachers what the goal of education is in Tanzania. “It is to pass national exams,” one of the veteran teachers responded. The 24 other teachers present unanimously agreed.

This quote demonstrates that the predominant view of all teachers at the training is that the major goal for student learning in Tanzanian primary schools is to prepare students to pass national exams in their year IV and VII. Because school visitations by government inspectors are only selectively facilitated due to limited funding for transport, national exams are the single factor used in evaluating the effectiveness of schools and their teachers in Tanzania. If students in year IV and VII of primary school in Tanzania pass national exams, for example, this means that they are required to enter state secondary school. If primary school students in year IV of primary school do not pass the exam, then they are sent back to repeat year IV of schooling all over again. If year VII students do not pass the exam, then they are not permitted to advance to Form I of secondary schooling. In interviews I found that parental support for exam preparation is high because advancement to higher levels of education is thought to enable students to attain positions of employment with higher levels of income.

In interviews in northern Tanzania at the two sites of my research, head teachers at NPS and FPS informed me that, after national exams were taken in September and October, these results were disseminated to district education officers by the TMEVT and

then by the district to the head teachers. Head teachers at schools that underperformed were publicly embarrassed at these meetings and were told to improve their school's passing rate. These head teachers then returned to their school and held a meeting with their teachers. Presumably, at poorly performing schools the teachers were reprimanded and a plan was formed for how to improve the school's exam scores for the next year. The steps of this process were confirmed in my meetings with the ward educational officers in Nyota and Mchanga.

As a likely consequence of the importance placed on students passing national exams, procedures for exam preparation have been established by higher levels of the Tanzanian government (the TMEVT and region, district, and ward leaders). For example, I observed there to be formal procedures for students in years IV and VII to take a series of mock national exams at FPS and NPS. At FPS year IV and VII students were prepared by taking a series of seven exams throughout the academic year:

- Imara district administered their own exam in May.
- Arusha Region administered their own test in June.
- At the school level, the teachers at FPS were required to design their own tests for all of their students. This included a midterm exam in March and August, exams at the end of the first term in June, and exams at the end of the year in November.
- Mchanga ward also administered their own mock exam in May—teachers from each school in the ward were required to help to administer the ward test to the students at other schools within the ward. For example, two teachers at Emmanuel were part of the ward exam committee, and they helped to design and administer the test at other primary schools within the Mchanga ward.

At NPS in Nyota village, similar procedures were followed, except that their exam procedures were more rigorous: students from all years—not just years IV and VII like at FPS—were given monthly examinations, and the results were posted on a bulletin board in the front corridor of the school next to the name of each student. These results could be viewed by students and parents. In addition to taking region, district, and ward exams, occasionally NPS students competed with students from other schools within their ward on mock examinations. Year IV and year VII students at NPS were also given ward, district, and region exams in the months leading up to exam times in September and October.

Figure 3. Monthly Exam Results Posted in the Corridor at NPS.



In addition to preparing year IV and VII students for national exams by administering mock national exams, I also observed that at both schools teachers required students to attend additional courses on weekends in order to prepare year IV and year VII students for national exams. At FPS teachers rotated working on Saturdays from May to September for no additional pay. At NPS teachers worked on Saturdays

throughout the academic year in order to prepare year IV and VII students for national exams. One difference between NPS and FPS was that at NPS all other students—not just year IV and VII—were also required to attend classes on Saturdays; at FPS only year IV and VII students were required to do so and, unlike, NPS, the students were not required to pay each week for this additional instruction.

Some subjects count more than others on national exams. In my research at the two school sites, I found that the exam influenced which curricular subjects were prioritized to be taught by teachers. Some subjects (Swahili, English, science, civics, history, and math) were taught more frequently because they were included on the exams. At each school I observed the tendency for these subjects to be taught before lunch. For example, the subjects of English, math, and Swahili were generally taught in the first three periods of the day while history, science, and civics were taught after morning teatime during the middle of the day.

In contrast, the school subjects of studies of work and *habari za mchezo* (physical education) were included as school subjects during the later periods of the school day. As a likely consequence of the material for these two courses not being included on national exams, I observed that teachers at both schools skipped the teaching of these subjects more than other subjects.⁴³

Teacher absenteeism occurred consistently at both schools, but at NPS, I observed that the first three periods of the day were almost always taught by teachers on days when the NPS head teacher was present. However, in later periods in the day, teachers often were less diligent about following their schedules. Reasons NPS teachers gave for

⁴³ Although French and religion are also said to be school subjects, these subjects are also not tested on national exams.

consistently teaching in the morning were because their head teacher desired for them to do so because the subjects of English, math, and Swahili were prioritized subjects and that students needed to be prepared adequately in these subject areas. NPS teachers explained that they did not consistently teach in the afternoon because “emergency” teacher meetings were held, students needed to work in agricultural activities at certain times of year, or teachers needed to hold meetings with parents. At FPS, too, I observed teachers to more steadfastly adhere to their schedules in the morning than in the afternoon.

Responses from interviewees about national exams: Students almost all meet this expectation. My interviews with parents in both sites revealed that national exams are viewed to be fair because they determine which students are sufficiently prepared to advance to higher levels of education. Many parents in both sites expressed satisfaction with the performance of the teachers at their school because the majority of students passed national exams to a much higher percentage than the national average. At FPS in 2010,⁴⁴ 44 out of 47 year VII students passed (93.6% average). At NPS the pass rate was 93.8 percent in 2011. This compared to a pass rate in Tanzania of only 58.3% on Standard VII exams in 2011 for the 983,545 pupils who took the exams (Tanzania Education Through Empowerment Association, 2011). At NPS it was reported that 98% percent of the year VII students passed national exams in 2010 and 2009. FPS teachers reported that 38/39 students (97%) passed in 2008; 50/62 (81%) passed⁴⁵ in 2009; and, in

⁴⁴ Data from 2011 exams could not be attained at FPS.

⁴⁵ Former FPS head teacher, Dawson Lemnge, explained that the reason so many failed the year VII exam in 2009 was because many students from this same class did not pass

2010, 44/47 (94%) passed. The majority of parents were satisfied with the preparation of students for the TMEVT's national exam by teachers at their children's school because a high percentage of students were now advancing to secondary schools.

How difficult are the national exams and what challenges do they offer students? I examined the tests that the teachers at both schools designed as well as copies of the mock exams that students took in preparation for national exams. I found that all tests designed by schools as well as the region, district, and ward followed a similar format structure. For example, the test items for the exams designed by teachers at Fadhili Primary School as well as the Mchanga ward, Imara district, and Arusha region mock exams were comprised solely of multiple choice test items, a matching section, fill in the blank answers, and true and false. I was informed by teachers that there were no essays or short answers on the tests and that the only test items that involved writing sentences was the section on school exams called dictation. This is when teachers read a sentence to the students and the students write the sentence that is spoken. I also learned that the grading system was arranged as follows: 81%-100% was an A, 61%-80% was a B, 41%-60% was a C, 21%-40% was a D, and 0%-20% was an F. Thus, any score above 41 percent was considered to be passing on exams, which was the same scale used for regular classroom work.

Questions about the rigor of instruction arose when I examined the results from end-of-the-year exams given to the year VI students in civics and math and to year II students in science and English. I found that more than half of the students received scores that were not passing because their scores were less than 40%. For example,

the year IV national examination in 2005. They had to repeat year IV again, and it was Dawson's view that these students were problematic.

although on the year VI civics exams, 24 students received scores of 40% or higher while 9 had scores below 40%, in year VI math, only 7 students had scores of 40% or better while 27 received scores of 40% or below. In year II science, less than half (10) of the students received passing scores of 40% or higher while 18 students did not. In year II English, only 13 passed while 16 did not. Despite the majority failing these exams mentioned above (70 out of 128, or 55 percent of the total scores were failing), I was informed by FPS teachers that all FPS students would still all advance to higher years of schooling in the following academic year because the end-of-the-year exams were not tied to advancement in years of schooling. Only the national exams in years IV and VII determined whether students advanced onwards or not.

Second expectation: Teachers must enforce school procedures. The expectation with the highest degree of importance after passing national exams was the ability of schools and their teachers to follow school procedures. These procedures are daily rituals that all teachers and students must follow even when/if they choose not to adhere to their teaching schedules. Even in low-performing schools that I visited during my initial school site visits, I observed that these procedures were carried out. The common characteristic of all aspects of the second expectation is that the emphasis on appearances or putting a good face on everything was a higher priority than other possible indicators of quality.

I learned that there are strong expectations in Tanzania for all schools to follow these procedures and the need for teachers to enforce them. These procedures and tasks include the following:

- Each day students must arrive at 7:00 a.m. in the morning or earlier to clean the school grounds by sweeping the corridors and walkways of debris and dust, trimming the plants in the school courtyard, and mopping the school's floors with rags.
- The students must line up in rows and teachers must inspect them to see if the students are wearing their uniforms appropriately.
- Firewood must be collected weekly from students at this time.
- The students must then sing the Tanzanian national anthem together and then are dismissed to march to class.
- Student leaders must keep track of the time and bang the metal bell located on the school grounds every 40 minutes.
- Although, in theory, primary school fees have been abolished by the national government, in practice, fees are charged for payment of the school guard, school cook, cooking supplies, and exam fees. Each child, in general, must also contribute corn and beans for the school lunch and manure for the school garden.
- Students must line up at the end of the day and the teacher in charge gives a speech.
- The students must sing other patriotic songs before the school day is officially closed and they are permitted to return home.

These procedures can be broken down into four categories. The first category is subsumed under procedures that are practically-oriented. These are important because of their utility in terms of serving to advance tasks required for the school to operate

effectively. This includes tasks such as the collection of firewood at the start of the week from each student, which provides fuel so that the school lunch can be cooked. Another example is the collection of monetary contributions from students that help to pay for school expenses, such as the school guard and cook, cooking supplies, exam fees, and also corn, beans, and manure.

The second category is the procedures that have utility only in terms of making the school look aesthetically presentable to visitors. For example, each day the students must arrive at 7 am to clean the school grounds. Another example is that the students line up in rows at the beginning and end of the day and teachers inspect if the students are properly dressed in their school uniforms. These procedures are important in order to have the school be viewed favorably by visitors. For example, the degree to which a student is dressed in their school uniform is seen as a reflection of how much discipline is effectively enforced at their school. School cleanliness and the ability of students to maintain clean uniforms is evaluated critically by school visitors and those who observe the students when they come from their houses or return home.

Another category is adherence to procedures that have utility in enforcing the school schedule. For example, I observed that a student leader in each school I visited was responsible for clanking the metal bell located on the school grounds every 40 minutes to announce the changing of the school period. What I noticed, however, is that, aside from the last bell of the day and the bell rung at break time when students rushed out onto the school grounds eagerly, these procedures were of no apparent utility to the students or school staff. That is, teachers at each school did not respond to the bell and instead continued to carry out the tasks that they were already doing. Having students

continue to ring the bell at the appointed times was likely still enforced at the schools because it was an important procedure required to be followed by the TMEVT so as to present the appearance that the school and its teachers were adhering diligently to their stipulated responsibilities, but neither the students nor the teachers responded to the bell, except when it was in their best interest to do so.

The last category is civic education rituals, which have utility in creating social cohesion in order to develop common attitudes and values in order to create a stable citizenry and unity so as to assume duties that are desired by the federal government (Heyneman, 2003). They are also required by the TMEVT. For example, the students at both schools were required to sing national songs while standing lined up in rows at the beginning of the day and then they must march to class while singing these songs. Students were also required to assemble and sing patriotic songs at the end of the day after the teacher in charge gives a speech.⁴⁶ While valued for the positive reflection of the school for visitors, these rituals were also related to the development on work ethic and discipline, which were highly valued in each of the communities but particularly at FPS.⁴⁷

At both FPS and NPS, I observed that teachers were expected to develop methods for enforcing these procedures. At NPS, for example, a system of corporal punishment was imposed by the administration, and students were caned for lack of compliance.

⁴⁶ Although students' performance of the songs was also required by the TMEVT, the emphasis on ritual may be negatively related to student cognitive achievement, as found by Torney-Purta, Oppenheim, and Farnen (1975).

⁴⁷ See under heading "Fifth expectation: Lead students to stronger work ethic" and also chapter 7, "Diversity of perceptions, values and opinions concerning schooling in the two communities."

Students were caned for noncompliance with rituals and especially for arriving late or not bringing three pieces of firewood. Caning for noncompliance with these procedures was, however, less frequent than for other reasons such as speaking aloud in class or not fulfilling assigned farm work at the midday break. For example, an excerpt from my field notes:

One morning during the 10:00 a.m. break, I stood in front of the students who were lined up at the back lot in rows. I noticed that sweat was dripping down the faces of some of the students already. I wondered how the students, who were still wearing their dark blue sweaters and were standing under the bright sun, could cope. Teacher Angela Phelisian came out. She was a stern veteran Chagga teacher, and she eyed the students fiercely.

“Who didn’t bring firewood today that was supposed to do so? Step in front! Quickly!” She eyed the year IV boy students and a few of them came out too slowly. Teacher Phelisian hit them each swiftly on their backside with her switch. “You didn’t bring firewood? Go and sweep the school ground and pull out weeds.”

Teacher Phelisian turned to the other students and said, “Year IV girls go and sweep the manure out of the cow barn! Year VI girls! ...Go and pull out spinach leaves from the cornfield for the school lunch. Go! Run!”

In contrast, at FPS, when students were non-compliant or did not adhere to the school procedures in the manner expected of them—not wearing a school uniform, arriving late, not contributing firewood, not fulfilling their duty to clean the school grounds—I did not observe teachers using corporal punishment. Instead, the teachers yelled at the students

and publicly embarrassed them in front of the other students. A last resort was to call their parents and speak to them in the teachers' office. Often this resulted in the head teacher sternly reprimanding the parent with support from other FPS teachers as needed.

Despite the fact that many of the schools with cultivation programs that I visited initially had low passing scores on national exams and teachers who seldom followed their teaching schedules, I observed that the teachers still enforced the procedures stated above. I would observe that teachers enforced the procedures listed above even in schools where teachers remained in the teachers' office and infrequently entered their classrooms to teach. The consistency in implementing school procedures strongly suggests to me that these are all rituals that state schools are expected to perform in Tanzania and which all teachers must therefore enforce, even including the schools that poorly perform. These procedures are important for teachers to enforce so as to show to outsiders that they indeed are carrying out rituals that teachers, students, and villagers are accustomed to and that all state primary schools in Tanzania are expected to be executing, even if student learning objectives are not met.

Third expectation: Increase resources provided to schools. Another expectation, subsidiary to the need for teachers to prepare students to pass national exams and for schools to follow given procedures, was to generate income. Since the period of ESR under the leadership of Tanzania's first president, Julius K. Nyerere, raising money was viewed by the TMEVT and by Tanzanian communities as a desirable way for teachers and students to spend their time. Ostensibly, these funds were to be used to improve the quality of teaching and learning.

This expectation is rooted in the history of Tanzania after its independence from Britain in 1961. From these origins, student participation in income-generating activities at school came to be viewed as a necessity. It was also inferred that students would develop skills for generating income independently in the future by participating in such activities at the school. As we have seen, major reformation of rural schools was initiated based on Nyerere's philosophy of self-sustainable schools and villages during ESR, from 1961-1985. Nyerere believed that, in order to be fully emancipated from Western colonialism, schools in Africa needed to be the center of the community and facilitate the process of "self-reliance" so that all of the community's needs could be met by its own agricultural activities (Lema, Omari, & Rajani, 1993). Community labor by students and villagers was unpaid because the cultural expectation was that people in the community should pitch in and help without expecting financial reimbursement

In theory, state schools within Tanzania still follow Nyerere's philosophy of self-reliance because state schools are expected to have a "teacher of self-reliance" (SR teacher). It is the responsibility of the teacher in this position to keep records of all expenses and profits made from school programs. The objective is to reduce school expenses by generating school income. The profits generated by the schools are presumed to be used to pay for school expenses.

Although state primary schools in Tanzania are expected to each have a SR teacher, I found that the relationship of the state primary school with their external donor often determined the extent to which teachers are allowed to generate income through school cultivation activities for their schools. FPS was forbidden by Oikos to generate income through its school cultivation activities. Since the Oikos garden program at FPS

required that all harvested crops be used in school lunches, FPS was not able to make a profit from farm activities. They planned to rent out some of the farm fields to local farmers the following rainy season, but were unable to do so due to the drought that occurred. However, I did observe that during the end of the year break in December that the year VI FPS students sold excess lettuce to the community but did not generate significant revenues in doing so. I was told that these revenues were used to purchase school supplies such as pencils and notebooks.

On the contrary, at NPS I observed that Nyerere's spirit of self-reliance was still being implemented. NPS proceeded to sell garden and farm produce after 4-H funding dried up in 2007. All harvested crops at NPS were either sold or contributed to school lunches. I found their SR activities to be far more developed than at any other primary school I visited. For example, the SR teacher at NPS, Mary Jesta Urasa, informed me that more than fifty percent of the cost for the construction of teacher lavatories for NPS teachers at the back of the school was provided through sizable profits generated through sale of the following products:

- **Corn:** Corn was grown two times each year. NPS makes the most substantial profit from this crop, at 700,000 shillings (\$400 USD approx) annually. The SR teacher told me that in last year's monsoon season, ten large sacks were harvested. Of this, eight sacks were sold and two were used to contribute to the school lunch. The NPS SR teacher said that this money was used to pay for inputs such as natural manure and seeds.⁴⁸ She boasted that in the cornfield at the

⁴⁸ NPS students were required to haul four buckets or sacks of natural pig and cow manure from the property of a Nyota village farmer who lived a kilometer down from school. I was informed that the payment for this manure was that NPS would later

side of the school a sizable amount of inputs were invested. For example, natural manure was purchased as well as seeds. This money was also used to pay for expenses of teachers such as chalk, test preparation fees, notebooks, and trips to Moshi that teachers must take.

- **Bananas:** Bananas were harvested a few times each month and were cut down by students and sold in the market by local women. The profits for bananas are approximately 20,000 shillings (\$12 USD approximately) per month. Last year the SR teacher said that the profit made was 150,000 shillings (\$90 USD approx). The major expense for growing bananas is the necessity of purchasing manure, since the school's livestock provides an insufficient quantity to be applied in the school's farm fields.
- **Garden produce:** Cabbage and *majimbi* (bracken or root) as well as garden greens, such as spinach and kale are grown during the rainy season. The year VII students sell these vegetables after school and keep records of the vegetables sold. The price paid by villagers and students and faculty from Tumaini Teachers' College is five vegetables for 100 shillings (less than 10 cents USD). As a result, the profits made from the selling of these vegetables is very low, at 40,000 shillings (\$25 USD approx).
- **Milk:** Milk from the school livestock is sold, contributing to the farm profits. The school's two female cows are milked by the school's Maasai guard.

provide him with the corn stalks of the harvested corn, which would be fed to this farmer's livestock. A year VI girl student leader was responsible for checking off each time the students individually brought one bucket of manure up to the school on her neatly organized list. "I will hit you if you are lying" is what she said repeatedly to one of the year III boys who had gathered around where she was writing in her notebook and was trying to have his name checked off.

Approximately five liters are sold each week for a profit of 2,500 shillings (\$1.75 USD approx). Thus, the total profit generated last year was 130,000 shillings (\$80 USD approx). In addition to this, the school sells calves for 250,000 shillings (\$150 USD approx). Last year, 2011, one calf was sold.

- **Goats:** The goats are also owned by the school. Last year three babies were sold for a total of 100,000 shillings (\$60 USD approx). The goats are not milked.

I was also informed that parents of each NPS student contributed 7,000 shillings for the construction of teacher pit latrines. Wood from trees planted by former NPS students on the school grounds two decades ago was harvested and used in this construction. The former NPS chairperson, Otto Moshi, confirmed that the willingness of the NPS teachers and community members to participate in improving the school facilities and lunch provided to students were major factors that enabled the school to improve:

When I was chairperson, I worked with [the NPS head teacher] to improve the school. With the community contributions, I was able to dig a well and also build toilets, a kitchen, dining hall, and corridor. Before there was a dining hall, the kids ate outside. This had been done without help from an outside source. The Rotary Club much later donated for the construction of the washbasins and the water tank. They just extended the work that we started. For example, the water tank pumps up water from the well that we constructed. I also worked with him to change from feeding the students *uji* (porridge), which was mostly water, to feeding them *ugali* (corn flour boiled in water and mashed), which fills them up. There was a big increase in the attendance of students after we fed them *ugali*.

In interviews, adult villagers commonly mentioned teacher collaboration with parents on increasing school resources as one of the major reasons for why they viewed NPS and its teachers favorably. For example, NPS mothers from a single parent household and an impoverished household, Mwanaidi Martin and Kanasia E. Urrio, discussed how there were better school lunches than before. They also felt that teachers effectively communicated with parents about the revenues earned. One NPS mother of a single parent household recalled:

The students eat better food [*ugali* and beans] than before. When I was a student they were only given a cup of *uji* (porridge) and never felt full.

This information was echoed by an NPS mother of an impoverished household:

The school is much better now because the students are fed *ugali* instead of *uji*.

Uji is just water and does not fill a child's belly.

Ultimately, the ability of the school to make and manage funds through farm profits influences parental satisfaction with the school, as we can see here.

Parental views of school quality related to available resources. Parents in both communities viewed their children's schooling to be satisfactory, especially in comparison to other Tanzanian state primary schools. A major reason for this perception was the presence of these additional resources, which were either generated by the schools or provided through donors and parental contributions in recent years.

Interview responses suggested that parental satisfaction with their children's school's performance hinged on the procurement of additional resources either through revenues generated by the school or through support from donors or the TMEVT. Their responses suggest generation of income to be the highest priority area for school

performance after national exams and adherence to school procedures. A major reason given for this high priority was because parents empathized with teachers who struggled because of limited resources. Responses showed that parents thought that teachers suffered from not having such resources as enough teachers, teacher housing, teacher latrines, an adequate school kitchen, and adequate teacher salaries. A minority of parents felt that the quality of teaching and learning was higher at times in the past when more resources were available to teachers. This view was expressed by Kanasia E. Urio, an FPS parent of a typical household:

[When] I was a child the teachers had their own housing. No teachers were late. There was more teacher rapport... Now there are not enough teachers. Each teacher must teach too many periods. There are too many students in some classes. Few students understand. There are not enough classrooms. Teachers need to have larger salaries.

The responses above illustrate that the provision of resources is a strong factor by which parents evaluate school quality. Their responses represent the belief that teacher motivation depends to large extent on the resources offered to teachers at their schools. However, their responses did not make clear how generation of additional income would lead to improvement of teaching and learning. This assumption that student learning could somehow be improved through increasing available resources was unsupported with explanations of how to do so. As with the second expectation of teachers enforcing school procedures, the outcome of student learning again appeared to be less valued than the appearance of the school such as having more resources, money, and housing.

Fourth expectation: Students gain income-generation skills applicable in their future. Another expectation related to resources provided to schools was the view that students, teachers, communities, and/or donors should learn skills at school that will be beneficial for them in the future. At both FPS and NPS, parents saw farming skills as being useful for their children even if they continued their studies beyond secondary school. Parents recognized that salaries for positions of employment in Tanzania were insufficient and that it would be necessary for their children to learn how to supplement their income with other work. Learning farm skills at school was particularly seen as a great advantage by NPS parents for their children in comparison to students at the majority of other state primary schools in Tanzania where there was no longer an emphasis on agriculture. One elderly NPS community member, John A. Nnko, shared a comment indicating that he placed much value on the learning of agricultural skills for their income potential:

Many students in other schools pass national exams but cannot use their hands; if they are out of work later on then they will starve.

However, when I checked with parents on whether students did learn new skills through the farming instruction at their schools, they repeated that, in general, students just learned what the local customs taught. Despite this, whether their children continued their education past secondary school or not, parents viewed the ability to conduct farm activities successfully as being the greatest benefit of student participation in the cultivation programs at their school. Even students who did not pass national exams could apply farm work skills in the future in order to generate income.

Many FPS parents of year VI students who participated in the garden program recognized the importance of students being engaged in school garden work activities. This was because 13 out of 36 of the students applied this work back at home by developing their own garden projects. One FPS parent, a typical mother, Matilda O. Kiwelu, shared:

My son is learning how to use a drip irrigation system at school. This is beneficial for him to learn because by using it there is no erosion from run-off. He is also growing his own garden of kale at home. He learned how to do this at school this year.

However, no other parents of FPS students noted such effects, and no NPS parents reported that agricultural knowledge was transferred home.

A goal of both of the donor-supported school cultivation programs at FPS and NPS was for students and their families to practice sustainable agricultural methods at their homes. Yet, the responses above illustrate that this objective was less important to parents than simply being able to earn extra money when needed.

Fifth expectation: Lead students to stronger work ethic. The majority of parents in interviews reported the lack of a strong work ethic among Tanzanian youth to be a national problem. Parents also generally stated that a major problem in their communities was that children were not working as hard as in the past. For example, the NPS chairperson, Jesse Martin Nnkini, said:

Nowadays in Nyota a great problem is that the youth do not want to do work. Their lifestyle is different than ours. This is because of globalization. The youth here see what kids do in London on television and movies and think that those

kids have a better life than they do. They do not understand that it is easier to feed yourself here than to get a job in competitive Europe.

Although parents appreciated when their children learned non-tested skills at school, such as agriculture and raising livestock, this appreciation was insignificant compared to their expectation that students should learn good work habits and beliefs in the value of hard work at school. This was particularly the case in the NPS community. For example, the NPS chairperson, Nnkini, commented about the work ethic that NPS students developed in comparison to the trend of other young people in Nyota:

The NPS students get a big benefit from their farm work at school because they learn to work hard. They are different than other youth in Tanzania; the others think that agriculture is something that does not bring any benefit. They just sit by their motorcycles and do not do anything all day and just drink spirits. They don't want to work, but they will rob you when get on the *dola dola* (public transport vans). Few students do hard work like NPS students. [NPS students] go home and do work there, too.

Parents at both schools expressed that the lack of work ethic amongst Tanzanian youth nowadays was a great change from their own experiences in the past. For example, the FPS head teacher, Gipsam Mlay, agreed with the NPS school chairperson, Jesse Martin Nnkini, that Tanzanian youth desired to do less work because of globalization and television:

Before [when I was a child] teachers gave orders to students to work by hand. Children helped other families by working in the farm fields of their neighbors. Now school subject study is the only focus in most government primary schools

in Tanzania. Through television, the youth here see how children in richer countries use machines instead of working by hand. [Children here] want to use machines too instead of working by hand. In our village, the youth work hard in tomato fields in order to make profits so that they can build houses or buy a truck or a tractor. A large percentage of youth here just do this work.

Other parents attributed the lack of work ethic amongst youth in their communities being due to the “easy money” that youth in their communities can now make. This money can be earned through farming activities in their community, such as producing bananas in Nyota village and tomatoes in Mchanga. In both communities “easy money” could also be attained by male youth through purchasing a motorcycle and offering lifts to passengers for payment.

In contrast to their perceptions of a diminishing work ethic amongst Tanzanian youth in general and also youth in their community, parents and teachers in the NPS community proudly agreed that the NPS students developed a great sense of work ethic in school farm activities. They reported that one of the effects of conducting school farm work was that their children applied hard work in their household chores. They were also sure that their children would utilize these skills later on in their lives.

In contrast to the tendency of FPS parents of viewing particular farm activities as being valuable, such as the planting of certain crops and the learning of new agricultural techniques, NPS parents expressed less concern for the nature and type of farm work in which their children were engaged at school. Rather, there was satisfaction reported amongst NPS parents about the ethos of hard work cultivated by their children. One reason given for this was because, as the veteran male NPS teacher, Fuatael Mlay,

emphasized, work ethic is an important habit emphasized in the Chagga tribe culture of Nyota village, which is indicated by his statement: “We believe that there is no development without work.”

Sixth expectation: Give teachers support and avoid criticism. My time spent at both school sites revealed teacher practices that could be controversial:

- pervasive teacher absenteeism at both schools,
- students at FPS—and to less of an extent at NPS—were pulled out of class to prepare lunches for students,
- students acted as monitors to supervise classes instead of teachers at NPS,
- school garden crops were consumed by teachers at FPS, and
- some teachers at NPS used corporal punishment excessively.

However, in my interviews, I found that students and parents were generally supportive of teachers and were careful to not to criticize them. This avoidance of criticism supports the idea that there was an unwritten expectation for parents and community members to avoid denigration of their schools, especially in conversations with outsiders.

Aside from opposition to students being pulled out of class at FPS to prepare lunches, in interviews, the majority of parents did not speak out against these practices at their schools. One possible reason I found for this was because the level of education of NPS and FPS teachers was generally higher than of the parents in these rural villages, and therefore parents deferred to teacher judgments. Often times parents stated that they did not have any views about the decisions made by teachers and that it was the responsibility of teachers at their children’s school to make those decisions.

Parents justified their lack of views about the actions taken by teachers at their school by stating that they had never observed teaching practices at their children's school within the classrooms. In fact, all of the parents interviewed stated that they had never observed a lesson given by a teacher at their children's school. They stated that they were unable to observe the classroom lessons of teachers at their school because they were not allowed to do so by teachers.

When I asked parents how they knew if the teachers at their children's school were teaching effectively, many parents replied that they evaluated this by the quantity of information filled out by their child in their school notebooks that were taken home. For example, an NPS mother from an impoverished household declared that she had a positive impression of the teaching at her child's school even though she had never observed what went on in classrooms. For this mother, the effectiveness of her child's school was based on the content of what he wrote or copied in his student notebooks. Like other NPS parents, she also monitored her child's progress through his scores on monthly exams in comparison to her other children.

Attesting that they had no chance to observe how teachers were carrying out instruction within their classrooms, parents at both schools stated that they evaluated the effectiveness of teachers through other means. The first method they used to evaluate teachers was whether students were passing national exams in year VII to advance to Form I of secondary school. Another factor was the degree to which teachers communicated with parents at meetings that were held. In the case of NPS, parents were satisfied with their school in general because teachers took time out to explain to them the profits that were made from livestock and farming activities at meetings that were

held. They viewed the performance of NPS teachers positively also because teachers permitted the parents to ask questions at these meetings, as one NPS mother of a typical household, Masawe Morera, explained:

I am happy with the school. At a meeting that was held [prior to the start of this school year], 70 parents attended. We were told that we must contribute corn, beans, and 21,000 shillings for the child's education. [NPS teachers] also explained about the expenses and profits made from each farm project at the school. After the teachers had finished explaining this then the parents were permitted to ask questions. After this, all of the parents thanked the teachers because they were satisfied with what they had accomplished.

This example illustrates how parents were satisfied with their children's school based on the amount of income generated through their farm program and not on how teachers behaved and the degree to which students learned within NPS classrooms.

Parental perception of school performance reported in interviews provided evidence that parents in both communities evaluated the performance of teachers on the basis of factors that were not directly related to the quality of the teaching methods used within the classroom or their time spent interacting with their students. Rather, parents weighed teacher effectiveness based on quantitative indicators available to them, such as the amount of information written in their school notebooks, the rate of passing on national exams, and the profits and resources gained by the school in its farm and construction projects. Another additional factor was the ability of teachers to facilitate farm activities and school lunch programs at their school as well as the effectiveness of teacher communication with parents at meetings held with the community. Thus, student

learning itself did not enter directly in their assessment of teachers' performance at their school.

Conclusion

This chapter illustrates expectations that primary schools are expected to meet in two Tanzanian communities. Aside from procedures to be followed for preparing students for national exams and school procedures, oftentimes these expectations do not operate as formal TMEVT policies for goals that Tanzanian schools must attain, but instead as informal community norms. Examples include increasing school resources and imparting knowledge to students about how to generate income in the future.

Some of these diverse expectations are consistent with goals set by the TMEVT for students to pass national exams. Likewise, national authorities were responsible for establishing teachers' duty to enforce school rules and procedures, such as lining up at the beginning of the day in their full school uniforms, marching to class in unison, and contributing firewood for school lunch. By performing these rituals, a consistent schedule is followed, through which students are demonstrated to be in class and are assumed to be learning the given materials that prepare them for national exams. However, these duties involving the maintenance and upkeep of the appearance of the school, its grounds, and its students often were concentrated on in lieu of classroom teaching duties.

Other expectations conflict with the TMEVT's major expectation that students will pass national exams. For example, the expectations that schools be able to generate additional income and train students so they can develop work ethic and acquire knowledge and skills not tested on national exams often leads to teachers enforcing

student work activities at school where students are not engaged in formal learning within classrooms and thus not directly preparing for examinations. At NPS I observed that students were only taught the first three periods each day for an entire two weeks while corn was being harvested in the month of March. At FPS I observed that the multiple job responsibilities teachers have on top of their regular classroom teaching responsibilities often led to teachers not adhering to their classroom teaching responsibilities. Ultimately, while one of the expectations (preparation for national exams) for teacher and student performance supported learner outcomes, the priority placed on appearances, income generation, and resource accumulation through the farm directly often directly interfered with academic student outcomes.

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CHAPTER 6

Changing Expectations and Practices: The Oikos Intervention

The following two chapters focus on the ways by which the non-governmental organizations 4-H and Oikos sought to improve the quality of schooling and livelihoods in each community in their targeted projects. The intentions of the donors were meant to be consistent and reinforce the policies, rules and procedures stipulated by the TMEVT. However, I found that their programs reinforced only some of the expectations discussed in the preceding chapter: generation of resources for schools, the desire for students to gain income-generation skills applicable in their future, and that schooling should lead students to a stronger work ethic. A main approach of each of these donor-supported programs for accomplishing this expectation was through student participation in school farm and garden activities.

While the goals of the NGOs were similar, both of the programs were trying to push the schools in a different direction than other state schools in Tanzania in terms of motivating teachers to be facilitators of successful school garden/farm programs. In order for teachers to facilitate student activities in this capacity, both programs were centered on the provision of training for teachers in agricultural skills (Oikos and 4-H) and, in the 4-H program to some extent, participatory teaching methods.

The following two chapters will highlight some of the differences in the two NGOs approach. For instance, one of the major differences was that the approach used by Oikos in the Fadhili hamlet also included the contribution of school resources. Another significant difference was that while the Oikos program at FPS focused on

improving the health and nutrition of FPS students through organizing community and teacher participation in a school lunch program, the 4-H program at NPS centered on the development of practical business skills, work ethic, self-esteem, and social skills by NPS students. Interestingly, the 4-H program had been previously introduced at FPS and other primary schools in Mchanga village. However, I learned that these 4-H programs had been previously pulled from the area by the 4-H headquarters due to lack of program progress. The school garden projects of Oikos were begun at FPS and other schools in Mchanga village at a later time.

Each chapter begins by summarizing the objectives of the NGO and how they are organized. Next, the particular objectives and structures at FPS and NPS are described in detail. In order to better understand the structure through which these programs were organized, in the first part of this chapter, diagrams are used to illustrate the plans for how certain aims to be implemented. Each diagram describes a “chain of influence” for each of the particular groups of stakeholders involved in each community through which the objectives, strategies, organization, and desired outcomes are labeled and the relationships between them are described. The particular groups of stakeholders are subdivided into schools, teachers, students, and parents/families in the communities. My creation of these diagrams was inspired by Carol Weiss (1997) publication, *Evaluation: Methods for Studying Programs and Policies*, which called for making explicit the theory underlying any given intervention and using that as the basis of program evaluation. I developed these diagrams in response to the use that Dr. Teresa Tatto and Dr. Jack Schwille at Michigan State University made of Weiss’ approach in their teaching as well as to Weiss’ text.

In the second part of each chapter, I argue that many of the objectives of the donor-supported projects fell short at FPS and NPS because of constraining factors. The weakening of the projects in the communities was found to be a result of structural constraints within Tanzanian schooling, lack of follow-up support to ensure changes in behavior, and encumbering environmental conditions. Due to the lack of follow-up support in changing teacher pedagogy and the nature of student learning in the garden by the NGOs' staff, I show how teachers reverted to the traditional teaching pedagogy used in sub-Saharan Africa pertaining to student work in school gardens/farms where (a) there is limited focus on student learning of innovative agricultural skills and (b) student farm activities are prioritized for crop production, raising income, and also developing work ethic and discipline (Riedmiller & Mades, 1991), instead of enhancing student learning outcomes. This is consistent with the expectations for teacher and student behavior laid out in chapter 5, which, aside from national exam preparation, are centered on generating school resources, preparing students to generate income in the future, and learning the value of hard work.

About Oikos

Istituto Oikos is a non-profit organization founded in Milan, Italy, in 1996, and the program is currently in operation in Europe and in developing countries. The overarching objectives of its programs are to fight poverty through promoting the conservation of biodiversity and the sustainable use of natural resources. What distinguishes Oikos from other well-known NGOs is that Oikos uses an integrated approach to experiment with and promote strategies and technologies that are beneficial to local communities by using their own resources for production.

Oikos has been active in Tanzania for the past 15 years, working mainly in the Mount Meru area, situated on the eastern limit of the Rift Valley. Mount Meru is a large (4,564 meters) dormant volcano covered with a dense forest that supplies water to roughly 500,000 people living in the area. In this region, Oikos' commitment is to provide vulnerable people with the necessary means and tools to increase food security. Its activities are aimed at strengthening the three pillars of food security: availability, access, and proper use of available technologies (Istituto Oikos, 2011b). At the time this research was conducted, the Oikos program had a diverse range of areas in which it worked with individual schools and their surrounding communities in the eight sub-villages surrounding northern and eastern Mount Meru on the other side of the mountain from Arusha town in Arusha region.

One target area of their involvement in these institutions was school improvement. Through their three-year Cultivating Future at School project, begun in April 2010 and funded by Intervita Onlus, Istituto Oikos aimed to improve the educational level as well as the use and consumption of food at 22 state primary and secondary schools in rural areas of Oldonyosambu and Mchanga Wards in northern Tanzania through (a) construction of kitchen facilities so that school lunches could be cooked for students; (b) the provision of safe, clean water for cooking and drinking when available; (c) working with communities to organize the provision of healthy school meals; (d) the provision of school resources like playgrounds, books, desks, cupboards, and computers; and (e) clean energy projects such as the installation of solar energy and wind turbines. The project targeted 8,000 children between 6 and 16 years of age, 120 primary schools teachers, and 10,000 community members (Istituto Oikos, 2011a).

Oikos' 22 school garden programs also served as an extension of its goal of encouraging sustainable agricultural methods. A focus of the program was on preparatory training of teachers and community leaders, teaching innovative agricultural methods especially pertaining to reducing water usage and promoting organic pesticides, and training parents and students on the importance of good nutrition. In informal discussions with the Oikos project manager, he stated that, during their two-year Food Facility and Cultivating Future at School projects from 2010 to 2012, Oikos had two million dollars provided by the European Union and only 22 months to spend it all (Istituto Oikos, 2013). With this funding, Oikos attempted to carry out a set of strategies in all of the eight villages. These strategies included promoting the development of small businesses, encouraging economic development, and supporting local production. In addition to conducting projects in beekeeping, poultry, and irrigation within the communities around Mount Meru, they endeavored to improve the use and consumption of food. They did this by conducting surveys on pesticide residues, campaigns and trainings on hygiene and child nutrition and by promoting a reduction in the use of synthetic pesticides.

While Oikos' main objective was to promote better nutrition and sustainable agriculture and environmental practices in rural villages surrounding Mount Meru, the role of students in such projects was left largely undefined. As will be shown in this chapter, this aspect of Oikos differed significantly from the donor-supported 4-H clubs in state schools in northern Tanzania, where the active participation of students was explicitly called for⁴⁹.

⁴⁹ Other community benefitting initiatives addressed by Oikos include (1) Access to water—Oikos' water project promotes the sustainable use of water for agricultural use. A team of experts technically supported the rehabilitation of traditional irrigation

Oikos was organized in Tanzania through leadership from its Italian staff, who are experts in agronomy, water issues, engineering, education, and environmental sustainability. In projects in Tanzania, they hired Tanzanian employees, who were technicians in engineering, agronomy, and community development. Decisions for projects were made in conjunction with a Tanzanian, who was the executive of their East Africa office in Arusha town (C. Bugiardini, personal communication, December 12, 2011).

The role of their hired Tanzanian community extension worker was to link the projects to the community by meeting with parents to disseminate relevant information about the projects and to communicate with the villagers about the project and answer any questions or concerns they had. However, this did not include processes for participatory decision-making of the villagers. This was a likely consequence of the short span of the project (22 months) and the need to operate quickly due to the pressure of the deadline. The implications of these restraints were that the structure, scope, and design of their projects were mandated through orders given by the Oikos expatriate staff rather than informed by the needs and contributions of adult community members.

Another subsidiary goal was for communities to *learn sustainable agricultural methods* that protect the health of the environment. Tomatoes are the main crop grown by farmers in Mchanga. Their tomatoes are delivered by the truckload to Mombassa and

channels and the installation of water-saving irrigation systems, such as drip irrigation; (2) Increased protein intake—Through Oikos' two-year Food Facility project, started in 2010, Oikos reported creating more than 40 poultry groups with 230 households participating. The goal was to increase the participants' accessibility to foods high in protein and (3) Honey—The two year Food Facility project, started in 2010, supported 32 honey production groups for the benefit of 290 people.

Nairobi in Kenya and Dar es Salaam and Zanzibar in Tanzania. Although the parents' and teachers' committees voiced their preference for desiring to grow tomatoes in the FPS garden at these initial meetings, Oikos did not permit them to do so because they viewed tomato farming as unsustainable due to over-application of pesticides by the farmers in Mchanga.

Oikos found that farmers in the village of Mchanga were over-applying store-bought pesticides and store-bought fertilizers in order to harvest tomatoes. They anticipated that the effects of using such methods on their land over time would be lack of soil fertility and contamination of Mchanga's water systems. Through their work in their 22 schools, they intended to change the views of parents and students in order to recognize the long-term effects of relying on such methods as well as increase the understanding of how the farmers could apply organic agricultural methods and the benefits of doing so. They attempted to accomplish this goal by forbidding the use of store-bought pesticides and fertilizers within the school gardens and gardens run by women's groups in its targeted communities. Through my conversations with the residents, it became clear that the over-application of pesticides was also an acute problem in the community; I learned that during the previous year in 2010 two children were poisoned with pesticide when they ate tomatoes from the farm field of their father. One of them died. From my field notes:

Later in the day I rode my bike over to the Mchanga Health Center and sat down to speak with Edson Mmbando, a young doctor from Kilimanjaro. He told me about how a child had died this year in Mchanga in May because of pesticide poisoning. The boy was 12 years old and went out with his brother of eight years

old to the field. While they were there they both ate tomatoes. On the way to the health center the brother that was 12 years old died, and there was nothing that could be done. Fortunately, Mmbando was able to save the life of his younger brother. He did this by giving him an IV drip of four liters, an atropine injection, tablets to reduce the swelling in his stomach, and also by raising his legs higher than his stomach. After two days the younger brother recovered. However, his older brother had passed away, and his father was left to deeply grieve for the loss of his child that was ultimately his responsibility since his child was poisoned because of eating a tomato in his field.

This scenario illustrates the lack of knowledge in Mchanga village about the appropriate quantity of pesticide to use in farming.

During my informal conversation with the Oikos project manager, he explained to me the reasons that Oikos did not support tomato farming in Mchanga. There is a specific Tanzanian agency, the Tropical Pesticides Research Institute (TPRI), that authorizes pesticides imported by companies from Western industrialized nations and especially from Europe to be sold in Tanzania. The project manager did not place much regard in the creditability of the TPRI work because, when TPRI did a survey for Oikos, neither the number of reported cases of pesticide poisoning nor the harmful effects of using particular products were included.⁵⁰

⁵⁰ The Oikos project manager, Aroldo Filipepi, contended that the reason for many of the pesticide poisonings in Tanzania was because the pesticide bottles sold in stores say: “Use this bottle for one hectare.” A hectare is 10,000 meters squared. However, in Tanzania, the land measurement used is an acre, which is only 4,047 meters squared. Thus, Tanzanian farmers commonly apply two and a half times more of the pesticide on their farm fields than what is recommended because they assume that an acre and hectare have the same area. The result is that, after mixing pesticides with water, the farmers in

Out of the five total vendors that sell pesticides in Mchanga, the Oikos project manager stated that there is only one qualified pesticide vendor. According to him, none of the pesticide vendors in Mchanga inform their customers about the effects of the particular pesticide products that are sold. In my interviews, I learned that the average amount spent on store-bought pesticides and fertilizers per acre of tomatoes in Mchanga is 1,000,000 shillings (\$680 USD approximately). The return on tomatoes can be very high in times of drought and at certain times of the year, but in recent times many farmers often do not break even because of the high costs of store-bought pesticides and fertilizers. According to the Oikos project manager, Aroldo Filipepi, this is “a big disaster.” The perspectives of the Oikos staff on tomato farming in Mchanga are included here so as to provide an explanation for their rationale in only supporting organic school garden programs and prohibiting the growing of tomatoes in these programs. These details are important because they provide an explanation for the emphasis of their institution on environmental sustainability in their programs in northern Tanzania. Interestingly, though, their programs did not try to mitigate the problem by endeavoring to show farmers how to correctly apply pesticides, but instead Oikos coordinators refused to allow them to plant tomatoes at all.

Mchanga use 800 liters per surface area of one acre, which is four to seven times as much as what should be applied. These farmers hire farmhands who commonly come from Maasai areas located in dry areas further below Mchanga, who mix cocktails from a minimum of three pesticide products up to what they normally use, which is five or six different types. According to the Oikos project manager, these products are often mixed with their own hands.

Chains of Influence to Accomplish Project Objectives

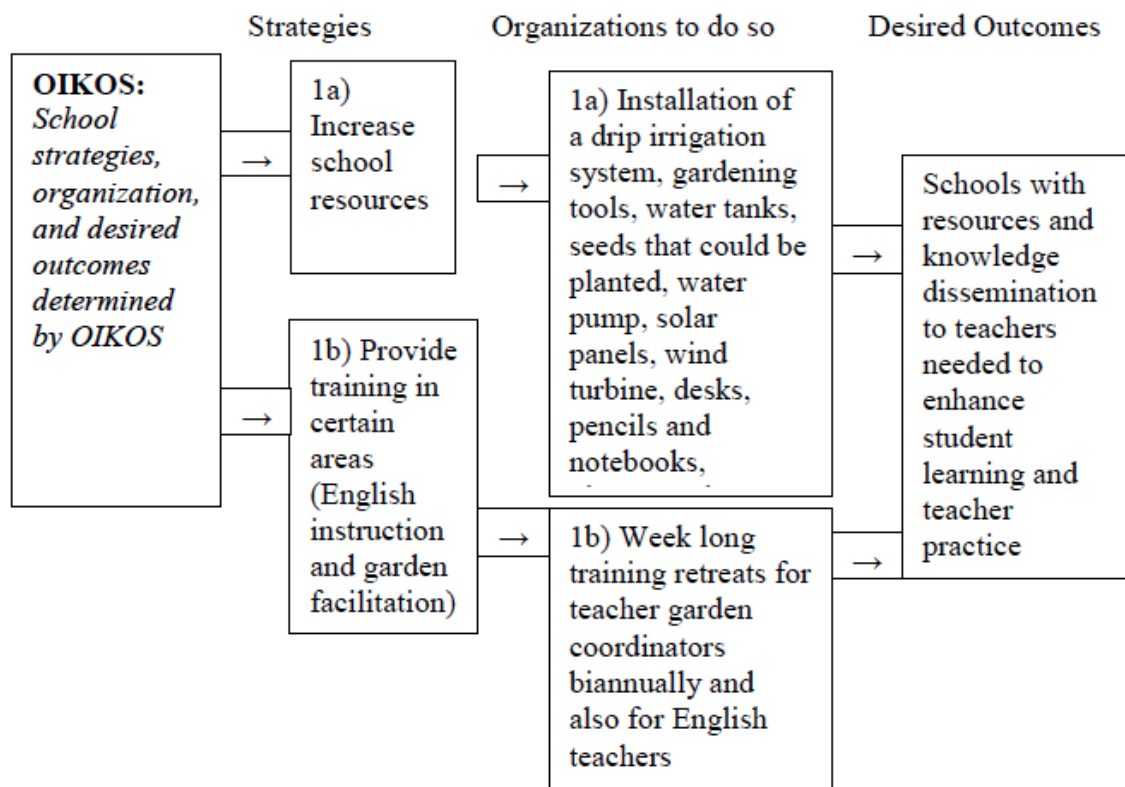
The following are the project objectives for each particular group of stakeholders. The stakeholders include (a) schools, (b) teachers, (c) students, and (d) adult villagers. The diagrams in Figures 7–12 and Figures 13–15 serve to compare the FPS groups. The reason the diagrams are used is to illustrate the complex strategies the donors used for endeavoring to enact change. For each stakeholder, there are one to three chains following the different objectives, the organization necessary for achievement, and the intended outcomes.

Chains of Influence to Change Teacher Practice and Learning Outcomes at FPS

Figure 4 shows the chain of influence at FPS adopted through the Oikos approach to working with teachers to foster improved learning outcomes. The figure starts with the Oikos goal, which is to change teaching practice and student knowledge and attitudes, and then moves on to the strategies, organizational measures and desired outcomes in the Oikos attempt to achieve this goal. Thus, the first chain shows the strategy of increasing school resources, which is then connected to installation of school equipment (drip irrigation system, water pump, etc.), with the desired outcome of improving school outcomes (national exam results), student motivation, and the quality of teaching and learning.

Figure 4. Chain of Influence for FPS School

Goal: *Change available resources and agricultural knowledge of teachers*



The second chain in Figure 4 uses a strategy of providing training to teachers in certain areas (English instruction and garden facilitation), and to accomplish this outcome teachers were given weeklong trainings biannually at the Oikos Training Centre. Here the desired outcome was to also to improve teaching and learning, student motivation, and school outcomes. Please note that the second chain in Figure 4 is duplicated in the second chain in Figure 5 and Figure 7 because the provision of training at the Oikos Training Centre was a main strategy that was used for schools, teachers, and villagers.

Explanation of objectives for school. The Oikos donor-supported school cultivation project endeavored to change teaching practice and student knowledge and attitudes about school agricultural practices. Oikos sought to accomplish these changes

through the training of teachers. Oikos intention was to initiate these changes through the provision of a wide variety of school inputs at FPS (see Figure 4 under Strategies).

Since funding was not guaranteed for Oikos' projects after the two initial years of their work on school gardens in Mchanga and their money needed to be spent within this period of time, a central strategy Istituto Oikos used for trying to improve school quality at FPS was to increase school resources. Oikos therefore provided inputs in a variety of areas within its 22 schools. Their provision of agriculture inputs at FPS consisted of the following:

- (a) a drip irrigation system (a series of tubes running from the school's water tank with distance spaced holes in the tubes out of which water flowed to crops planted in the garden);
- (b) gardening tools (shovels and hoes);
- (c) water tanks (eight large tanks were provided to each school and rain water from the school's roofs drained into them); and
- (d) seeds that could be planted. (Two times each school year, school garden teachers were provided with training from AVRDC, the World Vegetable Center. AVRDC also provided different types of seeds. Some of these seeds were traditional crops grown in the area, such as cowpeas and okra, while others were drought-resistant varieties, such as amarands, African nightshade, and the bambara groundnut.)

In addition to these farm-related provisions, other inputs were provided to improve its schools. At FPS, Oikos provided the following:

- (a) a water pump;

- (b) solar panels (placed on the schools' roofs so that all classrooms had functional lights by the end of my stay in Mchanga);
- (c) a wind turbine (along with the solar panels this contributed to powering the school's electric system);
- (d) desks (enough desks were constructed in classrooms so that all students could sit two at a table);
- (e) pencils and notebooks for students to use;
- (f) playground equipment (constructed during the time that I was at the school and included a slide and swings);
- (g) a single laptop computer (all of the school's teachers were expected to use this in order to conduct their work more effectively)⁵¹; and
- (h) textbooks (provided for each subject area with enough so that pairs of students could share them).⁵²

The objectives and strategies of Oikos at FPS were predetermined by Oikos. One exception was that in the meetings with the Fadhili community, the FPS school committee was permitted to decide which seeds would be planted in their school garden. Aside from this, the input of the FPS community was not considered in project decisions. As shown in the excerpt below from the interview with the Oikos school garden

⁵¹ This computer was stored at the house of the female school garden coordinator by the time I arrived for my observations. I had not witnessed it being utilized by teachers to conduct school work.

⁵² These were stacked on the teachers' desks, and many became waterlogged due to the strong rains at the end of the short rainy period during the monsoon season, which spilled through the leaking ceiling of the teachers' office.

coordinator, Claudia Bugiardini, it was the view of Oikos that their program could not be made compatible with the community's first priority in terms of seed selection.

Roberts: How were the seeds selected that were distributed to the FPS school and women's group gardens?

Bugiardini: We did a meeting with the parents' committee and the teachers' committee and we selected [the seeds] with them on the basis of experience, taste, and whatever they liked. We guided it so that whenever they chose something that was totally unsuitable for the area but which has a good market and they like the taste of it, we said, "No, this is unsuitable and we are not going to buy it." Tomatoes, for example. Everyone wanted tomatoes, but we didn't buy any tomatoes for them at the schools because they spray them and we wanted the gardens to be fully organic, and also moist areas are not suitable for tomatoes. The tomato is an irrigated crop. But, yeah, there was a selection based on the meeting that we had with them.

As demonstrated by the above quote, the coordinator did not view tomato growing to be suitable for the Oikos school gardens because of the over-application of pesticides, which could negatively impact the health of the students and teachers as well as the long-term sustainability of agriculture in the communities.

Another strategy that Oikos used to improve school quality was through hosting weeklong teacher trainings at their Oikos Training Centre in Mgamia hamlet located in a Maasai area 15 kilometers above Mchanga village. During these weeklong trainings the teachers slept at the Mgamia Training Centre and ate their meals there. These trainings varied in scope and only provided training to one or two teachers at each school per

training. These teachers were selected based on if they were agriculture teacher coordinators at their school. However, other weeklong retreats were hosted for the teachers who taught English at their schools. The rationale for training teachers in English was that students needed to be adequately prepared to pass the English portion of year VII national exams as well as the national exams given in the second year (Form II) and fourth year of high school (Form IV). During the week of training in agriculture provided by Oikos that I attended, teachers and community leaders from Mchanga and other villages located on the north and eastern side of Mount Meru were also invited to attend. The information covered included how to compost, make raised garden beds, and grow bag gardens. At the end of the week, they were then ordered to carry out doing this themselves back in their communities and were also instructed to teach these skills to others in their community. There was no infrastructure where training of other adults could be accommodated aside from meetings with women's groups. These were programs where the general method of instruction was show and tell. In some cases, participants then repeated themselves the activities demonstrated by the facilitator. No follow up support was provided when the participants returned to their villages (as illustrated under the section "Constraining Factors of Projects" later in this chapter).

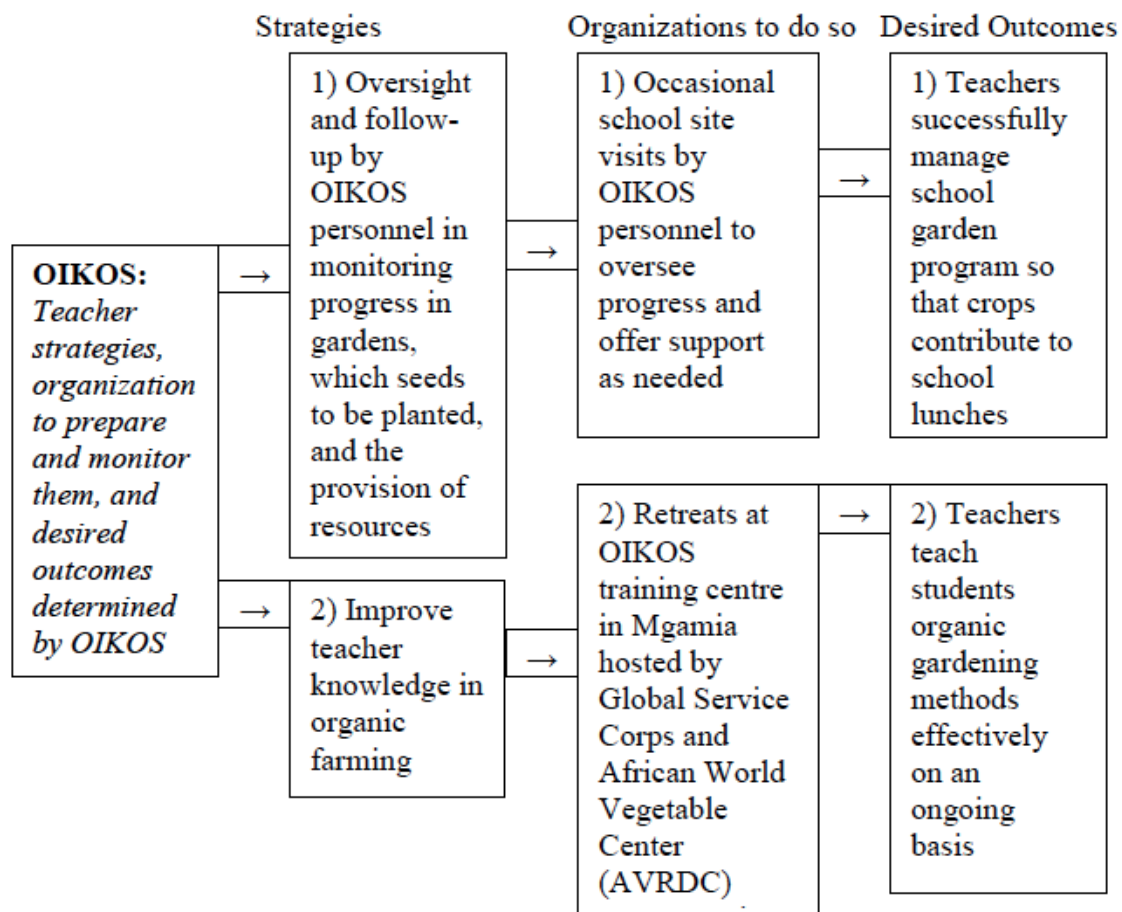
Chains of Influence to Change Teaching of Agriculture

A major focus of the Oikos-supported programs was the provision of training and technical support to teachers about facilitating effective school farm programs. Oikos endeavored to do this through the provision of intensive training sessions for teachers and follow-up support on site at the schools as needed (see Figure 5). Note that Figure 5 does

not include training of community people, but this is included in Figure 7 in the following section “Chain of influence for adult villagers in FPS community.”

Figure 5. Chain of Influence for Teachers in FPS Community

Goal: *Change teacher practice, knowledge, and attitude in teaching agriculture*



Explanation of Chain of Influence for FPS teachers. In this diagram, there are two chains, one in which oversight and follow-up by Oikos personnel is assumed to result in the desired knowledge of how to successfully manage school garden program so that crops contribute to school lunches. The second chain is concerned with improving teacher knowledge in organic farming. In this chain, the teachers are trained with the intent to teach students organic gardening methods effectively on an ongoing basis.

The objectives established by Oikos expected FPS teachers to effectively facilitate organic gardening skills and manage school garden programs in order for crops from the school garden to contribute to school lunches (see Figure 5 under “Desired Outcomes”). As described by the Oikos school garden coordinator above, preparation of teachers for accomplishing this task was centered on training at Oikos training facility above Mchanga in Mgamia hamlet (again refer to Figure 5 under “Organization to do so”). Through my participation in the agricultural training provided to teachers and community leaders in Mchanga village at the Oikos training centre, I learned that the nature of the instruction that teachers were given by Oikos was focused on improving agricultural methods used in school garden activities and not on the teaching pedagogy used by teachers in facilitating such programs. A good example of this point can be found in my field notes from an Oikos garden training for teachers and community leaders:

In this training, the Oikos teacher trainer hired from the Global Service Corps, admitted that she was not a trained teacher. I observed that throughout the week she did not ask the participants any questions about how this process could be applied within their hamlets, in their hamlets’ women’s groups, or in their hamlets’ schools. I wondered how Oikos expected the teacher-participants to apply composting in their own schools when the teachers were not being provided with training about how to apply this knowledge directly in an educational setting. I observed this training to be focused on imparting knowledge to teachers about methods for growing certain crops. However, pedagogical methods by which teachers would teach these skills to their students were not included.

While Oikos provided information about the agricultural techniques that would contribute to their desired outcome, their support on an organizational level and on an individual level for the implementation of these methods and the pedagogical best practices for imparting this knowledge to the students was demonstrated to be weak, which directly impacted the success of these ventures.

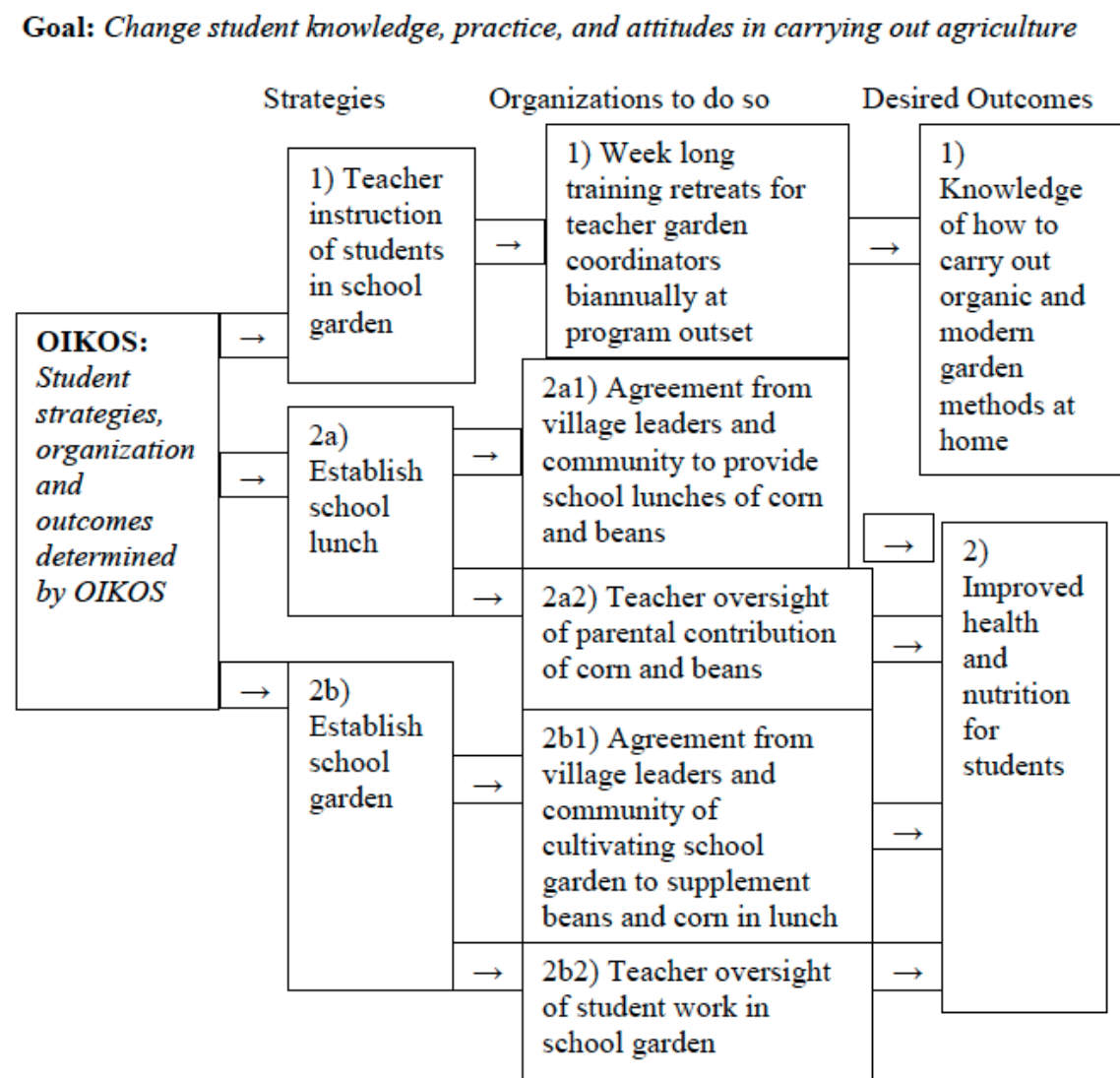
In addition to these weeklong training sessions provided to the school garden coordinators at Oikos' schools, I also observed that Oikos staff frequently visited FPS in order to provide support as needed. However, generally their time was spent on the logistics of getting the donated resources to the school or making sure that resources were being provided to their 22 schools such as wind turbines, fruit trees, solar energy, the construction of kitchens, school garden materials, and rainwater harvesting tanks. This focus on material components was driven by the necessity to spend their funds within 22 months.

One concrete way that Oikos input changed previous FPS practice was by requiring FPS teachers to facilitate and manage school lunch programs at their school. Before, FPS did not have a school lunch program. According to the former FPS head teacher, the FPS school committee agreed to adhere to this new requirement at the first meeting in their community held by Oikos. During my time spent at FPS, I observed that the FPS teacher responsible for facilitating their school lunch program did so by maintaining records of students who had contributed the lists of the required portions of two *debe* (bushels) of corn and one *sado* (two liter container) of beans. This teacher was also responsible for organizing and delivering school lunches.

Chain of Influence for Changing Student Knowledge, Practice, and Activities at FPS

The donor-supported programs at both sites sought to improve agricultural methods carried out in households through student participation in school cultivation programs (see Figure 6). Some members of the community explicitly supported these aims. The donor programs did not collect evidence on whether these skills were developed.

Figure 6: Chain of Influence for Students in FPS Community



In Figure 6, there are three chains. In one, week-long training retreats for teacher garden coordinators and the provision of follow-up support is assumed to result in knowledge about the effective implementation of organic and modern gardening methods at home, which the residents of the household are intended to implement as a result of their children's education. The second and third chains are concerned with the desired outcome of improving health and nutrition of students, and these objectives are to be achieved through the community buy-in of parents, demonstrated through contribution of food to school lunch programs with teacher enforcement of this policy and the facilitation of student work in the garden, thus teaching students effective methods to be applied at home. The goal is to catalyze improvements in student health and nutrition through the introduction of a school lunch program and healthy produce harvested at home.

One of the primary objectives of Oikos' garden program focus at FPS and other schools in Mchanga was to grow produce that would supplement the school lunch in order to improve student nutrition (see Figure 6). In addition to requiring parents of students to contribute two *debe* (bushels) of corn and one *sado* (two liter container) of beans for the school lunch, the vegetables and fruit harvested from the school garden were to be served in school lunches in order to improve nutrition amongst its students, of which 65 percent in Mchanga were reported as being malnourished in baseline research conducted by Oikos (Istituto Oikos, 2011).

Unlike the traditional role of school gardens after Tanzania's independence of selling produce in order to offset school costs (Lema, Omari, & Rajani, 1993), Oikos did not permit FPS to sell its crops in order to make a profit. Instead, a "memoranda of understanding" was signed where teachers signed a declaration that "the crops are for the

students and not for the teachers.”⁵³ The FPS teachers were given the responsibility to manage the school lunch and garden programs at their school and ensure that an appropriate quantity of the garden vegetables were provided to their students. However, teachers were also permitted by Oikos to consume a certain portion of the vegetables in their own lunches:

Roberts: What if the teachers eat garden produce for school lunch?

Oikos garden coordinator Claudia Bugiardini: Then it’s fine. If a school is 500 students and there’s ten teachers and the teachers eat part of the produce it’s okay.

Roberts: The teachers at Fadhili said that it was an incentive for them to do work in the garden at the school. What is Oikos’ stance on this?

Bugiardini: We think it’s fine. ... It’s an extra plus that the teachers get it and they stay in the schools. They are more willing to stay in areas where they have access to decent fresh vegetables rather than being in a place where there is not.

Although Oikos’ school garden policy indicated that teachers were not supposed to use school gardens for their personal consumption or benefit, it is clear from this instance that Oikos acknowledged that this was not always the case and allowed this behavior to continue.

Another Oikos objective was for the students to learn how to apply organic and modern agriculture methods at school and at home in order to improve the health of children and their families. What knowledge was transferred from students in school gardens to parents and how this affected home garden practices will be discussed later in this chapter. In addition to families learning how to use sustainable agriculture methods

⁵³ From interview with Oikos school garden coordinator.

such as how to apply organic pesticides and techniques for reducing water usage such as drip irrigation, Oikos sought to promote positive views about the importance of growing and consuming particular crops that are nutritious and/or drought resistant. By doing so, Oikos hoped that students would carry out growing their own gardens at home.

As stated earlier in this chapter, input was provided from the FPS primary teachers and the Fadhili hamlet community during the initial meetings about which types of seeds would be planted. During a meeting held with the parents' and teachers' committee, they allowed the committees to select seeds to be planted in the FPS garden on the basis of experience, taste, and preference. As indicated, Oikos guided this selection so that crops were chosen that were suitable for growing in the area while trying to avoid crops that have big markets out of the fear that teachers would sell them. However, by guiding this process to the extent that they did, Oikos may have inadvertently damaged their ability to achieve their goals, as attaining community buy-in for the FPS school garden project may have been constrained due to Oikos' refusal to grow tomatoes, the most popular crop in the region.

Also, as indicated, FPS teacher garden coordinators received instruction by staff from the AVRDC and the Tanzania Agriculture Association, which centered on how to plant a variety of different types of plants and use organic farming methods in the teacher trainings held at the Oikos training centre above Mchanga. Despite the community's clear preference for some crops over others, certain seeds with higher nutritional quality were promoted and distributed by the AVRDC during these retreats. One example is the bambara groundnut, a legume with the highest protein content (Mulila-Mitti, 1997). Drought resistant seeds were also promoted and distributed, including amarands, African

nightshade, varieties of beans, and sunflowers that grow in three months. At the training the teachers were given training in how to plant the different types of seeds, as indicated by the Oikos school garden coordinator:

[At the training the teachers] study practical examples. They have general practice in Mgamia Primary School. We use the garden as a practical field. The variety of seeds that they can plant is always touched by the trainings.

The FPS garden teacher coordinators and its cook were also trained on the importance of not overcooking vegetables in the school lunch. The reason given by Oikos staff for providing this training was in order to maintain the nutritious qualities of the vegetables so that students would be healthier and more productive in their school subject studies.

At the end of the training, the teachers were given packages of seeds. The teachers were expected to lead the students in growing the different varieties of seeds at their schools. It should be noted that this section demonstrates the expectations for the teachers' behavior and the intended outcomes for the community. However, observations and interview responses will be included later to show the actual outcome.

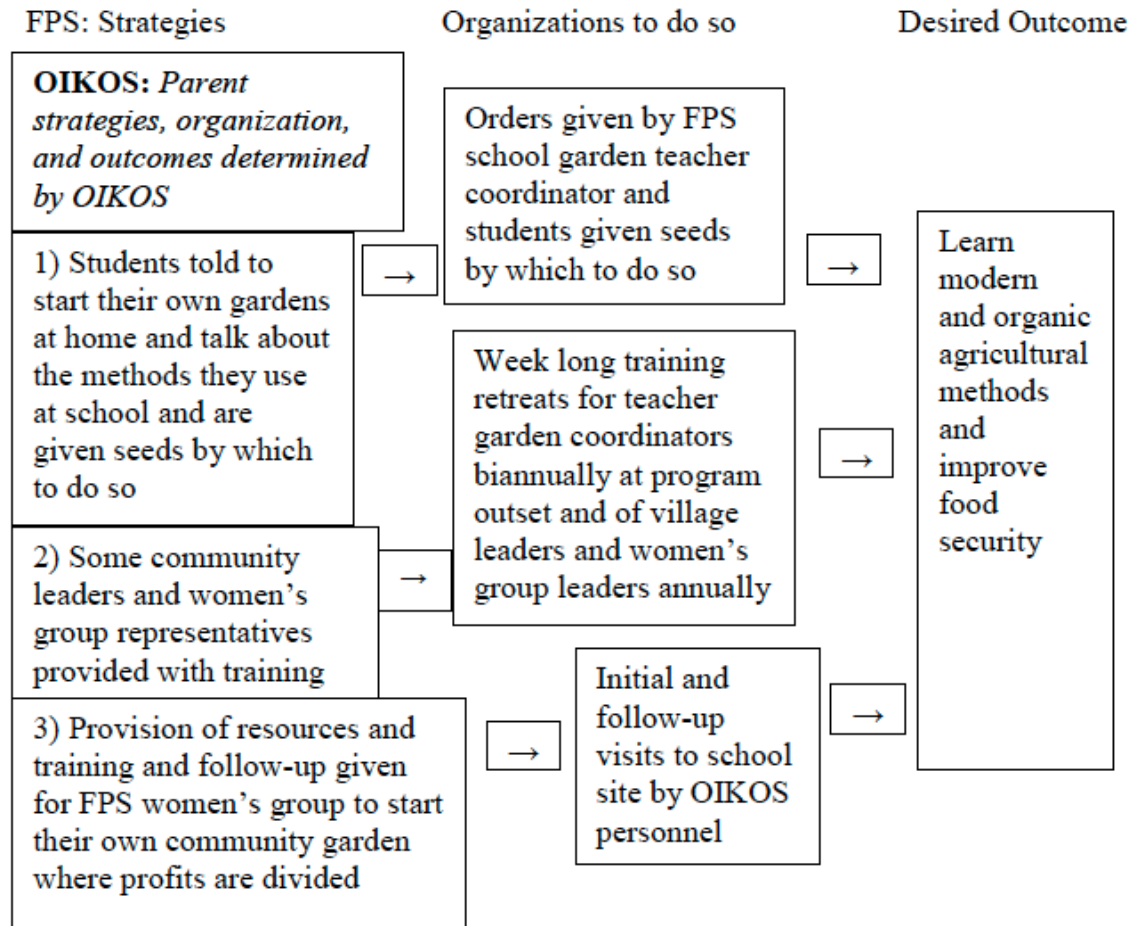
Chains to Change Agricultural Knowledge and Practice of Adults

The Oikos-supported program had the main objective of influencing change amongst adult villagers in order to encourage the application of sustainable farming methods (see Figure 7). Training of teachers and adult villagers was the primary approach utilized by Oikos to achieve this goal. A secondary strategy was through the diffusion of information from students to their parents. As indicated previously, follow-up visits where technical support was provided as needed were organized, and Oikos

utilized its training centre for weeklong retreats in order to instruct community members to carry out this objective.

Figure 7. Chain of Influence for Adult Villagers in FPS Community

Goal: *Change agricultural knowledge and practice of adult villagers in sustainable agriculture.*



In Figure 7 there are three chains, all which endeavor for villagers to learn modern and organic agricultural methods so as to improve food security. The first chain endeavors to do so by having FPS teachers mandate that their students initiate household garden projects. The second chain is designed to encourage desired outcomes through week-long training retreats for teacher garden coordinators as well as community and

women's group leaders. Finally, the third chain focuses on providing garden resources, training, and follow-up support to the FPS women's group by Oikos staff.

Through use of these chains, Oikos enables parents to do the following:

- (a) grow healthy garden produce that can improve nutrition through consumption by their communities and their children;
- (b) increase yields by learning and applying the appropriate spacing between garden crops; and
- (c) improve long-term sustainability through using natural pesticides and fertilizers.

In addition to providing technical support and input to the school garden and women's group programs at FPS, Oikos endeavored to influence change through selecting community leaders to attend weeklong retreats held at the Oikos training centre above Mchanga. It was the aim of Oikos for these community members to teach these skills to others when they returned to their village.

The nature of the instruction at the training centre was designed around having participants directly apply agricultural skills in hands-on work. Training was given on how to apply modern agricultural methods in their communities, such as measuring the appropriate distance between the planting of seeds in order to increase yields and using drip irrigation systems so as to reduce water usage. Cost-effective methods for making organic fertilizer through composting were taught.

Oikos also tried to get parents to learn agricultural methods through diffusion of students to their families and a garden run by an FPS women's group located behind the school. It was Oikos' aim for these students to influence change in their households through disseminating the agricultural knowledge they gained in the program. Alongside

the school gardens, there were additional plots of land allotted to women's groups for planting their own community gardens that were shared between members of the women's group. Unlike the school garden program at FPS where teachers were forbidden to sell produce, participants in Oikos women's group garden at FPS were permitted to vend their produce on the market to make a profit which would be divided amongst the participants in their group.

Constraining Factors of Oikos Project at FPS

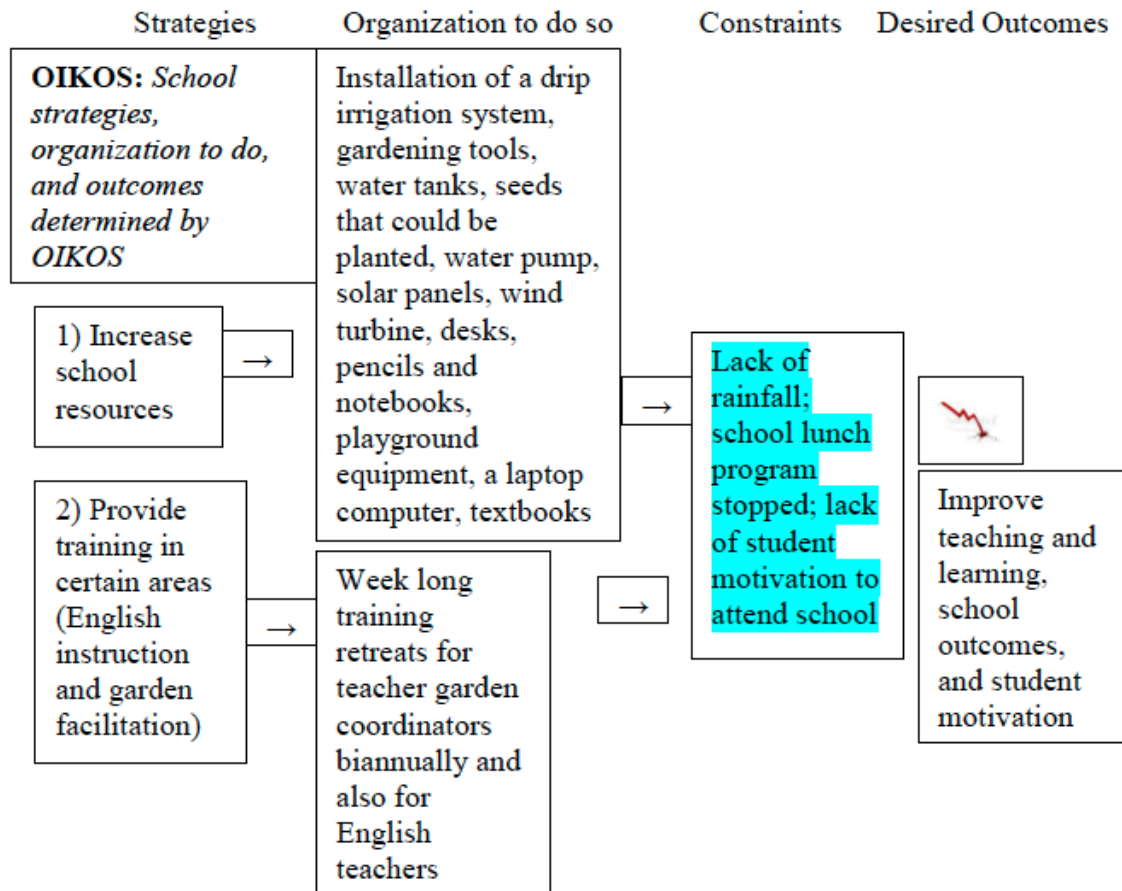
During the research I conducted in the FPS community, I observed that the project had made only scant progress toward attaining its central goal of improving nutrition within the community and encouraging the adoption of sustainable agricultural methods. The constraints shown in Figures V through VII represent the major challenges to the objectives of the donors for improving instructional quality at FPS.

Constraints at School Level

Figure 8 reproduces Figure 4, "Chain of influence for FPS school," in its entirety. However, the constraints for the project are also included in the figure. When the constraints caused the implementation of Oikos's intended project objectives to fail, they have been shaded with the color blue. For example, in both chains that sought to improve teaching and learning outcomes and student motivation, the links in the chain did not work as intended because of environmental conditions.

Figure 8. Constraints in Chain of Influence for School in FPS Community

Goal: *Change teaching practice and student knowledge and attitudes*



Explanation of the constraining factors for Oikos program objectives at FPS.

The main objectives of Oikos' school-related work at FPS was to improve teaching and learning, school outcomes, and student motivation (see Figure 8). In my research conducted in the FPS community, however, I found little evidence that these factors had been strengthened though Oikos' involvement at FPS. One major constraining factor reported at FPS was the environmental conditions faced when farming in the community and especially the drought during the rainy season of 2012. Other factors constraining Oikos' objectives of improving teaching and learning quality were the instructional habits

and practices adhered to by FPS teachers and the failure of Oikos to address these. The factors that address the constraints for teachers and students will be explained in later sections below.

In my interviews in northern Tanzania, lack of rainfall was a common challenge reported by farmers. Adult interviewees spoke to the obstacles faced in farming in recent times in responses similar in likeness to this excerpt below, from an interview with a mother in Ekundu River in the Arusha region, Elizabet Godwin:

The rainfall is much less now. When I was a child, we had eight months of rain [in Arusha region]. Nowadays there is only some rain in the rainy season from February to March and some in September.

When I returned to the FPS community in Mchanga during the middle of the rainy season in the month of April, I found that the Fadhili hamlet community faced this same challenge:

Prior to my initial visit to FPS, the Oikos school garden coordinator reported that the school had one of the most effectively-run garden programs at any of their 22 schools. My initial visit to the site subsequent stay in the community for the span of six weeks supported this assertion. However, when I revisited the FPS community during the rainy season in March to April 2012, I observed that the corn crop of all of the farmers who did not have irrigation canals flowing from the high altitudes of Mount Meru had withered. At FPS, their garden cultivation plot consisted only of dried dirt, aside from a small nursery 10 x 5 meters where they were attempting to cultivate kale seedlings. FPS teachers stated that the only crop that they had been able to plant in their school garden

was kale because this was the only plant that was not eaten by the birds due to its darker color.

It was reported that the implementation problems in the FPS garden were the result of the school's lack of access to a local water source (refer to the section of Figure 8 shaded with the color blue under "constraints"). Without permission to do so, farmers upstream had rerouted the water pipe running to FPS so that only their own fields could be watered. This water pipe had been installed by Oikos for its usage by FPS for the cooking of school lunch and garden activities. Since these farmers diverted the source of water for FPS, the FPS drip irrigation water tank that Oikos had installed could no longer be filled. This meant that a vegetable garden could no longer be grown by its students. Nonetheless, the year VI FPS students still diligently carried out the watering of the school's fruit trees in the back of the school. This was because in the morning the students were each required to bring three-liter containers filled with water, which they poured over the fruit trees.

At the initial meetings with Oikos, the FPS school committee had agreed that parents at FPS would be required to contribute two *debe* (bushels) of corn and one *sado* (two liter container) of beans two times per year. However, another effect of the drought was that the school lunch of *makande* (a hot dish of maize and beans) was no longer being served at FPS. In November of the previous year, I observed that FPS parents had been able to contribute the required corn and beans sufficiently for the second semester of 2011. However, the FPS teacher lunch coordinator, Judith Urasa, stated that the parents were not able to contribute beans and corns sufficiently for the first semester of 2012 and

reported that there was a declining enrollment at FPS because of the failure to continue to run its school lunch program:

The corn that [families here have] planted has dried up. The beans that were planted have dried up. Only the fields [in Mchanga] that are irrigated [where mostly tomatoes are grown] will be harvested. Parents are carefully storing what they have so as to try to have enough food to feed themselves and their families. At school we only have enough corn and beans to feed the students for one more week. We will do this when they return after [Easter] break. The students now come to school expecting school lunch. But they do not get it. Many students are now dropping out of school.

This quote illustrates how the school garden and feeding programs facilitated by the school were dependent on and could be entirely sabotaged by not having a sufficient source of water.

While one major achievement that the Oikos program reported in its 22 schools was improved school attendance of its students, Oikos later clarified that this was the case in only four of its 22 schools. They found that improvement of school attendance coincided with how actively the school was involved in the successful implementation of school feeding activities. This included schools where kitchens were constructed, school meal plans were promoted, and where training courses were provided to teachers and parents (Istituto Oikos, 2012). They attributed the trend of improved enrollment to have occurred in four of its schools due to school meal plans being adopted within six months of the beginning of the intervention and because *makande* was served daily to students. These findings help to explain how the lack of water access at FPS for garden activities

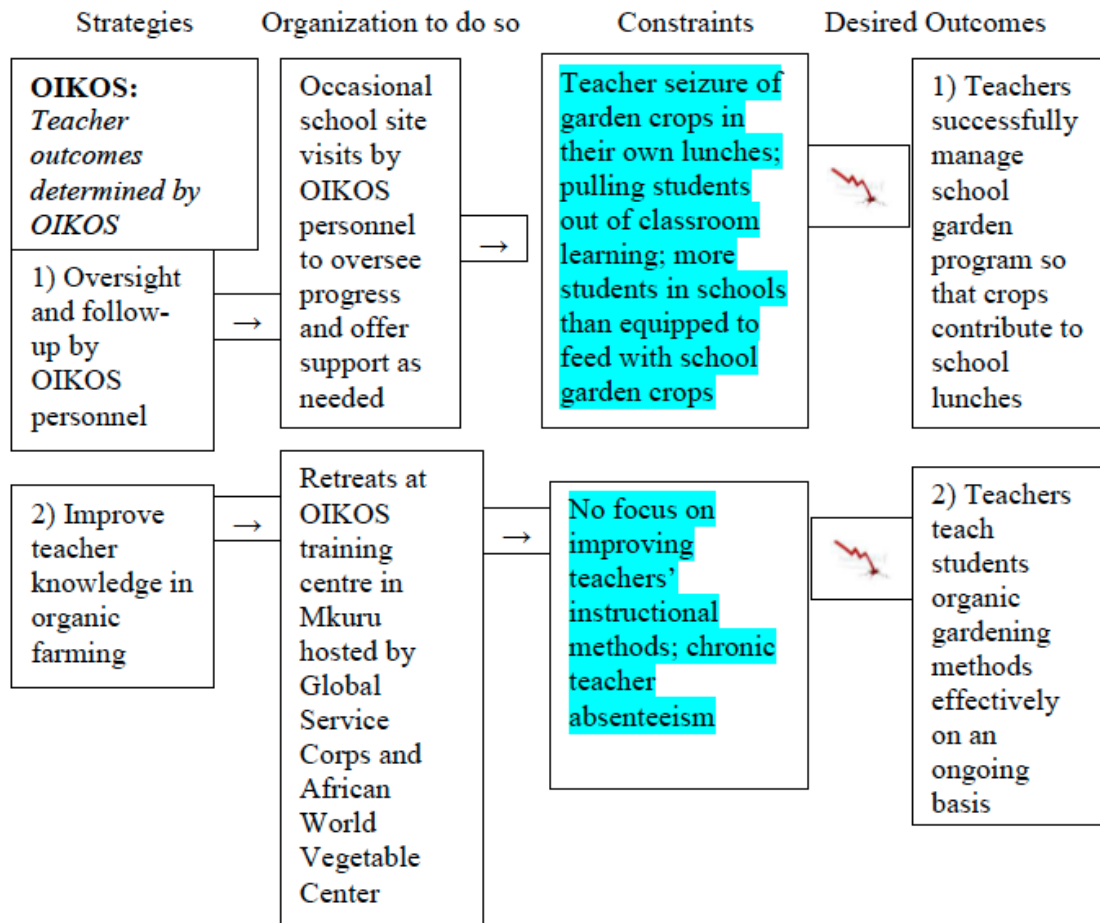
and the inability of the teachers to run its lunch program negatively influenced the attendance of students at FPS.

Constraints at Teacher Level for FPS

The diagram in Figure 9 is the same as Figure 5 “Chain of Influence for FPS Teachers” at the beginning of this chapter, with the only difference being that the constraints for the project are included here. In the first chain, the desired outcome of teachers successfully managing school garden programs did not go as intended because of teacher behavior and high enrollment numbers of students. In the second chain, the desired outcome of students being taught organic gardening methods did not go as intended because of problems with teacher accountability and the lack of focus on changing teacher pedagogy.

Figure 9. Constraints in Chain of Influence for Teachers in FPS Community

Goals: *Change teacher practice, knowledge, and attitude in teaching agriculture*



In interviews, parents and leaders in both communities generally recognized that the five teachers who managed farm activities at each school, three at FPS and two at NPS, were hard working. However, during my time spent at both primary schools, I observed that other, non-farm related teachers at these schools commonly did not carry out their own classroom teaching responsibilities because they failed to adhere to their teaching schedule. With regard to the constraints that teachers faced in their jobs, the high number of class periods they were required to teach and the large class sizes amongst the rural primary school teachers at both FPS and NPS were reported by

teachers to be major challenges that impeded their ability to adhere to their assigned teaching schedules. In interviews at both schools, they constantly compared the hardships that they faced as rural teachers with the lesser workload of urban state primary school teachers. Teachers at both schools expressed major frustration in having such demanding job responsibilities.

These sentiments and beliefs were likely to be contributing factors to the development of a culture of recurring absenteeism amongst teachers at both schools and their adherence to a teaching protocol of order giving. Although I observed some teachers to spend time selectively with students in farm and classroom learning activities, the lack of consistent technical support in influencing teaching pedagogy was another factor which impeded the program goals for teachers of managing effective school garden and lunch programs (Oikos) and changing teacher practice in facilitating school farm activities (4-H).

In the two initial years of the Oikos school garden projects, the nutrition of students was not found to have improved significantly by the Oikos project manager within its 22 schools (A. Filipepi, November 23, 2011). One major obstacle that I observed preventing progress in this area was the FPS teachers' adherence to the practice of eating the majority of the school garden produce themselves and pulling students out of class to prepare lunches (see Figure 9 in shaded blue box under "constraints"), and this behavior also served to negatively impact Oikos' goal of improving agricultural knowledge.

Teacher absenteeism from teaching duties at FPS. A major barrier preventing student learning in agriculture and also other school subjects at FPS was that teachers

commonly left their classrooms of students alone and instead they remained sitting at their desks in the teachers' office. For example, the morning schedule on a particular day I was observing at FPS was the following for year VI students: Swahili from 8:00 a.m. to 8:40 a.m., math from 8:40 a.m. to 9:20 a.m., and English from 9:20 a.m. to 10:00 a.m. On this day, at 9:34 a.m., the students had only received math instruction. Although in interviews teachers and students claimed that the teachers placed a student in charge of monitoring student behavior when they were not present—the students claimed that student monitors wrote the names of misbehaving students on a piece of paper and turned this paper in to the teacher so that off-task students were later punished—during my time spent at the school I did not observe teachers following through after receiving these lists.

In order to gain a better understanding of how time was allocated by FPS teachers during the school day, I collected data on the activities of a few teachers on certain days of school. On the first day, the two teachers I selected were Judith Urasa and Robert Kiwelu. I selected Urasa because she appeared to be one of the most dedicated teachers at FPS and appeared to be always engaged in many activities around the school. I selected Kiwelu because he appeared to be always missing from his classroom teaching duties.

Figure 10. November 16, 2011: What Were Two FPS Teachers Doing?

| Teacher Kiwelu |
|------------------------------------------------------------------------------------------------------------|
| 08:00 a.m.: In teacher's office chatting |
| 08:30 a.m.: In teacher's office calculating money collected for end of the year exams |
| 09:00 a.m.: Same |
| 09:30 a.m.: Went out to watch the workers installing the wind turbines behind the school |
| 10:00 a.m.: Same |
| 10:30 a.m.: Same |
| 11:00 a.m.: In teacher's office grading year V math exams |
| 11:30 a.m.: Same |
| 12:00 p.m.: Same |
| 12:30 p.m.: Went out to watch the workers installing the wind turbines behind the school |
| 01:00 p.m.: Same |
| 01:30 p.m.: Began digging a ditch from the school to the wind turbine so as to connect cables later |
| 02:00 p.m.: Delegated the responsibility of digging the ditch to the year VII students |
| 02:30 p.m.: Ate lunch with other teachers |

| Teacher Urasa |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 08:00 a.m.: In school garden telling students to finish up garden work |
| 08:30 a.m.: In teacher's office with a list of students who have contributed beans and corn for school lunch for the following year |
| 09:00 a.m.: In teacher's office inspecting exams for her class that teacher Emanuel Stanley Urio brought |
| 09:30 a.m.: In the kitchen, inspecting year VI girl students who are cooking, shows them how to change the water when they wash the spinach leaves and instructs them to hit the spinach against the side of the bucket in order for the water to drain from the leaves |
| 10:00 a.m.: In kitchen still inspecting school lunch |
| 10:30 a.m.: Out back, inspecting the school garden inspecting with teachers Emanuel Stanley Urio- and Gipsam Mlay. They are planning what to do before next year and checking drip irrigation system |
| 11:00 a.m.: In kitchen watching over year VI girls who are cleaning beans |
| 11:30 a.m.: Inside teacher's office drinking tea |
| 12:00 p.m.: Instructing year V students to take <i>gogwe</i> (African eggplant) seeds out of burlap bag and place them on another burlap bag to dry in the sun in front of the teachers' office. She then enters teacher's office and scolds a student who did not pay for school lunches for the entire year (Later this student's mother is brought in and a strong discussion ensues.) |
| 12:30 p.m.: In kitchen, monitoring distribution of lunch food, instructs helpers to only give each student a spoonful each |
| 01:00 p.m.: In kitchen preparing lunch for teachers in the side kitchen of rice, beans, and spinach. When asked she tells me that the cook Isaac has a lot of work to do, and she is helping him out |
| 01:30 p.m.: Same |
| 02:00 p.m.: Same |
| 02:30 p.m.: With other teachers eating lunch with the construction workers. |

The data show that Robert Kiwelu was not engaged in teaching his students during the times the data was collected. Although Judith Urasa was not engaged in

teaching activities either, she was involved in other responsibilities that she had at school as the FPS school lunch coordinator. For example, she was responsible for supervising the preparation of school lunch, helping other teachers to oversee school garden activities, and inspecting which students had contributed corn and beans for the school lunch the next semester.

The same data was collected on a different day at FPS. Two different teachers were selected. The data shows that teacher Emanuel Stanley Urio was not engaged in teaching his students at the times the data was collected. Instead he was sitting in the teachers' office grading exams, preparing exams, or talking on his cell phone. Additionally, at 9:30 am, I observed him to be out surveying his own cultivation plot adjacent to the school where he was farming tomatoes. The data also shows that teacher Florah E. Makyao did not teach students on this day, either. Instead, she tended to other duties such as supervising students who were preparing food for school lunches, engaging with Oikos staff who came to do work on the wind turbine and water tanks at FPS, and maintaining records of which students had still not taken end-of-the-year exams and contributed beans and corn for the school lunch.

When FPS students were left unsupervised by teachers in their classrooms, whether they did their assigned schoolwork independently in the classroom depended on if the teacher gave students work to complete. When the students were given assigned work to complete in school subjects such as math or Swahili then they were expected to complete the work that they had been given. I observed the following as the predominant practice at FPS: The teacher tended to remain outside of the classroom while the students worked independently. Later the teacher stopped in the classroom to collect the work.

Then the teacher went to the teachers' office to grade the work. During scheduled classroom time when teachers left the classroom, a few students diligently did their work while other students talked with each other, played games, or sat at their desks quietly. In garden activities I also found that teachers often walked away from overseeing student work that they assigned. For example, one day I observed that teacher Florah E. Makyao asked a group of girls to help with the weeding of the rows of greens planted in the garden. After she shouted her instructions at them, Makyao walked away to the front of the garden and did not look or come back. I then realized that teachers Urrio and Makyao were most likely avoiding the garden work in order to indirectly place me in charge of their teaching responsibilities in the garden. This was because I was in the garden every day at the school, and the teachers had become accustomed to me. They preferred for me to do their work instead of them.

In my interviews, I learned that one factor that helped to explain the FPS teachers' behavior was the fact that they were free to take their own position on attendance. They were able to do so because the head teacher only gave them warnings if they did not attend or were late; teachers were not penalized for failure to adhere to their given schedules. In my talks with the FPS head teacher, Gipsam Mlay, he acknowledged that teachers at his school were not able to fulfill their regular classroom teaching responsibilities.⁵⁴ But he could not hold teachers accountable for their inability to adhere to their schedule. In his opinion, this was because he risked losing his teachers, as demonstrated by the following statement:

⁵⁴ See chapter 4, page 39.

When FPS teachers are not teaching their classes, I do not punish them. I give them a reminder about when they were late. I have to be careful because if a teacher [at FPS] leaves, then the district will not send us another teacher to replace them. There is already a teacher shortage here at FPS compared to urban schools.

The fact that the teachers could not be replaced for poor behavior created a situation where the head teacher was powerless to enforce standards about attendance, which contributed to the constraining effect of teacher absenteeism.

Pulling FPS students out of classroom learning. Another obstacle that prevented the Oikos objective of students being able to gain agricultural knowledge in classroom learning was that some students were consistently pulled out of the classroom in order to conduct work around the school. In particular, girl students in years IV through VI were often pulled out of their classroom to help prepare lunch and later to clean the pots used in cooking. The student helpers that were pulled out of class to work in the kitchen were typically girls. They left their classrooms to help the male chef. In interviews with teachers, this practice was justified because in Meru culture females, not males, were expected to carry out work in the kitchen.

Teacher expropriation of school garden vegetables for their own benefit. Another barrier that impeded Oikos' program goal of improving student nutrition was the seizure of garden crops by teachers for their own lunches (see again Figure 9 in shaded blue box under "constraints"). During the first three weeks of my time spent at FPS, I observed that the year VI students involved in school garden work at FPS were not provided with garden produce in their lunches. They had recently planted garden

produce at the beginning of October, and during the month of October the students watered and weeded the garden as well as transplanted garden greens in new rows in order to expand it.

They were able to water their garden because a pump had been built by Oikos. After they finished their morning work from 7:00 a.m. to 7:45 a.m. daily, water from the hose was filled into one of the large water tanks through a hose connected to the pump. A black tube ran out from the water tank that was connected to a drip irrigation system in the garden.

In spite of the FPS students diligently conducting work each morning in the FPS garden, I observed that the garden produce was eaten mostly by teachers. Year VI girl students were ordered to pick leaves from the lettuce, cow peas, and African nightshade in burlap bags and bring this produce to the school cook. They also harvested okra from the garden. The girl students only picked leaves from the garden crops every five days. On the days they did so, a group of the year VI girls was later pulled from their regular classroom activities by the male cook in order to wash and cut the garden greens. The cooked garden greens that the year VI girl students picked were served to the FPS teachers in their own school lunches on a regular basis. This excerpt from my field notes exemplifies this occurrence:

At lunch today I observed that the year IV students had been served their typical lunch of *makande*, a stew of corn and beans. They waited with their meals finished and their plates empty hungrily eyeing the nearly empty pot of teachers' food that had been cooked over cinderblocks to the side. One of the boys had managed to grab a remaining mouthful of beef that had not been eaten by the

teachers, and he hungrily munched on it. Inside the teachers' office, the teachers insisted that I eat the food that they had been served in their separate pots. This consisted of rice, a beef stew, and steamed "Chinese" crunchy greens. The teachers told me that the "Chinese" greens had come from the garden. I had not noticed any of the year IV students eating any of this garden produce in their school lunches.

During the fourth and fifth week before school was closed on November 25th, 2011, I observed that teachers were consistently fed *mboga za majani* (collard greens) daily in their lunches. In contrast, all the students at Fadhili Primary School were fed only each given a meager spoonful of garden greens in their school lunch of stewed beans and maize, and this happened only three times when I was there.

Large student enrollment at FPS. Another reason for the difficulty in providing the food produced in the FPS school garden to all students was that there was a large student enrollment at FPS, 362 students total (see Figure 9 in blue box under "constraints"). Their small ½ acre garden plot could not provide enough food for all of the students to be fed year round. As indicated, the families of students were required to contribute two *debe* (bushels) of corn and one *sado* (two liter container) of beans per semester to supplement the farm.

I interviewed many elderly Tanzanians, and this school lunch supplementation was in contrast to the experiences of many elderly Tanzanians reported experiences from when they were students. From them I heard that during the period of Self-Reliance in Tanzania many primary schools were reportedly able to feed all of their students. The following is an excerpt from an interview with the chairperson of a primary school in

Ekundu River, Josephat Mbise, who was formerly a teacher in southern Tanzania detailing a successful school feeding program in southern Tanzania during the period of Self-Reliance, which was able to provide food to all of its students year round:

In the primary school I taught for 12 years in Mtwara Region [in southern Tanzania], and there were four acres at the school where we harvested corn, peanuts, and rice. We also had two acres of millet. We ground the corn and millet and served millet porridge in the morning and ugali for the midday meal. There was a lot of food. All of the teachers and students ate. There were 315 students.

There was enough food for all of us for the year.

However, in recent times, the ability to run a successful school feeding program at schools in Tanzania that would be able to feed the entire student population was made challenging because of the substantial enrollment expansion of Tanzanian primary school enrollment and also because of the lack of rainfall in recent years.

Teacher training at Oikos training centre does not include capacity-building in active instructional methods. In the training provided to teachers and community leaders by Oikos at their training centre, I learned that the nature of the instruction that teachers were given was providing information to them about organic agricultural methods. However, there was no emphasis on how to teach students about farming with appropriate pedagogy (see section "Explanation of Chain of Influence for FPS teachers" above for a specific example).

During the training provided, there was no time allocated to training teachers about using different instructional approaches with students, such as experiential education, cooperative group management, or active learning. As will be discussed in the

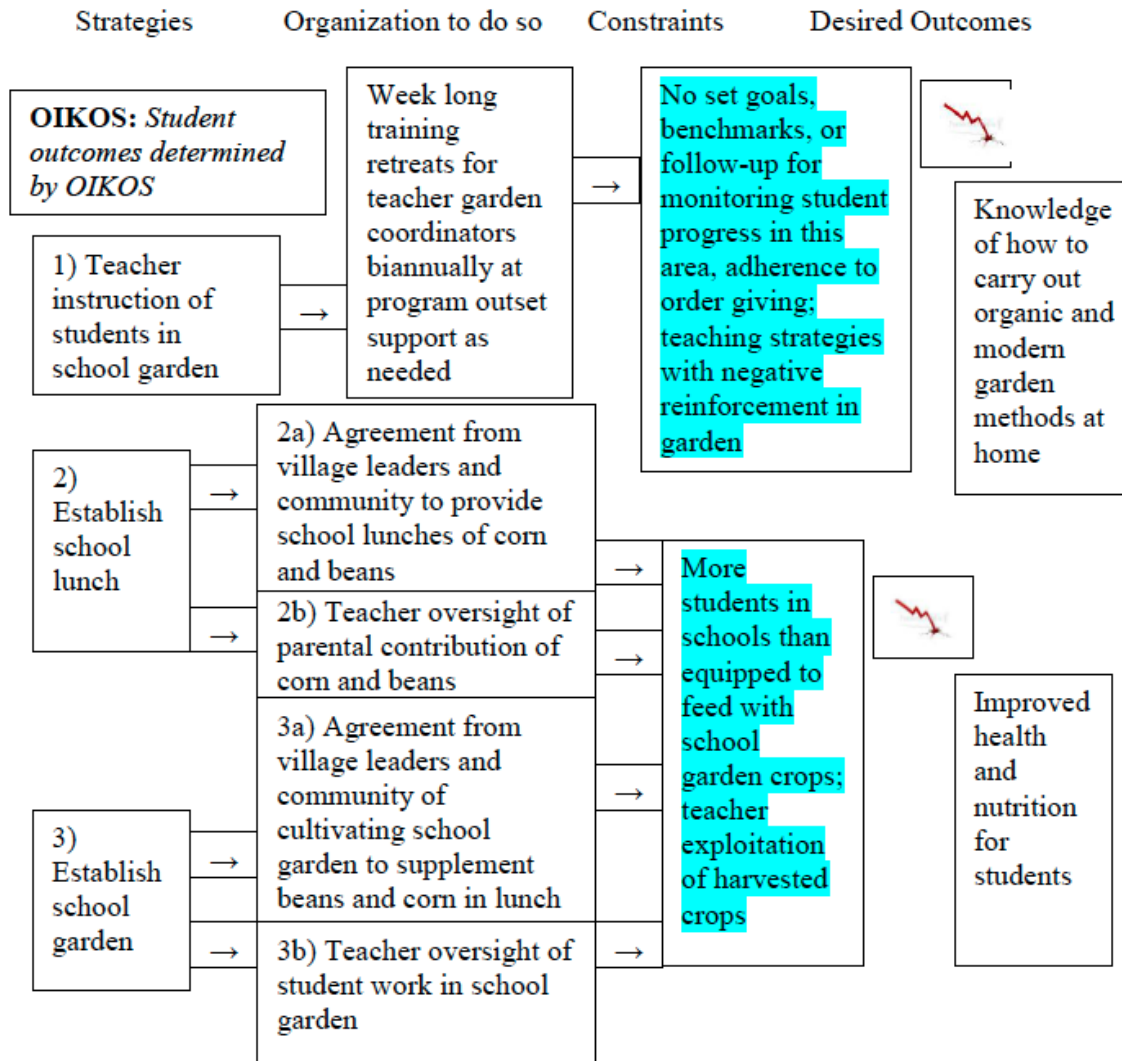
section below, one consequence of this lack of pedagogical instruction was that FPS teachers relied on the method which they were using, namely just giving students orders to follow in their school garden work.

Constraints at the Student Level at FPS

Again the diagram in question, Figure 11, is the same as the earlier Figure 6 “Chain of influence for FPS students,” except that the constraints for the project are included here. In the first chain, the objective of students carrying out organic and modern garden methods at home was constrained by not having measurable goals or data collected on student progress or information about the use of teacher pedagogical strategies centered on negative reinforcement. In the second and third chains, the objective of improving the health and nutrition of students was constrained by high student enrollment numbers and teacher appropriation of garden crops, as delineated above.

Figure 11. Constraints in Chain of Influence for FPS Students

Goal: *Change student knowledge, practice, and attitudes in carrying out agriculture*



The focus of the Oikos training at the Oikos training center I attended was on disseminating agricultural skills to teachers and community stakeholders. The instructional methods used by FPS teachers were limited to order-giving in the garden, since teachers were not given instruction in how to facilitate school garden work using alternative instructional methods. A major reason for adherence to order giving that was given in interviews with parents and teachers was that there are historical roots of “order

giving” in the Tanzanian educational system. For example, an FPS mother from a single mother household, Anenyise H. Urrio, stated that order giving is an accepted method of instruction in Meru culture. She justified the need for teachers to apply this method at school because of her view that Tanzanian youth are not willing to work unless required to do so:

Students need to follow orders. Students [here] are lazy. In Tanzania, we are accustomed to being given orders. In Meru culture this is what we do, too.

The quote above illustrates that order giving was recognized as being the most effective method in the Fadhili community in terms of accomplishing a given work agenda and in fostering work ethic among students. The FPS head teacher, Gipsam Mlay, expressed his view that Tanzanian students nowadays desire to work less due to exposure to mechanized methods of work used in higher-income nations. He also viewed student work in garden activities as being beneficial to students for the opportunity to learn the value of exerting hard work. Further analyses of the constraints in the chain of influence for teachers in FPS community will be included in the subsequent chapter comparing the Oikos program to the 4-H-supported program at NPS in Nyota village, Kilimanjaro Region.

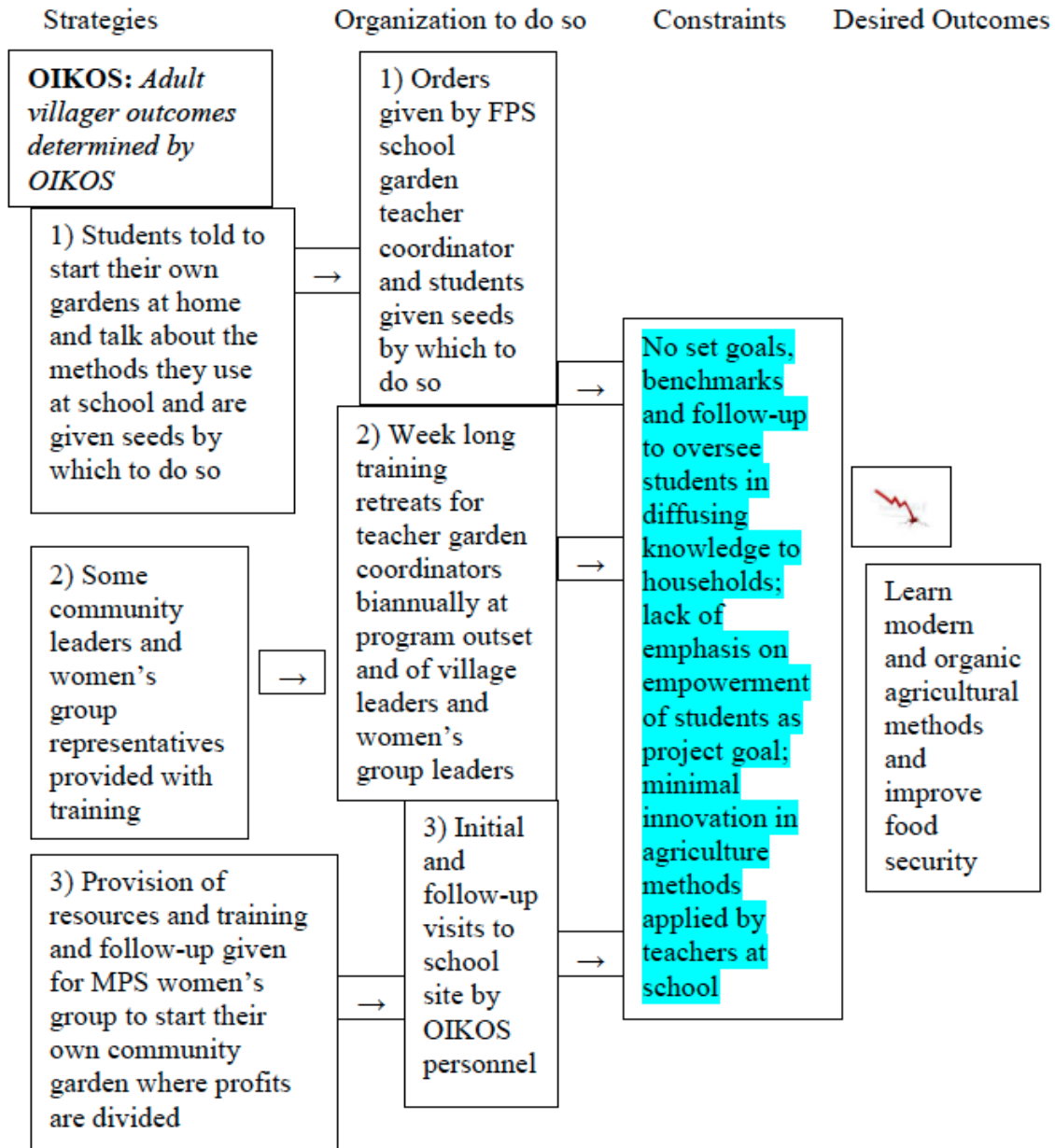
Constraints at the Adult Villager Level at FPS

For the three chains in Figure 12 (corresponding to Figure 7 but with constraints added), the objective of villagers learning modern and organic agricultural methods and improving food security were constrained because of the lack of feasible and adequate strategies for student diffusion of agricultural knowledge to their households, the lack of emphasis on the empowerment of students in the garden, and the minimal innovation of

agricultural methods applied by teachers.

Figure 12. Constraints in Chain of Influence for FPS Adult Villagers

Goal: *Change parental agricultural knowledge and practice in applying sustainable agricultural methods*



During my time spent conducting research at FPS, year VI students at FPS and their teachers reported that 13 of the 36 year VI students had initiated their own gardens

at home. The quote from an interview with an FPS female teacher from the Chagga ethnic group below, Judith Urasa, is an example of what all of teachers at FPS reported:

One of the goals of the [FPS] school garden is to have students learn to do garden work at their homes. Almost half of the [year VI] students do this.

In my discussion with these students who claimed to have done so, they stated that they had begun their gardens during this academic year after the Oikos school garden program began at FPS. Many reported that they had chosen to start their own gardens because they were told to do so by the female teacher garden coordinator at FPS. This was later confirmed by her.

In my follow-up visits to the households of these 13 year VI students who claimed that they had initiated their own gardens, I found that they grew similar crops to what was grown in the school garden, such as kale, African nightshade, and lettuce. This was of great importance because it suggested that they were diffusing knowledge learned at school at their homes. These students unanimously stated that they had chosen to start their own gardens in order to sell their produce and purchase school supplies. They also allowed for a portion of their harvest crops to be consumed by their household. Below is an example of the typical reasons they gave for why they decided to grow their own gardens, shared by a year VI female student from the Chagga ethnic group, Cynthia Makata:

I learned to grow kale after I learned how [to do so] at school. I like to cook it with carrots. I grow onions because they can be used for cooking and selling. I know how to grow onions because I learned from my grandmother. I began

growing these vegetables because my family was not growing them. I grow them in my garden in order to eat better food and also to sell to make a profit.

These students and their families stated that vegetables grown in students' home gardens were different from the vegetables that they traditionally grew on their families' farms. However, in my interviews with parents of students involved in home gardening, I found no evidence of sustainable agricultural methods being applied that students had learned at school, such as reducing water usage through using a drip irrigation water tank or making organic pesticides of cow urine and ash in the manner that they had been taught at school.

Only two of the year VI students I interviewed, the boys, Josephat Kamnde and Frank N. Urío, claimed that they had applied innovative or sustainable agricultural methods in their garden that they learned at school. Josephat and Frank contended that they made an organic pesticide at home and applied it in their own garden space. However, their parents reported that Josephat and Frank had not taught their families how to replicate this method. Their parents expressed disappointment that Josephat and Frank had not done so because they themselves desired to learn organic methods for applying pesticides in order to save money by not having to purchase store-bought pesticides (see Figure 12 in blue box under “constraints”).

One reason FPS parents gave for not adapting the use of drip irrigation tanks in their households was because they could not afford to purchase large plastic tanks or the tubes running down the rows of their fields. In my own experience visiting other Oikos school garden projects, I had also noticed that the drip irrigation units were not being used because some of the pieces of tubing had broken. While at FPS teachers diligently measured the exact distance where the water dripped out of the tubes and had the students

plant the seeds at these points, in school visits to other Oikos school gardens in the area I found that this was the only school which was using its drip irrigation system effectively. The garden coordinator for Oikos also disclosed to me that she felt that Oikos had been mistaken in providing the drip irrigation systems to its schools because of the difficulty of using such systems regularly.

Scant evidence was found that FPS teachers had experimented with growing drought-resistant crops at their school, either. Despite Oikos's provision of seeds of drought-resistant crops to teachers and villagers at the week-long retreats at their training centre, according to the Oikos school garden coordinator, teachers opted to not grow alternative crops at FPS nor at other Oikos schools (see again Figure 12 in shaded blue box under "constraints"). She reported that this was because they claimed that the culture of the Meru ethnic group preferred the taste of traditional crops grown in the area such as corn, spinach, and legumes such as cowpeas:

Roberts: During the discussions with community leaders during the planning phase for the FPS school garden, were drought-resistant crops distributed and was training provided about how to grow them?

Oikos school garden coordinator, Claudia Bugiardini: Yeah, amarand (*mchicha*) is one of them. Also, African nightshade. We gave them those kinds of crops. And bambara groundnut, we tried that. But they don't like it here. They think it is unsuitable and think that is poor society's food grown by people in central Tanzania. But it's the highest of protein of all of the legumes. You can eat the leaves. But they still feel that it's not worth it, and they would rather plant tomatoes if they can choose. And we gave them beans and sunflowers, but most

schools haven't planted yet. They are waiting for the big rains. We gave them a variety that grows in three months. They are very resistant to introduction of either new things or reintroduction of indigenous species. They feel that it is poor peoples' food, like African Nightshade.

The general failure of teachers to experiment with different varieties of crops that are not from their culture in Oikos' school garden projects suggests that alternative approaches may need to be explored for encouraging teachers to facilitate the cultivation of certain crops such as follow-up from Oikos staff to support teachers in doing so or having teachers work with students to gather data on the growth of particular crops, the duration of time before harvested, as well as the nutrition properties of a certain crop versus indigenous species.

In summary, there was scant evidence of *new* agriculture techniques being applied during my visits to the households of FPS year VI students nor in other Oikos school garden projects. My interviews with adult villagers and Oikos personnel confirmed this. The fact that many year VI students were initiating their own gardens underscores that the Oikos program was effective in raising awareness amongst community members about how to grow certain nutritious vegetables. FPS teachers accomplished this objective by encouraging students to grow vegetables in their own households and seeds were even dispersed by FPS teachers to some students in order for them do so. However, there were no set goals, benchmarks, or follow-up established by Oikos to oversee whether students were actually applying innovative agricultural methods in their households or teaching these skills to others. No evidence was found that technical

support was forthcoming from Oikos for students in diffusing this knowledge to their households.

Conclusion

The Oikos intervention used an innovative design by endeavoring to develop sustainable school feeding and garden programs where teachers, students, and communities actively participated in implementing the programs. However, the Oikos intervention might have created tensions by calling on teachers and students to allocate more time to preparing school gardens and lunches. Often teacher and student time was spent on lunch and garden preparation tasks in lieu of academic instruction. Some of the minority points of view to be discussed in chapter 8 indicate opposition by some community stakeholders to teacher and student time designated to work in this area in lieu of being taught school subjects during scheduled classroom instruction time.

A summary of the findings from the Oikos-supported school program at FPS in Mchanga in comparison to the 4-H-supported at NPS at Nyota village, Kilimanjaro Region is found at the end of chapter 7. Chapter 7 draws on data from chapter 6 to analyze the two different approaches of the donors, and it compares the views of villagers, teachers, and students about the impact of the projects in the two schools and communities.

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CHAPTER 7

Changing Expectations and Practices: The 4-H intervention

This chapter parallels the previous chapter on the Oikos project in that it follows the same structure, but it instead focuses on how the NGO 4-H sought to improve the quality of schooling and livelihoods in Nyota village with their targeted project. Like Oikos' strategies at NPS, a main approach of the 4-H program for accomplishing their objectives was through student participation in school farm and garden activities and the provision of training for teachers. These 4-H objectives reinforce the community expectations of school outcomes discussed in chapter 5, including generating school resources, preparing students to produce income in their futures, and providing an opportunity for students to learn how to work hard. The Oikos program also reinforced these same expectations, but with less weight on the last element in the previous list (student work ethic) because, unlike the Chagga culture of NPS, this component was less emphasized by the dominant ethnic group in the FPS hamlet, the Meru.

The 4-H intervention is also comparable to that of Oikos in that its intentions may inadvertently reduce the main expectation of the Nyota community and the TMEVT, which is for teachers to prepare students to pass national exams in year VII of primary school. This is because student and teacher time designated to farm activities was found to often overlap or even replace regular classroom instruction, and since farm activities were not tied to learning outcomes, this instructional time was lost. However, a major difference between the two interventions was that the Oikos program was more intense, since funding was only insured for two years. While, at FPS, concentration was placed

on building projects in addition to the school garden and feeding programs, at NPS, a major goal of 4-H was to create a sustainable program that, after the initial years of running with support from the 4-H headquarters, would be run independently by the teachers at that school with district oversight. 4-H placed the expectation on the district education officers and teachers at their schools to take ownership in facilitating programs at their schools. Oikos, on the other hand, sent their own staff to visit their schools, assess progress, and provide consultation.

The chapter begins by providing information about the objectives, foci, and history of 4-H followed by an analysis of the structure of the 4-H program at NPS. Like the previous chapter, the second part of this chapter centers on how the objectives of the 4-H-supported project fell short at NPS because of constraining factors. Comparisons between the 4-H program at NPS and the Oikos-supported program at FPS are drawn upon in these final sections in order to understand the reasons underlying the constraints facing such educational projects.

About 4-H

Since the beginning of the twentieth century, the United States Department of Agriculture's youth organization 4-H has endeavored to transform how school science is taught. The idea behind 4-H was to create an opportunity for practical and hands-on learning in order to connect public school education to rural life (4-H, 2010). Over the years, in Tanzania and throughout the world, this organization's main objective has remained the improvement of young people's learning. In Nyota village, the 4-H program challenges prevailing practices and expectations more than Oikos by endeavoring to accomplish this objective through teaching science using active learning

methods in after-school programs. Such programs have traditionally included—but are not limited to—student participation in the cultivation of agricultural produce on school grounds. An additional objective is for students to learn practical skills through real world experiences. This may include students gaining important skills and learning such as agricultural knowledge, the ability to apply the scientific method in a real world context, and fostering civic competencies that can contribute positively to their community, which may further improve the community’s economic development through the development and dissemination of innovative ideas. The organization asserts that through utilizing hands-on learning approaches, the “heart, head, hands, and health” of students are developed by the program because they “learn to do by doing” (4-H, 2010).

4-H in Sub-Saharan Africa

4-H became a global movement shortly after being created in the U.S. in the late 1890s (4-H History Preservation Team, 2013). With the objective of building a global 4-H network, 4-H efforts were initiated in Africa in 1962. Currently, its largest program is in Kenya, with more than 5,215 Clubs and a membership of more than 181,400.

In the SSA context, 4-H’s main goals are currently to alleviate poverty, develop leadership skills, and change the curriculum (Ncula, 2007). However, since the national curriculum in Tanzania is only permitted to be changed by the TMEVT itself, the 4-H programs in Tanzania can only impact curricular change in theory. Ostensibly, the 4-H programs in Tanzania address poverty alleviation by having students teach their families the agricultural skills they have learned from the program and also by raising income levels since the skills students gain are claimed to be useful for finding employment in their future years. The means by which 4-H endeavors to transform the curriculum

teachers use is by supplementing the national curriculum that teachers must follow in their classrooms with a hands-on, after-school garden program. 4-H rationalizes that teachers may choose to draw upon the school garden/farm when teaching school subjects such as math, science, and reading and may choose to implement activities where students become actively involved in learning through its use (Arusha District 4-H teacher coordinator, 2010).

Project Objectives

The following are the project objectives for each particular group of NPS stakeholders (schools, teachers, students, and adult villagers). These diagrams serve to compare the NPS groups (See Figures I-IV) and to illustrate the complex strategies the donors used for endeavoring to enact change. For each stakeholder, there are one to three chains detailing the different objectives, organization to enact change, and the intended outcomes.

Comparison of 4-H Project Objectives for NPS to the Oikos Objectives at FPS

A major difference between the donor-supported programs at NPS and FPS was that that the NPS school committee and its teachers decided the focus of the 4-H program at NPS. In contrast, the Oikos program had specific objectives that it set for FPS and its community to carry out. Opportunities for the FPS community and teachers to provide input into how their garden program was organized were limited.

This was much less the case at NPS. At NPS the community leaders and teachers were given permission to determine the focus of the 4-H projects that they desired students to carry out. In Maembe, Kilimanjaro for example, I learned that the focus of some of the 4-H clubs was on theatre, artisanry, or drum making and playing.

The NPS teachers and villagers chose to initiate an organic farming program because they hoped that in doing so they would improve the environmental conditions in their community in the long term. The expectation was that students would educate their households through the independent projects they carried out. This expectation for the program was a major change from the traditional schooling expectations highlighted in chapter 5 because it calls on students to play the role of being educators. Agricultural knowledge was also expected to be disseminated to households by village leaders, who were selected to participate in the training sessions held during the first six months of the club's outset by staff from the Kenyan Institute of Organic Farming (KIOF). The head teacher from NPS reported to me that the reason they chose this focus was because of environmental problems that farmers were now facing in Nyota village. According to him, there were no longer any waterways flowing down from Mount Kilimanjaro through Nyota village. He attributed the cause of this development to be deforestation. He also mentioned that soil quality was being damaged because farmers were relying on the use of store-bought pesticides, especially in coffee farming.

The focus of the 4-H program was decided after the NPS school committee met with its head teacher and teachers serving as agriculture coordinators at the outset of the 4-H program at NPS in order to decide what the focus of the 4-H program would be. Funding for the program was provided because of a proposal submitted by the NPS 4-H teacher coordinator and the Moshi District 4-H coordinator calling for training in sustainable and organic agriculture and animal husbandry methods in order to address the foci of their school's program. Although in the 4-H club there is a general emphasis on animal husbandry, agriculture, home economics, and forestry, the NPS school committee

collectively decided that the focus of the 4-H program at their school would be centered on agricultural and environmental sustainability and students would be taught organic farming methods in the 4-H club.

Another difference between the approach used by 4-H and Oikos was the way in which training was provided. Oikos trained teachers directly while in Nyota 4-H did not. Oikos heavily invested in school inputs and weeklong teacher training sessions in order to attempt to improve the quality of teaching and learning at FPS. 4-H, on the other hand, sought to do so through the provision of training to their 4-H district coordinator so that he could provide technical support to 4-H schools through follow-up visits.

In 1999, Moshi Ndogo District's first and only 4-H coordinator was hired. He told me that for the first five years 4-H provided him with a motorcycle and funding for gas so that he could visit schools. At that time, since he was responsible for supervising 54 schools in Moshi Ndogo District, one of which was NPS in Nyota village, he was expected to visit each of the schools consistently. During these initial years, he was able to make one follow-up visit per semester. Afterwards, he made his annual trip to the 4-H headquarters in Tanga Region where he reported on the results of all the projects undertaken as well as the profits made from each of his schools and districts.

Early in the program at NPS, the 4-H coordinator for Moshi Ndogo District organized trainings for NPS teachers and students on how to run their 4-H program. In order to better understand the nature of these trainings he had provided, I attended a three-day training he held in Maembe, Kilimanjaro in December 2011 for a new 4-H club that was starting up there. Although there was no funding for this training from the 4-H headquarters, support was provided by a Norwegian benefactor who supported 4-H

programs in Maembe. The training he gave focused on the democratic processes that students and their 4-H teacher coordinator were expected to use in their group meetings. This included showing the student chairperson how to open up meetings, facilitate group discussions and mediate group discussions about the desired objectives for their club. The students were also shown how to calculate the costs incurred and profits attained from their individual projects in their 4-H notebooks.

At the outset of the 4-H program at NPS in 2003, funding from 4-H was provided for staff from the Kenyan Institute of Organic Farming (KIOF) to work with teachers and community and student leaders in their community for an extended period of six months. Two teachers from KIOF came to work at NPS and, during this time, teachers from other nearby schools with 4-H programs traveled to NPS and stayed for training. Typically KIOF staff hosted demonstrations of organic farming methods and then teachers as well as community and student leaders applied these methods in their own plots at NPS. In short, when KIOF staff worked at NPS, the emphasis was on demonstration and then having the teachers carry out the skills taught to them, as conveyed by this statement from the NPS 4-H teacher coordinator, Daniel Nnkini:

Staff from KIOF came to NPS three times over the span of six months. These activities were sponsored by 4-H. During this time, seminars were held by KIOF that were given to about 50 people which included teacher and student representatives from schools around Moshi Ndogo District. A few KIOF personnel stayed to work with me two times for six weeks so as to demonstrate how to run animal husbandry and agriculture programs organically. They showed me what to do and then asked me to practice applying the skills independently.

The goal was for NPS to run these programs independently by being able to make a profit.

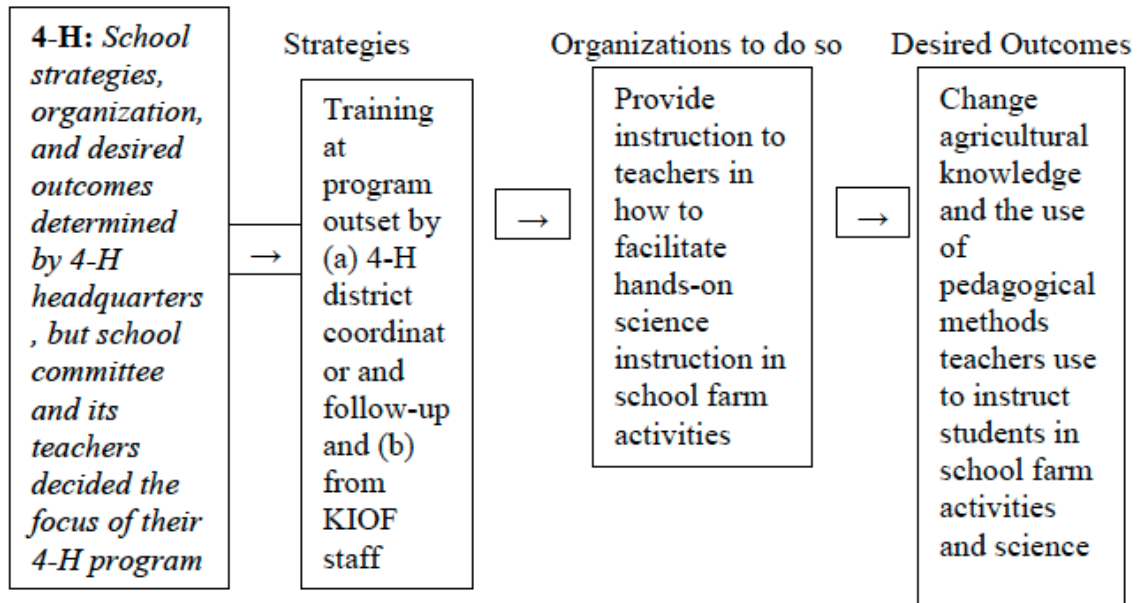
Although demonstration activities were a major emphasis in the KIOF training at the outset, aside from the independent agriculture and livestock activities 4-H club students worked in doing through their 4-H club notebooks, there were no follow-up procedures for ensuring that parents and students brought such methods home.

Explanation of Chain of Influence for NPS

This diagram shows the chain of influence used in the 4-H approach. A primary focus is to work with teachers to foster change in the instructional methods applied in science and school farm activities (see Figure 13). The diagram starts with the 4-H goal, which is to change teaching practice and student knowledge and attitudes. The chain shows the strategy of providing training at the outset and through follow-up activities, which are then connected to providing instruction to teachers about how to facilitate hands-on science instruction in school farm activities, with the desired outcome of changing teaching and the pedagogical methods teachers use to instruct students.

Figure 13. Chain of Influence for NPS

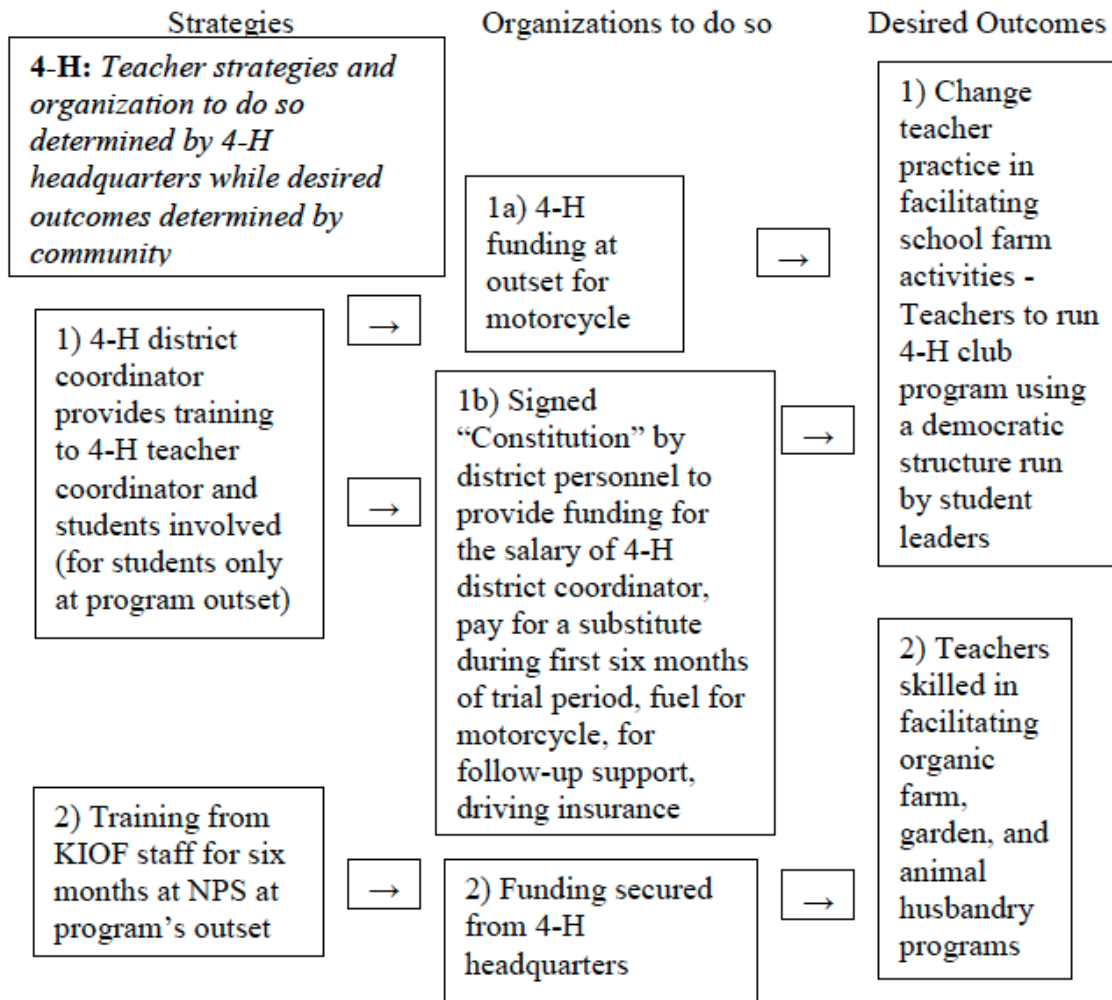
Goal: *Change agricultural knowledge and pedagogy in science used by teachers*



Explanation of chain of influence for NPS teachers. Similarly to the focus of Oikos at FPS, a major focus of the 4-H-supported program was the provision of training and technical support to teachers in facilitating effective school farm programs. Oikos endeavored to do this through the provision of intensive training sessions for teachers and follow-up support on site at the schools as needed (see Figure 14). In this diagram there are two chains based on who provides training to whom, one in which the provision of training to the 4-H teacher coordinator and students involved is assumed to result in the desired outcome of changing teacher practice in facilitating school farm activities using a democratic, student-led approach. The second chain is concerned with equipping teachers with skills in facilitating organic, farm, garden, and animal husbandry programs. In this chain the teachers are provided with training from KIOF staff at the program's outset.

Figure 14. Chain of Influence for Teachers in NPS Community

Goal: *Change teacher practice, knowledge, attitudes in facilitating school farm activity*



Explanation of 4-H project objectives for NPS teachers. In the initial years of the 4-H program at NPS, in addition to the 4-H headquarters providing funding to pay for a motorcycle and the running costs of the 4-H district coordinator making visits to 4-H schools in the Moshi Ndogo district,⁵⁵ funds were also allocated for the training of NPS teachers and parent and student leaders at their school, which was the main component of

⁵⁵ See "Comparison of 4-H project objectives for NPS to the Oikos objectives at FPS" above for further reference.

how the program intended to transfer knowledge to the community. Organic farming methods were taught extensively over a six-month span to teachers by staff from the Kenyan Institute of Organic Farming as noted by former NPS school chairperson, Otto Moshi:

[4-H] paid for weekend retreats for the students, sponsored student trips to the 4-H headquarters in Tanga, and provided training for several teachers at Nyota Primary School. The greatest contribution that 4-H had made to the school was to provide funding for [a particular staff member] from KIOF who stayed here for a month and provided seminars and demonstrations to teachers, parents, and students. This had a very positive effect on the school because teachers like [the female 4-H teacher coordinator at NPS] learned how to make and use organic pesticides and then taught these skills to the students.

But according to the 4-H coordinator for Moshi Ndogo District, in 2006 the structure for how 4-H programs were organized in Moshi Ndogo District was changed. It was decided by the 4-H headquarters in Tanga Province, Tanzania that all of the 4-H clubs in Moshi Ndogo District should be run independently without their support. Leaders from the 4-H headquarters met with lead district officers. These district leaders agreed to the constitution that was drafted and wrote their signatures. By signing the constitution, the Moshi Ndogo District officers agreed to provide funding for the following:

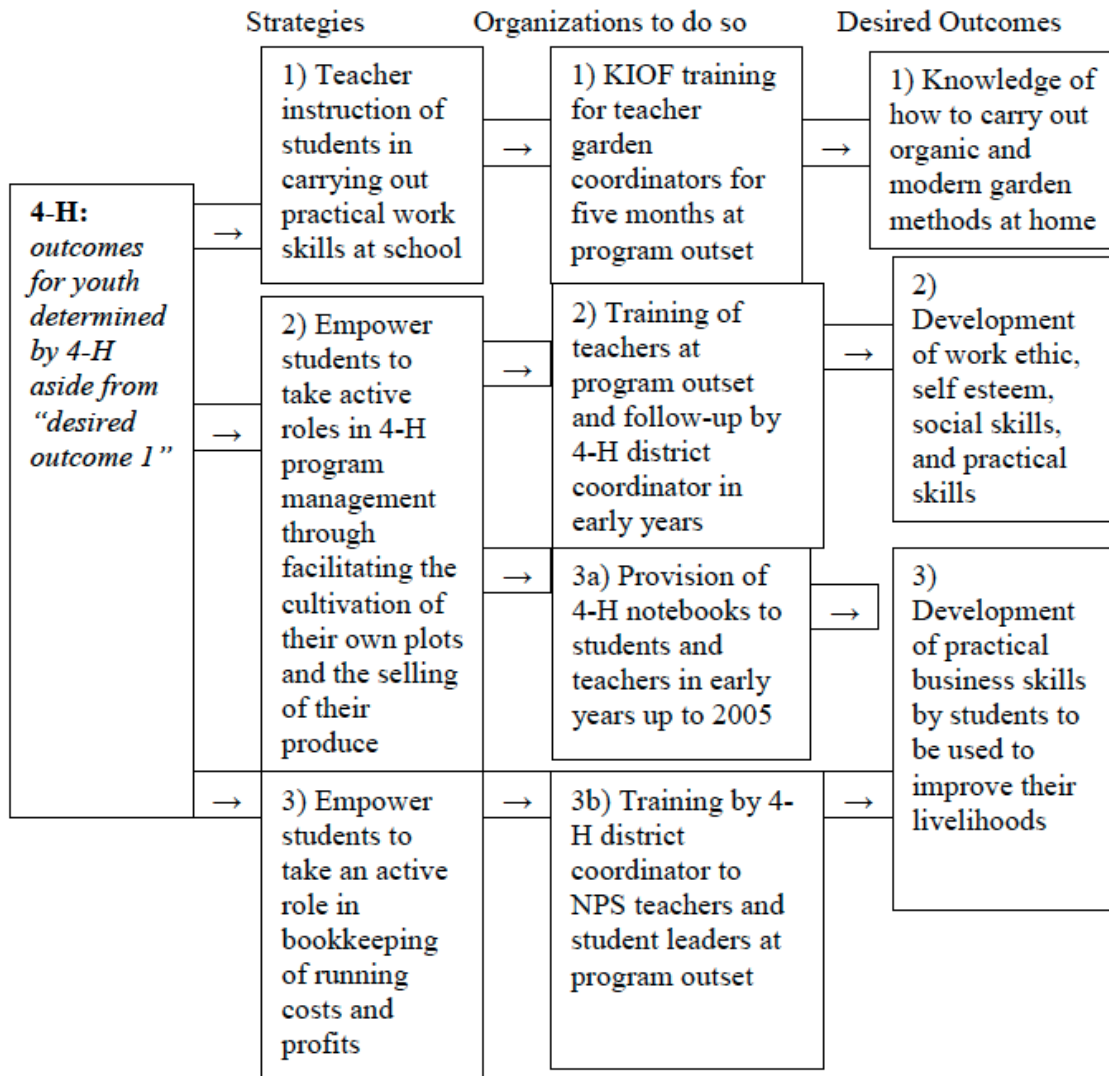
- gas in order for the 4-H coordinator to be able to visit all 4-H schools in Moshi Ndogo District,
- insurance for the motorcycles the 4-H coordinator drove, and
- training activities of 4-H teacher coordinators and student leaders held annually.

According to the 4-H coordinator for Moshi Ndogo District, certain rules were agreed upon for the hiring of 4-H coordinators for Moshi Ndogo District. That is, during their first 6 to 12 months, a newly hired 4-H teacher coordinator for Moshi Ndogo District would be permitted to teach only half time at the particular school where he or she taught and would be required to spend the rest of the time supervising 4-H programs at other schools. In order for them to be able to do so, the Moshi Ndogo District officers agreed that substitute teachers would be provided with district funding so as to fill in for the 4-H coordinator's teaching duties at their school. After this trial period, the district officer would choose whether they wished to recommend this 4-H coordinator to work in supervising 4-H programs full time.

Explanation of chain of influence for NPS students. The 4-H supported program at NPS sought to improve agricultural methods carried out in households through student participation in school cultivation programs (see Figure 15). In this diagram, there are three chains, one in which training of coordinators and teaching of students is assumed to result in the desired knowledge of how to do organic, modern farming. The second chain is concerned with the development of work ethic, self-esteem, and social skills as well as practical skills. In this chain, the teachers are trained with the intent to empower students through the work of cultivating their own plots and selling the produce. Finally, the third chain focuses on development of business skills by giving students an active role in bookkeeping, using notebooks provided by 4-H, and receiving training from the district coordinator. Unlike the Oikos intervention, this approach significantly challenges the main expectation discussed in chapter 5 that the main role of teachers is to prepare students to pass national exams through rote instruction.

Figure 15. Chain of Influence for Students in NPS Community

Goal: *Change student knowledge, attitudes, and practice in fostering development in practical life skills and socialization*



Explanation of 4-H project objectives for NPS students. It was decided by the NPS school committee and its teachers that they wanted to address environmental problems faced by their community that they were concerned with, such as soil erosion and depletion. A main goal of the village and teacher leaders in Nyota was for students to gain sustainable agricultural knowledge, particularly in organic farming methods, and to diffuse this information to their families (see Figure 15). This included teaching

students how to use natural fertilizers and pesticides in their school's cultivation plot and how to feed their school's farm animals (pigs, cows, goats, chickens) using plant fodder from the plant matter growing on their land. It was the view of the NPS school committee that having students carry out these activities would have a spillover effect because students would share this knowledge with their families and would also grow up to be citizens of their village that would apply these organic methods on their own land.

While the NPS school committee and teachers decided upon the focus of its 4-H club for students, additional objectives for students in the 4-H program were predetermined by the 4-H headquarters. These were for students to develop work ethic, self-esteem, social skills, and practical skills (Victorson, 2013). Work ethic is an important component of 4-H in terms of students actively participating in service through working and learning in partnership with adult facilitators. The ability of students to learn to work hard with effort was a major goal of 4-H that reinforced the expectation discussed in chapter 5 of students developing work ethic. These aims were to be accomplished through having the 4-H students take active roles in the management of their own garden space such as cultivating their own plots and selling their own produce.

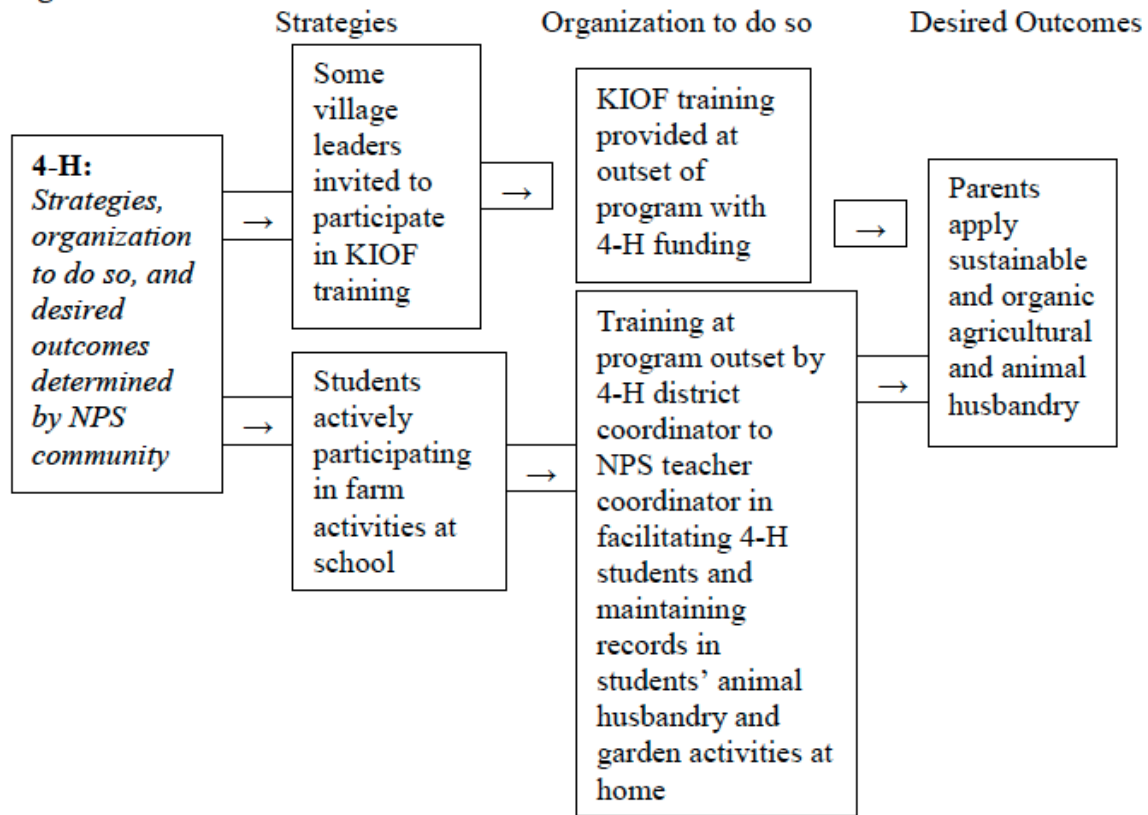
Another objective of the 4-H headquarters (but not the NPS community as was shown earlier in this chapter) was for students to develop practical business skills that could be used to improve their livelihoods now and in the future. This should have reinforced the expectation discussed in chapter 5 concerned with students being able to generate income. Efforts were made by 4-H headquarters for the NPS students to learn to do so by individually recording the running costs and profits of their business ventures in their 4-H notebooks.

The 4-H district coordinator provided training at the program outset to the 4-H teacher coordinator at NPS about how to have their students in the 4-H club maintain these records in their 4-H notebooks appropriately. During this training it was also explained to teachers how to facilitate activities where the NPS students work independently in small groups in farming their own cultivation plots. It was assumed by the 4-H instructors that the NPS teachers would continue to support their 4-H club students in carrying their duties out independently with follow-up support provided as needed by the 4-H coordinator for Moshi Ndogo District.

Explanation of chain of influence for NPS adult villagers. In Figure 16 , there are two chains; the goal of each is for parents to apply sustainable and organic agricultural and animal husbandry methods. The first chain seeks to do so through providing KIOF training to selected village leaders. In the second chain, 4-H club students participate in agricultural and animal husbandry activities at home and school, and, presumably, their families also learn to do so. Like the Oikos-supported program at FPS, the 4-H-supported program also had the main objective of influencing change among adult villagers through encouraging them to apply sustainable farming methods (see Figure 16). Training of teachers and adult villagers was the primary approach utilized through donor-support at each school.

Figure 16. Chain of Influence for Adult Villagers in NPS Community

Goal: *Change agricultural knowledge and practice of adult villagers in sustainable agriculture.*



Also, a main strategy utilized by both donors to encourage sustainable agriculture was through diffusion of information by students to their parents. Follow-up visits where technical support was provided as needed were organized in both communities.

However, a main difference between these programs was the nature of the initial training and follow-up support provided. While Oikos utilized its training centre for weeklong retreats, 4-H organized intensive training at NPS given by KIOF staff at the program outset and provided funding for follow-up visits made by Moshi Ndogo District's 4-H coordinator to the site.

4-H project objectives for adult villagers at NPS. Like the Oikos program at FPS, the main objective of the 4-H school garden program at NPS was for villagers to

learn to apply sustainable and organic methods back at home on their farms, but unlike FPS, the 4-H program extended education to include best practices for the raising of livestock (see Figure 16). While the Oikos program's provision of training was to FPS community and women's group leaders as well as its teachers at their training centre, 4-H only provided training to community leaders and teachers at the outset, when the program was established. The 4-H training objective, changing prevailing practices and expectations, presented more of a challenge than the similar Oikos objective because it incorporated more stakeholders. In contrast to the Oikos week-long training retreats held at their training centre, 4-H endeavored to educate stakeholders through the funding of KIOF staff to facilitate farm and livestock projects at NPS for five months. Community leaders in the NPS community and other nearby villages were invited to attend workshops held by KIOF staff at NPS during this time.

The second chain of Figure 16 illustrates how, when KIOF training was completed, NPS teacher participants were expected to facilitate their school's 4-H garden program effectively. The 4-H student participants at NPS were expected to apply sustainable and organic methods to their farms and livestock back at home through the support of the 4-H teacher coordinator at NPS. This was because at the program's outset the 4-H district coordinator trained the NPS teacher coordinator in how to facilitate a program where 4-H students maintained records of their animal husbandry and garden activities at school as well as independently at home. When this training was completed, follow-up support to the 4-H teacher coordinator at NPS was presumed to be provided by the 4-H Moshi Ndogo District coordinator as needed. Again we see the intended strategy

for transferring knowledge to NPS parents was through diffusion of the information from their children, who were 4-H club participants at NPS.

Constraining Factors of Projects

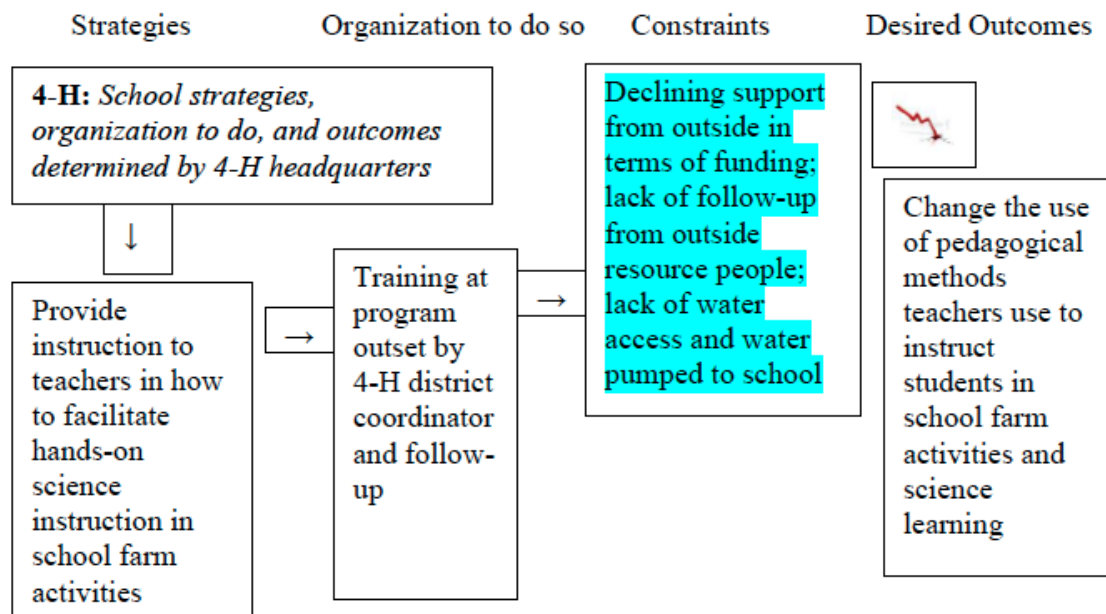
The constraints detailed below (in Figures 20, 22, 25, and 26) presented major challenges to the achievement of the 4-H objectives centered on the improvement of instructional quality at NPS. Like Oikos at FPS, it was also the objective of the 4-H programs for students and their families to apply sustainable agricultural methods in the long-term. However, during the research I conducted in the NPS community, I observed that the projects had made only scant progress in attaining either of these goals.

Constraining Factors in Chain of Influence at NPS

A major objective of the 4-H program at NPS for schooling was to influence the type of pedagogical methods used by NPS teachers in school farm activities and science learning (see Figure 17, which is Figure 13 plus constraints). However, as in my research on the Oikos intervention in FPS, I found little evidence that instructional practices had been strengthened though 4-H involvement at FPS. Four reasons I found for this failure were primarily structural constraints: funding for the 4-H program at NPS ended, there was a lack of technical support provided during follow-up visits, and there has been a lack of access to water in recent years, which reduced the availability of farm-based instruction because they could not teach farming since plants dried up (refers to the section of Figure 17 shaded with the color blue under “constraints”). A non-structural constraint was that the production-based activities stood in the way of improved pedagogical instruction since teachers focused on giving students orders to do labor activities in order to generate more revenue.

Figure 17. Constraints in Chain of Influence for School in NPS Community

Goal: *Change the practice and knowledge of teachers*



The first constraint was the lack of 4-H funding. After 2006 the 4-H headquarters in Tanga Province, Tanzania ended funding for the 4-H program at NPS. As per the signed agreement, Moshi Ndogo District officers had agreed to run the 4-H programs independently without further financial support from the 4-H headquarters. But, according to the 4-H coordinator for Moshi Ndogo District, after 2006, aside from the provision of the salary for the 4-H district coordinator, the Moshi Ndogo District officers did not follow up as promised. Funding was not provided for the costs of annual 4-H teacher and club leader training nor to pay for fuel costs for the 4-H district coordinator for Moshi Ndogo District to use a motorcycle to visit 4-H schools, as reported by the 4-H coordinator for the Moshi Ndogo District, Daniel Nnkini:

The constitution was signed by the district officer, but when a different officer replaced him, the new officer did not want to follow these rules of funding.

Technically this was against the rules of governance in Tanzania, but he did it anyway. ... I did not get fuel; I could not afford the running costs myself. I needed to visit five schools a day. But I did not have funding for fuel and needed to use money from my own salary to visit the 4-H schools. I could not do my job. Teacher coordinators from the sites where I worked called me to ask for my help, but I had no money to visit them.

Although the salary of the 4-H teacher coordinator was paid by Moshi Ndogo District in the initial years after 2006, he stated that when he retired in 2010 there was no one hired by the district to replace him. The reason he gave for a 4-H teacher coordinator not being hired to replace him was because of the lack of incentives offered for his position. Thus, he was unable to provide support to visit the 4-H school sites on a regular basis as Nnkini explained:

Currently there are 110 4-H teacher coordinators who volunteer in Moshi primary and secondary schools. There are many teachers who are interested in my position, but when they learn that there is no funding provided for the running costs of school visitation, they decide that keeping their teaching position is preferable. The only reason I still do the 4-H club is because there is [an expatriate] woman who works in Maembe, Kilimanjaro and she uses funding from Norway in order to operate 4-H programs. She provides funding for my transport costs. If it was not for her I would have closed my office [in Himo village, Kilimanjaro Province], which was provided by Moshi Ndogo District.”

Aside from the 4-H clubs supported with Norwegian funding in Maembe village, Kilimanjaro Province, there was no longer any funding being provided by the 4-H

headquarters for their programs in Moshi Ndogo District's 54 primary and secondary schools (again, refer to the section of Figure 17 with the color blue under "constraints"). The 4-H coordinator for Moshi Ndogo District opted to continue to volunteer as the 4-H coordinator in a limited capacity because he was interested in working with Kilimanjaro communities in improving the environment.

Despite 4-H funding for the school garden program at NPS being discontinued in 2006, during my research conducted from January to March 2012 in Nyota village, I found that student involvement in 4-H garden activities was still being carried out in a limited way on the ¼ acre garden plot at NPS. However, I observed that the nature of what was called "4-H work" at NPS involved a task of chores that year VII boy students at the school mainly were required to follow. Aside from the year VII girls bringing over bags of manure from the hole behind the school when the year VII boys planted the garden, I did not observe any work being conducted in the garden by the three 4-H girl students in year VII at NPS. The year VII boy students at NPS worked in the school garden occasionally after they planted when given work orders by the NPS teacher agriculture coordinator. Other than the infrequent garden work conducted by 4-H male club students in year VII at NPS, I did not observe any additional 4-H activities being conducted at NPS; students were not carrying out their own farm projects independently, student governance was not established to facilitate 4-H meetings, and records were not kept of the profits and costs incurred in their 4-H notebooks.

Lack of access to water. The lack of access to water in recent years was another constraint hampering the effectiveness of the 4-H garden program at NPS (see Figure 17 in shaded blue box under "constraints"). As I learned from the NPS head teacher,

Valerian Mbise, NPS was unable to pay its water bill in recent years. Despite NPS being located in one of the northern Tanzania provinces with more rainfall (United States Department of Agriculture, 2003), the school was required to pay for access to water:

A meter has been installed. If we pay the water bill, it is 10,000 shillings per month... We cannot afford to pay 10,000 shillings each month. The program cannot be run like before. Before the 4-H teacher coordinator [at NPS] provided training to parents and community members every Wednesday. She taught them by having them do activities and running demonstrations. Now we stopped this because we do not have water. We cannot show community members how to use organic pesticides because there is not enough water.

The water shortage NPS faced was similar in nature to the obstacles encountered at FPS, when the 2012 rainy season drought hampered the running of their garden program. As at FPS, staff at NPS did not attempt to address these water constraints through experimentation with growing drought-resistant plants. Instead, they opted to continue to farm using traditional crop varieties used by *WaChagga* (people of the Chagga ethnic group) in Kilimanjaro.

Time-based constraints to pedagogical improvement. I observed that student farm activities accounted for a great deal of time in the daily schedule of all NPS students. The timetable below illustrates that approximately 3 hours and 15 minutes were devoted each day to outside work activities for all NPS students (see Figure 18). During my six weeks of time spent at NPS, I observed that during some weeks teachers suspended classroom activities so that students devoted more of their time to outside work activities. For example, during the “corn harvest” week of 20-24 February 2012,

NPS students generally worked for the entire day after the morning break, performing tasks including shucking ears from stalks, picking out kernels, cleaning debris from kernels, and loading up stalks to be hauled to a neighboring farm.

During that week, while students still attended class during the morning block from 8:00 a.m. to 10:00 a.m., they were then sent out to haul manure from a local farm ten minutes away. By the end of the morning, NPS students were required to haul five loads of manure back to school. The students brought buckets and burlap bags from

Figure 18. Timetable for student farm work at NPS

- *7:15-8:00 a.m.* - **Cleaning their plot of the school grounds:** Student groups had a section of the school grounds that they were responsible for cleaning for the entire year. Any late students were reported by their year VI student leaders and later received corporal punishment or were required to bring extra manure or firewood to school.
- *10:00-10:30 a.m.* - **Work around the school as the teachers see fit:** This included picking spinach in the school's cornfields (girls only), watering the garden (boys), clipping hedges (girls), sweeping the school grounds (all students), cutting bananas or vegetables for the teachers' lunch (girls), or going to the market to buy vegetables on Tuesdays or Fridays (generally only girl student leaders).
- *12:30-1:30 p.m.* - **Farm work:** The NPS students were assigned particular jobs that they had experience doing, such as cutting grass for cows (the majority of students were sent out to do this daily), using machetes to cut up banana trees with machetes for cows to eat (boys), cutting up bushes and banana tree leaves for goats and cleaning out their pens (boys), removing manure from the cattle pen in the barn and putting it at base of banana trees (girls), and picking plants for the teachers' chickens (all students). All of these tasks were overseen by year VI student leaders; students were written up and later punished if they did not perform their job adequately.
- *3:30-4:30 p.m.* - **Students continue learning in class or working outside depending on what teachers decide:** Outside work during this time included cleaning the school grounds, mopping latrine (girls), or doing garden activities as needed.

home and marched back and forth from school carrying this on their heads or shoulder. In the afternoon after lunch, they were again required to make more trips, but this time they needed to do so ten times each. A few hours later, when they had ten tick marks next to their name, they were allowed to play in the field or go home.

Students also continued to do other farm work daily at NPS (see Figure 18). This included feeding their livestock (pigs, goats, chickens, pigs), cleaning barn areas, picking grass for cattle feed, chopping up banana trees for cattle and goat feed, and transporting manure to provide fertilizer to banana trees. Girls at NPS (but not boys) also had to clear the cow manure from the barns.

One morning during the break, I decided to join in the untouchable work ordinarily reserved for girls: manure removal in the barn. Riziki Godwin from year V taught me how to grab the wet scraps of bananas, corn, and feces coated with urine and place them in piles. She then showed me how to haul the manure outside and throw it in a pile where it would later be placed around the banana trees. Little by little we were able to remove most of the wet material from the floor of the barn. When we were finished we went to the water faucets and washed our hands. We did so without soap. When I observed that Riziki drank water from the faucet out of her hand, I wondered how she would avoid becoming sick. I was able to go to the teachers' bucket to clean up again using soap, but Riziki did not have this option until I secretly shared the soap with her.

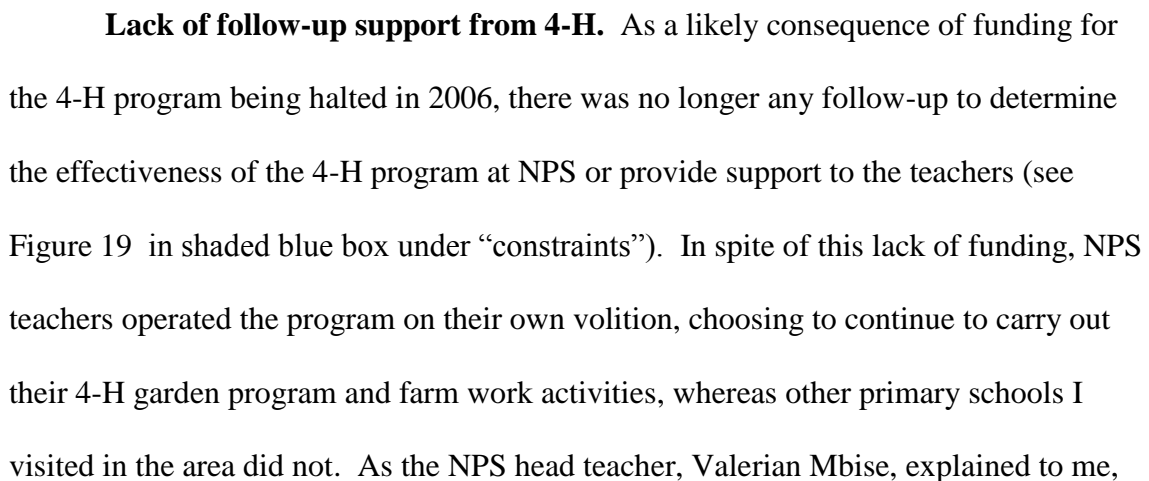
Knowledge-based constraints to pedagogical improvement. Students were required to comply with their farm work duties at NPS order to produce crops and

livestock that would be sold to raise revenue for NPS. However, as will be discussed in the sections below, I observed that the pedagogical methods teachers used to instruct students were not influenced by the tenets of the 4-H club, which called students to participate actively in science learning.

Constraints in Chain of Influence for NPS Teachers

Figure 19, is the same as Figure 14, “Chain of influence for NPS teachers,” but with the constraints for the project included here. The desired outcome of changing teacher practice in facilitating school farm activities did not progress as intended for two reasons: (a) there was a lack of follow-up support from 4-H and (b) there was prevalent teacher absenteeism.

Goal: *Change teacher practice, knowledge, attitudes in facilitating school farm activity*



the NPS' 4-H program was still being run because teachers still recognized the importance of teaching organic methods to their students:

We continue the 4-H program here because the students learn how to use organic pesticides and manure. This is a benefit to 4-H students and their families because it can reduce the high costs they must pay for store-bought poison. At home, NPS students do not get an education like this.

During my interview with the 4-H teacher coordinator at NPS, Aneti Elisa, she expressed the desire for continued training in the application of organic agricultural methods.

However, there was no longer funding available from the 4-H headquarters in Tanga Province. She explained that the Moshi Ndogo District 4-H coordinator helped NPS teachers to draft a proposal for funding from the 4-H headquarters and their support network in Scandinavia in order to have staff from the KIOF again come to provide training. They did not receive the requested funding. In addition to these training limitations due to lack of funding, I also observed that the teaching practices at NPS acted in opposition to the program goals for teachers of changing teacher practice in facilitating school farm activities (again see Figure 19 under constraints).

Teacher absenteeism from teaching duties at NPS. Similarly to FPS, I found that a major barrier to the 4-H goal for teachers of active instruction in the sciences was chronic teacher absenteeism in the classroom and in farm activities at NPS (refer to Figure 19 in shaded blue box under “constraints”). Figure 20 provides data on teacher presence and engagement during two typical days. At NPS I collected data when the head teacher was present at NPS. Data from both days shows that, even when the NPS teachers were in the classrooms, teachers often had students copy notes from the board

while sitting quietly at their desks. Furthermore, on these days when the head teacher was present, I observed that teachers more diligently adhered to their schedules, especially in the morning. For example, data from “Day One” shows that the teachers adhere more to their schedules at the start of the day, but in the afternoon several teachers left their classrooms of students alone to do work independently. Data from Day Two shows that teachers did not enter classrooms for the two hours when the teachers had a teachers’ meeting.

Figure 20. How Often Were Teachers at NPS in Their Classrooms?

23 January 2012: Day One

- **8:15 a.m.:** 7/7 classrooms have teachers in them, in 2 of these classrooms, students are copying notes from the board
- **8:45 a.m.:** 6/7 classrooms have teachers in them, in 2 of these classrooms, students are shouting out responses in unison
- **9:15 a.m.:** 7/7 classrooms have teachers in them, 2 of these are copying notes and one other with students up in a group at the front
- **9:45 a.m.:** 6/7—Teacher “L” left classroom I was in and indirectly handed over the responsibility to teach the class to me without asking me
- **10:15 a.m.:** On break
- **10:45 a.m.:** 6/7—Teacher “L” not in year VII class (Note: one of the teachers is on maternity leave at the school, and I learned today that Teacher “L” often must teach two different classes. He achieved this by having student leaders in the year III classroom write notes from his textbook on the board and the other students copied this in their notebooks.)
- **11:15 a.m.:** 5/6—In 3 of these classrooms students are copying notes from the board
- **11:45 a.m.:** 5/6—Same
- **12:15 p.m.:** 4/6—2 with no teacher, and 2 with teacher copying notes from the board
- **12:45–1:45 p.m.:** Lunch break
- **2:15 p.m.:** 3/5—In 2 classes with no teacher, students are working in notebooks at desks
- **2:45 p.m.:** 4/6—In 1 out of the 2 unattended classrooms, students are copying notes at their desks
- **3:15 p.m.:** 4/6—Same.

Figure 20 (cont'd)

24 January 2012: Day Two

- **8:15 a.m.:** 6/7 teachers in classes, one still in office preparing notes
- **8:45 a.m.:** 4/7—Of the three that were not: 2 had teachers standing outside them talking and, in the other room, students were left alone to write in their books
- **9:15 a.m.:** 5/7—Of the two that were not: 1 in bathroom, 1 with students doing work at desks
- **9:45 a.m.:** 7/7—One copying notes off the board
- **10:15 a.m.:** On break
- **10:45 a.m.:** 0/6—Teacher meeting
- **11:15 a.m.:** 0/6—Teacher meeting
- **11:45 a.m.:** 0/6—Teacher meeting
- **12:15 p.m.:** 2/6—In other 4, students independently writing notes from the board while student leaders are monitoring behavior
- **12:45-1:45 p.m.:** Lunch
- **2:15 p.m.:** 2/5—Of three that are not, all copy notes of the board; in 1 of the 2 classes with teachers in them, the teacher is sitting quietly in the back and students are copying notes from the board
- **2:45 p.m.:** 5/6—1 of these copying notes from the board, and in the one without a teacher, students are also copying notes from the board
- **3:15 p.m.:** 6/6—2 copying notes from the board

Further data was collected about the work activities of two teachers at NPS on the day (February 24, 2012) when the NPS head teacher was not present. I selected teacher Aneti Elisa because I had observed her to be one of the more actively-involved teachers at NPS, and she was also the 4-H school garden coordinator. I selected teacher John Urio because I observed him to be one of the less-actively involved teachers at NPS, and I often was unsure of his whereabouts during a given school day. The data show that the two teachers who were selected frequently failed to adhere to their classroom schedules. Aside from following her morning schedule for the three subjects before the tea break at 10:00 a.m., Teacher Aneti Elisa was the only one engaged in teaching her classroom of students when I stopped in again at 12:30 p.m. For teacher John Urio the data shows that

he was only engaged in teaching his students once during a civics lesson at 11:00 a.m.

The rest of the time he was grading student work in the teachers' office, writing notes on the board, or watching over students to make sure that they were quiet in the hallways and in the classroom.

Figure 21. February 24, 2012: What Were Two NPS Teachers Doing?

4-H teacher coordinator, teacher Aneti Elisa

08:00 a.m.: In teachers' office chatting with other teachers at her desk

08:30 a.m.: Writing notes on board in year III classroom

09:00 a.m.: Standing outside year III classroom, students in class have been given monthly test in math

09:30 a.m.: Giving lecture to year V class in science

10:00 a.m.: Students copy notes at board

10:30 a.m.: Away from school, picking up an item from her house

11:00 a.m.: Same

11:30 a.m.: In teachers' office, reading letter from the Tanzanian Ministry of Education & Vocational Training to other teachers

12:00 p.m.: Studying geography textbook in teachers' office

12:30 p.m.: Teaching geography to year V. She is writing notes on the board about the human population in Africa

01:00 p.m.: In teachers' office chatting with retired NPS teacher who came to visit

01:30 p.m.: Chatting to other teachers while writing her required lesson plans

02:00 p.m.: Eating lunch

02:30 p.m.: In teachers' office playing with cell phone while students remove corn

03:00 p.m.: In teachers' office talking with other female teachers

03:30 p.m.: In teachers' office writing lesson plans

04:00 p.m.: In teachers' office grading student notebooks

Figure 21 (cont'd)

Teacher John Urio

08:00 a.m.: Watching students march to class after singing Tanzania national anthem
08:30 a.m.: Year III math class, students copying notes he has written at the board while he sits quietly at a desk
09:00 a.m.: In teachers' office, correcting student work in notebooks
09:30 a.m.: Same
10:00 a.m.: Same
10:30 a.m.: In teachers' office, writing his lesson plan for studies of work year VI
11:00 a.m.: Entering year V class to teach Civics
11:30 a.m.: In year V class, sitting in a desk while students copy his notes written on the board and fill in the blanks while quietly correcting student work
12:00 p.m.: Same
12:30 p.m.: In line walking with year I and II students. Dismisses year I and II students to go and plan in back field
01:00 p.m.: Standing watch in front of teachers' office while students do midday chores
01:30 p.m.: Standing watch in "dining hall" with stern look on his face. He tells me that "no students are permitted to talk when eating lunch. If they do they will receive a punishment."
02:00 p.m.: In teachers' office, sitting in front of radio and beginning his lunch
02:30 p.m.: Grading notebooks of students in office
03:00 p.m.: Same
03:30 p.m.: Same
04:00 p.m.: Same
04:30 p.m.: Students are dismissed

Classroom instruction and school farm activities commonly turned over to students at NPS. Another barrier to the 4-H goal of teachers facilitating hands-on learning activities at NPS (especially in the sciences) was that NPS teachers commonly put students in charge of monitoring farm activities and supervising classrooms. In school farm activities, year VI student-leaders were selected to oversee the work of the

students in their given group. Each group was generally comprised of 10 to 15 younger students and was changed by teachers every day. The student leaders were from year VI and were selected at the beginning of the year. Each day, on sheets of paper, which they later handed into their instructor, they checked off if a particular student in their group fulfilled her/his work responsibility. This included collecting two armfuls of grass to be fed to the cows (girls and boys), cutting up banana trees to be fed to the cows and goats (boys), or cleaning out the manure from the cow shed (only girls).

Even within the classroom, NPS teachers commonly turned over instruction to their students. I observed one student who stood watch over the classroom and took the names of any students who spoke. Later, during my interviews with students who I believed to be credible because they were leaders at the school, they reported that these students were later caned by their teacher. Thus, when left alone by teachers in their classroom, NPS students typically remained quiet and carried out doing work independently on their own. When they were finished, they sat quietly at their desk or found quiet work to do such as studying their notebooks.

On days when the head teacher was not present—this was often the case—I would observe that teachers were even less likely to adhere to their assigned teaching schedules. But even on days when the head teacher was present, teachers often left student-leaders responsible for teaching their classrooms. This example from my field notes illustrates the issue:

The year VI class was supposed to be taught studies of work during the two periods at the end of the day by Teacher Mary Jesta Urasa. I was there for the entire time, and observed that Teacher Urasa never entered the classroom.

Instead, a boy student leader, named Hoprey Lenadi Ngomud who was the *kaka mkuu* (big brother student leader) was standing on top of a desk in front of the classroom with chalk in his hand, and he was copying out of the teacher's manual notes about the history of Tanzania. The students in the classroom were remarkably quiet and merely copied what was written. While Hoprey wrote at the board, another student leader, the *dada mkuu* (big sister student leader), Irene Pendaely, was writing names down of *wasumbufu* (interrupting students). Later, Irene would give this sheet of paper to the teacher in charge, teacher Urasa, and these students would receive an *adhabu* (punishment). I noticed that, on the sheet of paper Irene was drafting, there were already fifteen names written down. Half of the names had a star written to the right of their name. This meant that they were interrupting excessively. They would be dealt with in kind by teacher Urasa later.

This system of turning instruction over to students was justified as legitimate by the NPS head teacher as well as by community leaders in Nyota village that I later interviewed. The culture of absenteeism at NPS thus created a constraint that directly interfered with the 4-H objective of active instruction, as it is difficult to provide any instruction at all when a teacher is not in the classroom.

Lack of training at outset for NPS teachers in using hands-on instruction in farm activities and science learning. In my attendance at the week-long training led by the 4-H district coordinator for Moshi Ndogo District for students in Maembe, Kilimanjaro, I found that there was a lack of focus on improving instructional methods that would be used by the 4-H teacher coordinator for this club at NPS (see again Figure

19 in shaded blue box under “constraints”). Instead, the nature of the training provided in the 4-H seminar I attended was focused on how to prepare students for running 4-H meetings independently; the 4-H teacher coordinator from Maembe Secondary School did not play a major role in facilitating the 4-H mock meeting and instead sat in a desk on the side of the classroom. This was because the major focus was on developing democratic self-management of the meetings by the club students. The teacher was not involved in the training because it was just for students.

On day one of the instruction at the three-day 4-H training hosted in Maembe, Kilimanjaro, the 4-H coordinator for Moshi Ndogo District, Daniel Nnkini, opened the seminar. He explained that the goal of the 4-H club workshop was to train the students so that they would be prepared to start their own club. He first introduced himself as having 28 years of experience with 4-H. He asked the students the question, “Why did you come here and what are you searching for?” He then asked us each to introduce ourselves—the last opportunity he gave students to talk for the rest of the morning. He gave each student a piece of paper to write notes and began to lecture about the history of the 4-H club internationally, its short history in Africa, how each club is organized, and the responsibilities of the club leaders such as the chairperson, vice chairperson, accountant, accountant assistant, and secretary.

Not including the 4-H teacher coordinator as a facilitator in the mock 4-H club meetings or focusing on the instructional methods to be used by the teacher in 4-H club activities strongly suggested that teachers would not apply hands-on instructional methods in club activities. Instead, teachers would be likely to rely on rote instructional teaching methods typically adhered to by teachers in Tanzania secondary schools in

Kilimanjaro as reported in Stambach (2000). This outcome was verified by my observations; during 4-H time, I did not witness the teacher coordinator utilizing these methods with the students.

The nature of KIOF training at NPS. Five months of intensive training were also provided at NPS by KIOF staff. Since KIOF is an agricultural institute, its staff focused their training at NPS on the provision of innovative organic agricultural methods. As a likely consequence of KIOF staff not being skilled in providing teachers with training in effective pedagogical methods to be utilized in farm activities, pedagogy was not a focus of this training. NPS teachers were not shown how to use and apply active learning methods. Instead KIOF demonstrated to teachers how to do certain tasks and then gave teachers orders for the work that they needed to carry out. Despite the democratic process being an international goal of 4-H for all 4-H club meetings, this objective was not emphasized during the KIOF training by the 4-H representatives nor was it practiced; instead there was a focus only on learning and applying organic agricultural methods. This showed that the representatives of 4-H working in the field were not trained in or able to demonstrate compliance with 4-H objectives. This suggests a more systemic problem of inadequately preparing district coordinators for their jobs of working with teachers in 4-H schools.

Although at NPS teachers chose to continue to carry out their 4-H program even after 4-H funding and training support was withdrawn from their school and others in Kilimanjaro Region in 2006, motivation to carry out 4-H club activities was reported to weaken over time. During my research conducted at NPS in 2012, I observed that students seldom met in 4-H club meetings, were no longer permitted to cultivate and sell

products from their own garden spaces as they did in previous years, and were infrequently taught how to apply organic farming methods at their schools such as how to make their own organic pesticides.

However, in addition to her regular teaching responsibilities, teacher Aneti Elisa, the 4-H teacher coordinator at NPS, did continue to teach NPS students organic methods for farming, such as the use of manure and ash in planting garden vegetables and how to collect particular plants grown organically on their three acres of school land and used in the school lunch or fed to the school's goats, chickens, and cattle. Both her work in 4-H and the farm activities carried out by teacher Fuatael Mlay were supported by the head teacher, who allocated a large portion of the school day for farm work activities by NPS students (refer to "Figure 18: Timetable for Student Farm Work at NPS" under "Constraining Factors in Chain of Influence at NPS" section above).

Although internationally the 4-H program involves students voluntarily deciding to join and become members, this was no longer the case at NPS. Students were selected by teachers who were actively involved in raising livestock or farming back at home. Since I observed that 4-H activities at NPS were given only limited attention by NPS teachers, it was possible that the 4-H club students did not learn anything new about livestock raising.

One of the main objectives of 4-H is to change teacher practice by building teacher capacity to act as facilitators where students are actively engaged in managing their own work. It is also a 4-H goal for teachers to allow students to engage in their club's governance where a democratic structure is adhered to at all 4-H meetings that are run by elected student leaders. However, at NPS, the method of instruction used by

teachers in farm activities was not in accordance with the hands-on methods promoted by 4-H internationally, where students are empowered to be participants in their own learning. The 4-H teacher coordinator at NPS was no longer acting as a facilitator who encouraged groups of students to manage and farm their own plots independently, sell their own produce, and keep records of their own expenses and profits.

A likely consequence for why such methods were no longer being encouraged was because they challenged the prevailing practices and expectations in the community for teachers to use rote instruction to prepare students for passing national exams. The former NPS chairperson, Otto Moshi, explained that the failure of NPS teachers to apply hands-on learning activities and cooperative group learning was because there were no longer any more incentives for NPS teachers to do so:

To a Tanzanian an NGO means *pesa* (money). NGO? Money. NGO? Money.

When the teachers at NPS learned that 4-H only provided funding for education such as training to teachers in seminars, conferences, and workshops, they lost interest. When the funding for the program stopped, the teachers did not continue the program because they did not see how the program could benefit themselves.

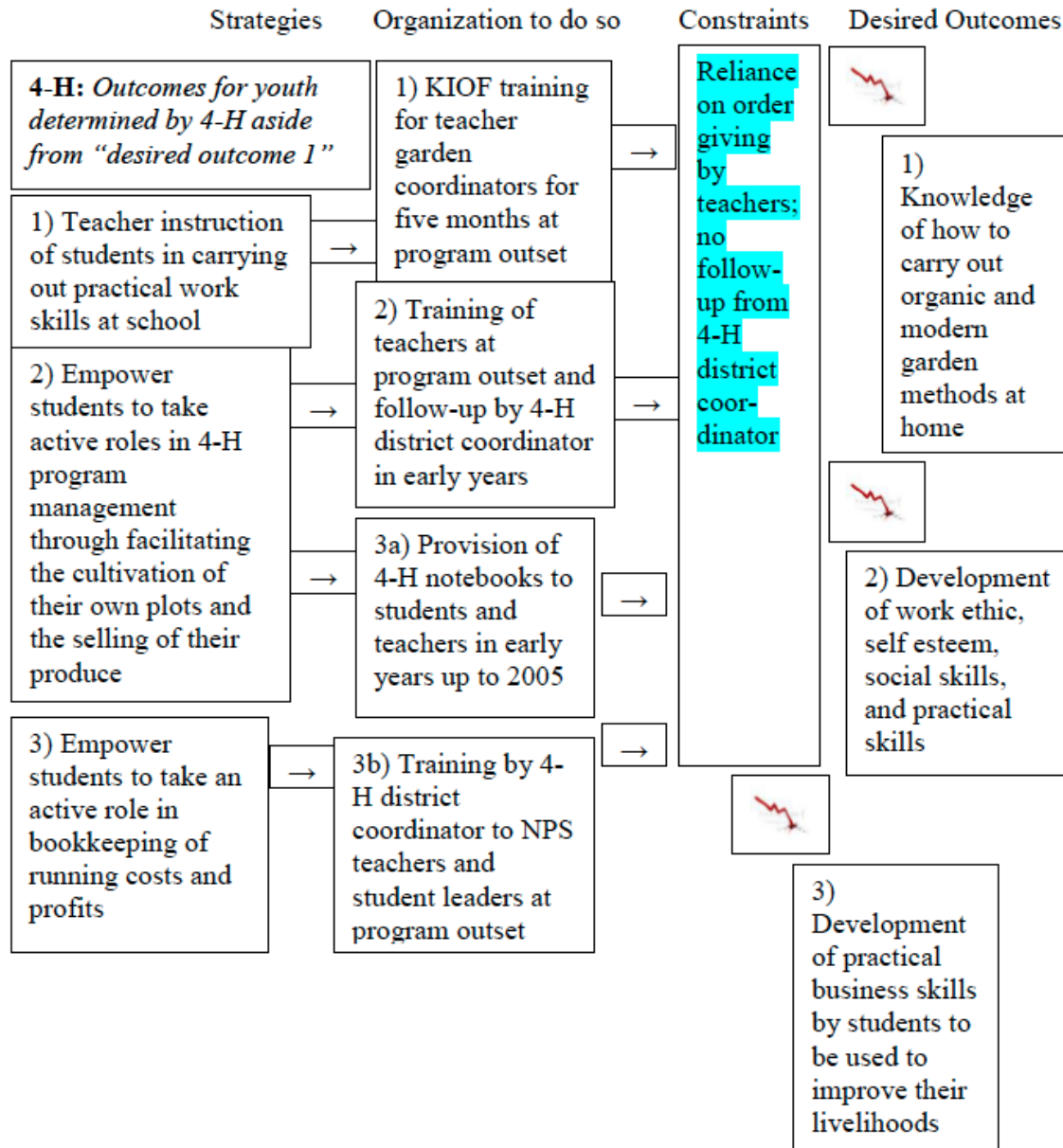
This quote illustrates that the lack of personal financial benefit caused teachers to be unmotivated to work in fulfilling 4-H club objectives. As will be discussed in the following section below, the lack of technical support for NPS teachers also led them to fall back on traditional methods of instruction in school farm activities and classroom learning at NPS.

Explanation of Constraints in Chain of Influence for NPS students

Figure 22, is the same as Figure 15 “Chain of influence for NPS students,” but the constraints for the project are included here. In the first, second, and third chains, the objectives of students carrying out organic and modern garden methods at home and developing practical life skills, socialization, and business skills did not go as intended due to reliance on order giving by teachers and the lack of follow-up from the 4-H district coordinator.

Figure 22. Constraints on Chain of Influence for NPS Students

Goals: *Change student knowledge, attitudes, and practice in fostering development in practical life skills and socialization*



A comparison of student constraints confronting Oikos at FPS and 4-H at NPS.

Reliance on order giving in school garden activities. While there were many constraints facing the students achievement of stated goals for both 4-H and Oikos, one of the most ubiquitous challenges was the teachers' preference for order giving. This

following excerpt from my field notes demonstrates a typical occurrence in the classrooms I observed:

At the start of the day [at FPS] none of the teachers were in their classrooms. I went into the year six classroom and, as usual, the students looked up at me in earnest hoping that they would be taught. A year VI boy eyed me and said, “Please, teach me.” Later, after twenty minutes, the teacher entered the classroom. He began teaching them conversions of millimeters to kilometers... When he finished teaching the lesson after ten minutes he assigned the students work and then left the classroom. The students were left alone once again. As I walked around the classroom I noticed that one of the girls was reading a comic book in Swahili quietly and tried to hide it while I walked by.

As we have seen, the emphasis of both donor-supported farming/garden programs was on equipping students with agricultural knowledge that would help to improve livelihoods of themselves as well as their family and community. Ideally, this knowledge would be transferred from students to their family members. However, aside from the classrooms of a few more motivated teachers at each school, I observed that there was not an emphasis on student learning during farm activities at school or an emphasis on classroom learning about science and agriculture. Rather, the basis of instruction at NPS was underscored by the simple accomplishment of procedural work orders (see Figure 22 above and Figure 11: Constraints in Chain of Influence for FPS Students in shaded blue box under “constraints” in chapter 6).

At both schools I observed that the primary nature of student activity in the classroom was copying notes from the chalkboard and having students do assigned

bookwork. In farm activities, students at both schools typically carried out orders given by teachers in the form of labor. Student farm work was used primarily as a means to generate income for their school at NPS; the corn and garden crops harvested at NPS were sold in order to make a profit. At FPS, the harvested crops supplemented the school lunch; the garden greens were cooked and were served to teachers and, to less of an extent, to students.

As the excerpt above illustrates, teacher presence and engagement in the classrooms during their assigned teaching times was often found to be intermittent at both schools. I also found that teachers at both schools interacted with their students only when their teaching duties were enforced. When teachers did engage with students, I observed that, in lieu of following the main objective of 4-H internationally, which is to facilitate hands-on science learning for students, the teachers resorted to the traditional method of giving students orders to carry out in silence for both 4-H and non-4-H farm activities at NPS. Teachers or student monitors then authoritatively supervised the students by watching over them but without engaging actively with students (as in walking around to oversee their work or providing feedback). For example, an excerpt from my field notes:

One morning after break time when the teachers sent the students out to remove the ears from all the stalks, the teachers stood at one edge of the corn field and Teacher Aneti Elisa shouted, “Run and begin work! Go to the fields and start bringing the corn to the classroom.” The students dutifully set out with sacks and buckets that they had brought from home and gathered in sections of the corn row, jamming its intersections like a clogged artery.

Not only were students required to follow direct orders on the school's farm plots, they were also prevented from working on independent plots in their own fashion, an explicit recommendation of 4-H. During my time at NPS, 4-H club students were not permitted to carry out farm work on their own garden plots independently in small groups. Instead, NPS teachers gave students daily work orders that they had to obey or face punishment. These procedures were enforced by year VI student leaders, who monitored the work, as illustrated by the following example:

At the midday break the students at NPS were lined up as usual in the field behind the school. A year VI boy leader named Shadrack Cristephe was walking up and down the lines of students like a drill sergeant. He eyed each of the students severely and kicked their feet or pushed them if they were not standing in a straight line. He called out, "Attention!" They responded by saying, "One!" and then he said, "Stand at ease!" The students responded by raising their right feet and setting them down in order to stand in an alert military fashion. The monitor suddenly started pushing a year V girl up to the front and she resisted by pushing him back and trying to return to her place in line. When teacher Aneti Elisa came out, this monitor told her that this girl was talking. The teacher told the girl to come up front and she was whipped on the hand three times with the switch that the teacher was carrying.

This excerpt illustrates that students were not given autonomy in making decisions in growing crops on their own farm plots. Rather, it suggests that they conducted their work on the farm out of fear of facing punishment for non-compliance.

In interviews with teachers at NPS, they justified the giving of orders as a way to deal with having large class sizes. Below in an interview with the male NPS teacher Fuatael Mlay, a teacher expressed a widely held view of teachers at both schools:

Teachers have to give orders because kids are kids. Teachers have big classes.

Not all students see working in the garden as important. Some do not work.

Teachers have to oversee their work.

This constraint of order giving was believed to be best practice by many teachers that I interviewed. In interviews I asked teachers at both schools to explain their reasons for giving orders to students as their preferred instructional method. Giving orders was seen by teachers and parents at both schools as having value in terms of time management and obedience of students in carrying out work responsibilities, as demonstrated by this statement from the FPS head teacher, Gipsam Mlay:

If [the students] do not get orders they will not do work. Some do not want to do work. Many do not like the work that they have to do in the garden.

And this comment from the NPS former chairperson, Otto Moshi:

Teachers lose time if they do not do this. There is a schedule that they must follow. Teachers need to divide up work. Lazy kids will play instead of working.

As you can see, teachers felt that order giving was an appropriate method of instruction for getting students to fulfill work duties effectively.

Exceptions to order giving. The teacher farm coordinators at FPS and NPS (as opposed to the regular teachers) I observed often spent additional time carefully giving instructions to their students and exhibiting kindness during their interactions with them. From the interviews I did, it seemed that this was because these coordinators appreciated

farming and recognized its value. They were dedicated farmers back home with decades of personal experience. Many had studied in agricultural colleges.

Teachers in charge of agriculture at FPS and NPS made a real effort to teach their students agricultural skills, using methods they believed to be effective. The reasons given by these teachers for why they adhered to methods of instruction of giving orders in garden activities and occasionally demonstrating how to do so to students was because this is what they were taught to do by staff from the Kenyan Institute of Organic Farming (KIOF) and at the Oikos training centre. In interviews these teachers also said they had experience in trying to fulfill the dual and often competing expectations for teaching agricultural skills as well as their regular classroom duties.

Minimal application of agriculture in classroom subject study at both schools.

A major goal for the donor-supported cultivation programs at both schools was for students to gain knowledge in how to carry out organic and modern garden methods at home. But in classroom teaching the teachers at both schools rarely engaged students in learning activities pertaining to agriculture. These were taught in the required school subject studies of work. At both schools I observed the subject of studies of work to be taught only sporadically. One reason for this was because this class was held during the afternoon in the periods after lunch and teachers at both schools often skipped teaching these periods. Another reason was that it was scheduled only two times per week. Moreover, agriculture was only one of seven different topics included in the studies of work curriculum. Other topics included cooking, sewing, masonry, carpentry, and health.

When studies of work was taught, the methods I observed being used by teachers at both schools were having students copy notes written from the board and then

occasionally reading over what was written and explaining the information given. For example, in one seminar I observed the following:

Teacher John Urio filled up the chalkboard and then went to sit in the back of the class. The students were supposed to fill in the blanks in Urio's writing. This was their test and it was written on the board: they must fill in the blanks and answer a few multiple choice questions. Urio then left. He returned ten minutes later and corrected the students' work individually. After that the class ended. Teachers at both schools reported that they found it to be very difficult to teach studies of work because they had not been given any training by the TMEVT on how to do it. One reason for this is that studies of work was introduced only a few years ago, in 2005, when the national curriculum was reformed. This constrained NPS students from achieving 4-H goals because the 4-H farm work generally remained separate from classroom learning in studies of work. Connecting farm work to classroom subject material consistently would support the 4-H goal of having students apply school subject learning—especially in science—in hands-on activities.

Further explanation of constraining factors of 4-H program objectives for NPS students. One of the main objectives of 4-H internationally is for students to keep records in their 4-H notebooks of the profits and expenses incurred for club activities. For example, the 4-H livestock and agriculture notebooks given to 4-H club students at NPS consisted of the following sections:

- genealogy of the livestock they raised;
- the food consumed by livestock over a time;
- animal symptoms and diagnosed diseases and treatments;

- livestock raising problems and how problems were solved;
- length and diameter of a tree planted over time;
- leadership positions held by particular students (chairperson, vice chairperson, secretary, treasurer) in their 4-H club;
- club meeting notes section;
- special activities section (date, happening, participants), and
- records of times when 4-H advisor visited their 4-H projects at home.

When I conducted research at NPS in 2012, I found that these 4-H notebooks were no longer made available to 4-H club students at NPS. The 4-H teacher coordinator at NPS confessed that students had not used 4-H notebooks since 2007. She reported 4-H schools were no longer provided the notebooks, and they were not available unless the school staff raised enough funds to pay for the notebooks themselves. Despite the school raising substantial profits in its farm activities, she stated that the school did not have enough funding in order to be able to purchase 4-H notebooks. Thus, in terms of pedagogy, use of garden produce and keeping records, the school abandoned indicators that were not concerned with the prevailing practices and expectations discussed in chapters 3 and 4. However, as this reveals, pockets of opinion in favor of 4-H practices remained after they were given up by others.

Overall, though, during my time spent at NPS, which was six years after funding for the 4-H program at NPS was halted in 2006, I observed that many of the procedures used during this period acted in opposition to the goal of 4-H programs internationally of engaging students actively in hands-on science learning. For example, after funding for NPS' 4-H club program was stopped in 2006 by the 4-H headquarters, NPS students

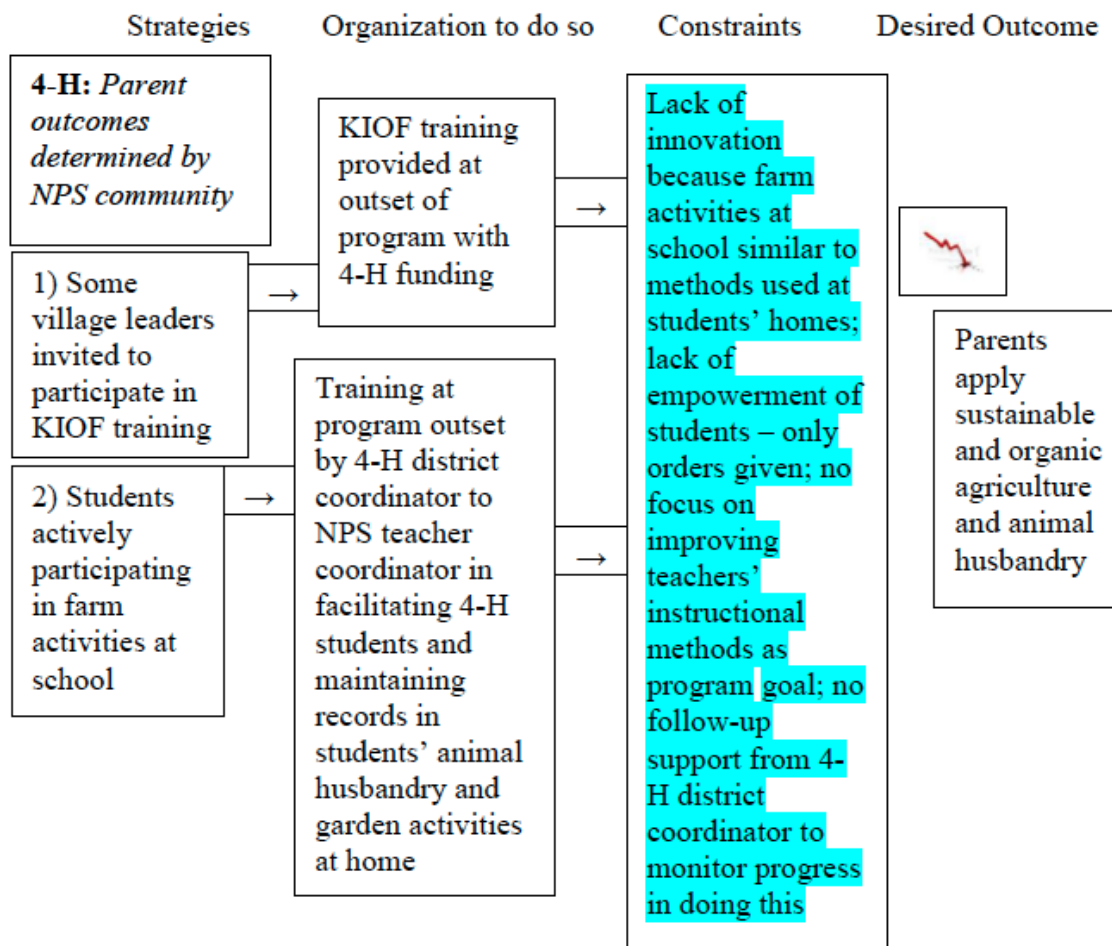
neither worked on their own individual garden plots nor sold produce independently in order to make a profit, which the 4-H student government would have been able to decide how to spend. Instead, the nature of 4-H garden work was that year VII and VI male students were ordered by NPS teachers to carry out specific work in the garden, facing punishment for non-compliance (refer again to Figure 22 in blue box under “constraints”). The agricultural teachers played a more active but limited role in overseeing the student work on the farm. During harvest time in the months of April to May, a few student leaders were selected by teachers to sell their produce to the community at the midday break time.

Explanation of Constraints in Chain of Influence for NPS Adult Villagers

Figure 23, is the same as Figure 16, “Constraints in chain of influence for NPS adult villagers,” with the difference being that the constraints for the project are included here. For the two chains in Figure 23, the desired outcome that villagers were able to apply sustainable and organic agriculture and animal husbandry methods was constrained because of the minimal innovation of the agricultural methods applied at school and the lack of focus on improving teachers’ instructional methods and improving the empowerment of 4-H club students due to no follow-up support from 4-H district coordinator after the initial years of the project.

Figure 23. Constraints in Chain of Influence for NPS Adult Villagers

Goal: *Change agricultural knowledge and practice of adult villagers in applying sustainable agriculture and animal husbandry methods*



A main goal of the 4-H program at NPS established by NPS teachers and community leaders at the program's outset was for families in Nyota village to learn innovative and sustainable agricultural methods. Methods for making organic pesticides were taught extensively over a six-month span to teachers and community leaders in Nyota by staff from the Kenyan Institute of Organic Farming with 4-H support. However, in my interviews with NPS parents, they did not report that they or their

families were applying any innovative agricultural methods taught to them by NPS students, such as using organic pesticides or collecting particular plants growing organically on their land that could be fed to their livestock (see Figure 23 above in shaded blue box under “constraints”). Although they could have learned from NPS students or from KIOF staff and then failed to use such organic methods, the reason they gave for not doing so because there was little incentive for families to apply organic methods in their households. This was because the price for organic vegetables in Nyota village was reportedly the same as for other vegetables. In fact, NPS teachers reported that often villagers demanded to pay less for the organic vegetables sold by 4-H students at NPS because these vegetables were typically smaller than other vegetables sold in the market, to which store-bought pesticides had been applied.

Another reason given by NPS parents for why they had not learned any new agricultural knowledge or techniques from their children was that the farming methods practiced at NPS did not differ from the methods practiced in households within the community. Specifically, it was stated that NPS adhered to methods of production practiced by the Chagga ethnic group in this area, such as growing bananas and coffee together, feeding slices of banana trees to cattle, and applying cow manure in the planting of corn and bananas.

Hence, although the goal of the 4-H program at NPS was to diffuse agricultural knowledge to families in order to improve sustainability and productivity, the data collected supported that little progress had been made in this area (see Figure 23 in shaded blue box under “constraints”). Although I observed that NPS did use organic farming methods (aside from purchasing non-organic seeds from stores in the village or

in Moshi town), the majority of families of students at NPS reported that they were not aware of the nature of the 4-H club at their children's school nor did they know of its focus on improving environmental sustainability in their community. The lack of knowledge about the 4-H club at NPS among adult villagers was a likely consequence of there not being any follow-up provided from the 4-H district coordinator for Moshi Ndogo District (see Figure 23 again under "constraints"). As addressed earlier, the reason for this failure was because funding was no longer being provided by the 4-H headquarters or by the Moshi Ndogo District in order for the 4-H coordinator for Moshi Ndogo District to monitor the progress of the 4-H club at NPS.

Conclusion

The 4-H and Oikos projects fell short in both schools in achieving their goals of improving agricultural knowledge and environmental sustainability. This was because both schools experienced the same problems and obstacles as follows:

- disproportionate allocation of time to garden work in lieu of school subject study;
- failure of teachers to adhere to classroom schedules;
- reliance on order giving as the main instructional method used in classroom learning and farm activities for students;
- lack of initial and ongoing training for teachers on facilitating garden activities using active pedagogical methods;
- chronic teacher absenteeism from teaching duties and interactions with students;
- lack of follow-up by donors, especially in terms of technical support;
- weather and climate conditions;
- minimal innovation in agriculture;

- lack of emphasis on empowerment of students;
- minimal support for diffusion to households;
- funding running dry (4-H);
- no follow-up on achievement of objectives (4-H);
- no buy-in from community, including the active sabotage of farm resources and water supply by particular villagers (Oikos);
- no set goals or benchmarks on a programmatic level; and
- no follow-up from district coordinator (4-H).

The two school cultivation programs at FPS and NPS had the same objective of improving agricultural and environmental sustainability in each rural community. One major difference between the two programs was how the program objectives and strategies for attaining these were determined at the program outset. NPS teachers and parent committee members were involved in how the program was organized and deciding its objectives, whereas FPS parents' committee and teachers were involved at the program outset only during seed selection.

These differences in approach were caused firstly by the model that each of the NGOs decided to use. 4-H programs are structured so that the participants decide the approach that is taken. With the exception of the international 4-H objectives of (a) empowering students to maintain their own records of costs incurred and revenues made and (b) for teachers to facilitate 4-H club activities where students are actively involved in directing their own learning activities, the objectives for the 4-H program at NPS were entirely decided upon by the community. This is in contrast to Oikos, which had specific items on its agenda that they required the FPS community to follow. The only community

input allowed was the FPS parents' committee's recommendations about seed selection, but as we saw, Oikos coordinators did not allow them to choose seed varieties that they anticipated would be problematic in terms of sustainability or teacher behavior.

As mentioned in chapter 5, the 4-H programs were earlier introduced at FPS and other schools in Mchanga village, but were cancelled due to lack of progress. As a likely consequence of the 4-H program having failed in Mchanga, the Oikos program staff responded by establishing set objectives for their school garden programs in Mchanga, including improving nutrition and promoting sustainable agricultural skills. If the 4-H programs were introduced in Nyota and Mchanga at the same time, why were the 4-H programs pulled in Mchanga and not at NPS? Some reasons I found that the 4-H program continued at NPS despite the funding being cut in 2006 was because there is a major difference in receptivity between the communities in terms of support of schooling and school cultivation programs. At NPS, it was reported that there was a long history of school farm activities back to the year 1978 and a history of financial support from the community for schooling and school activities fostering work ethic. Parents valued the NPS farm activities because students gained important agricultural skills which could be applied in their work back at home and in the future.

Despite both donor-supported programs falling short in achieving their goals, stakeholders in both communities reported that the programs at both schools were effective in meeting their expectations that teachers should engage students in developing work ethic, actively carrying out garden work independently, and learning how to save money in agricultural activities by making and applying natural fertilizers and pesticides. This was viewed by stakeholders in both communities to be advantageous for students, as

they would be able to supplement the meager salaries that were expected in future years. However, although parents supported their children's school and its teachers because they felt that they were meeting these expectations, student engagement in these areas was limited because teachers commonly remained aloof while students were required to engage in labor.

Similarly to the Oikos intervention in seed selection, the 4-H garden program may have also created tensions between the program and stakeholders by calling on teachers and students to allocate more time to preparing school gardens and lunches. Some of the minority points of view, which indicate opposition by some community stakeholders to teacher and student time designated to work in this area in lieu of being taught school subjects during scheduled classroom instruction time, will be discussed in chapter 8. The next chapter will also highlight how certain villagers were supportive of the active involvement of students in school farm programs and also in school subject study while being outspoken about the pitfalls of the traditional rote teaching and learning practices at their children's schools, such as centering teaching and learning around test preparation. These differences will be examined in order to gain an understanding about how the ideas and viewpoints of rural villagers have changed in Tanzania over time but also what enduring expectations for the delivery of educational services in their community have been maintained.

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CHAPTER 8

Diversity in Thought and Action: Chinks in the Authority of the Status Quo

Literature about schools in African settings has the tendency to over generalize, asserting that schools in these locations are places where students do not do much of anything except copy, memorize, and prepare for examinations (Leu, 2005). The general expectation is that students and teachers focus on preparing students for exams by writing down information given by the teacher and then studying what they wrote. Much importance is reportedly placed by school staff and communities on students' ability to do well on their examinations because the ability to succeed on tests determines whether students are able to advance to higher levels of education or not.

Literature on African schools also has given the impression that there is a lack of knowledge or understanding about opportunities for reform among parents, students, teachers, and principals, ideas that challenge the dominance of rote learning and prevailing teacher habits in their schools (Heneveld & Craig, 1996). The research portrays African schools as having a learning environment with a teacher-centered pedagogy where students are expected to be passive recipients of information (Adams, Clayton, & Rakotamanana, 1993). What has remained understudied is whether other views about effective methods for teaching and learning and the value of schooling co-exist in African communities with possibilities for influencing change in the future.

In this chapter, different views in the two communities about effective methods for teaching and learning are explored. The responses given by teachers, villagers, and students about the farm activities and school subject study in the communities where this

research was conducted were found to challenge the typical one-sided portrayal of African schooling communities in the literature. This chapter argues that, like the rest of the world, these villages are embroiled in a process of rapid social change and community members are responding to this climate of change in diverse ways. In interviews, for example, villager responses showed awareness about many educational practices that differed from their traditions, and they have taken this information into account, at least within their own minds. Some of the factors contributing to increased exposure to external information are the following:

- (a) more and more adults are schooled due to the spread of mass schooling in Tanzania because of the massive investment, funded in large part with World Bank loans, in the Primary and Secondary Education Development Plans (PEDP and SEDP);
- (b) communities have become more aware of climate change in recent years and the need for farmers to grow drought-resistant crops due to dissemination of climate information and personal observations of climate change (Msuya & Chisawillo, 2009);
- (c) villagers in both studied communities now use cell phones in order to complete business transactions, they have access to the Internet, and they are even able even to send money via phone through M-pesa and other phone services;
- (d) the NGOs that work in the community as agents of social change, including the following list, which is by no means inclusive, Oikos East Africa, 4-H, MS-Training Centre for Development Cooperation (MS-TCDC), Save The Children in Tanzania, Light in Africa, Rural Poverty Relief Foundation, Tanzania Community

Development Organization, Afrishare Solutions Tanzania, Tanzania

Marginzalized Empowerment Organization; and

- (e) the expansion of free trade in Kenya, Tanzania, Rwanda, Uganda, and Burundi, which has allowed farmers in both communities to sell their commodities across the border (e.g. tomatoes from Mchanga and Nyota to Kenya).

All these changes have allowed villagers to interact with the outside world in new ways, engendering an opening of the channels of communication with outside sources, access to outside information, and interactions with others outside their community. This chapter argues that, because of this change in the villagers' ability to access information, the villagers in these communities are developing a diversity of views about the village and their relationship to the world outside, in particular as related to schooling. The diverse ways in which they think about their village and school may suggest some of the changes likely to take place in the future.

Consensus and Dissent in Perceptions and Opinions About Conventional Practices in Tanzanian Schools

The sections below are categorized according to the prevailing practices and expectations under each of the subheadings. In each section, the diverse views of villagers, teachers, and students about conventional practices in Tanzanian schools are discussed in order to delineate differences in views and activities among villagers.

Defending, Criticizing, and Deviating From Prevailing Practices and Expectations

As demonstrated in Chapter 5, the majority of community members prioritized schools' ability to prepare students for the national exams over all other learning outcomes. Although this sentiment was frequently shared by parents and even teachers,

there were some who felt differently about this focus, as demonstrated by this statement by the NPS veteran female teacher, Mary Jesta Urasa:

All that is done [in Tanzanian schools] is to prepare students to take national exams. All that matters is a certificate, which is attained through taking exams. Few students can advance, so those that do get an opportunity. They will get positions of employment if they study and pass national exams. Schools do not prepare students. After I became an accountant, I suddenly asked myself, “Who am I?” Students are never given the chance to think about the profession they want to do when they are adults and what they need to plan to do in order to accomplish this. But teachers do this in your country.

This section explores similarities and differences between FPS and NPS preparation for tests and differences among prevailing opinions about testing within the two school communities.

The focus on preparation for exams. As we have seen, teaching and learning in Tanzanian public schools is largely shaped by national exam preparation. At FPS and NPS, I found that the predominant practice was for teachers to give students a series of exams each year. However, these two schools were not equally engaged in preparation for exams. At NPS, practice exams were given to students each month, while at FPS exams were given four times per year (mid-year and end-of-term). One typical practice was that classroom work at both schools largely consisted of students writing notes from the chalkboard in their notebooks. Students were then responsible for memorizing this information in order to be prepared for multiple-choice and fill-in-the-blank test items on exams. Students’ exam results were the single factor that determined their grade for each

class subject. The following example is a typical teaching method used at both schools to prepare for such exams:

Male teacher Emanuel Stanley Urrio proceeds to work on the problem at the board by himself. When he asks the students questions, he asks all the students together and they shout out responses simultaneously. However, I observe that only a few students are actually answering the questions that Urrio asks. The rest are writing in their notebooks or looking over their shoulders struggling to understand what is written in their textbooks. After this Urrio gives the students an assignment to work on in their textbooks that is to complete problems #5-10. He then leaves the classroom. The students are alone once again.

I observed that these two schools had high pass rates on their exams in comparison with the average for their region no doubt in part because the students prepared for national tests with school exams. In addition, at FPS, extra school courses were offered for year VII and IV students on Saturdays during the months of May up to September. At NPS, all students were required to take extra courses on Saturdays throughout the year. The mock exams that students at FPS and NPS were given required them to fill in their answer (A, B, C, or D) or write a word in a blank space. Teachers then graded their answers as being either correct or incorrect. For year IV and VII students, additional exams were also given in order to prepare them for the national exam. Among these were district, region, and ward exams.

I also observed that, when students were given their exams back by teachers, they were not given the correct answers and were infrequently provided with explanations about certain test items. When the teacher left the classroom, the students would try to

find out the correct answer by comparing their exams with those of other students. On the math section of school and mock exams at both schools I observed that students who explained how their answer was derived received no partial credit; student answers were graded as being either correct or incorrect.

Prevailing views of parents regarding exams. Parents expressed considerable support for national exams as they currently exist. Criticism of tests came out during only a few interviews with parents and teachers. The significance of the exams for the villagers was as a means by which their families could improve their livelihoods; if their children pass the exam, then they would be able to advance to Form I of secondary school. In interviews the majority of parents predominately viewed the quality of teaching at their children's schools in terms of a limited number of factors, primarily students being able to pass national exams. They noted their satisfaction with the performance of teachers at their schools mainly because they perceived teachers to be dedicated to preparing students for national exams. For example, the former NPS chairperson, Otto Moshi, explained:

The community is satisfied with NPS because the students receive good results on national exams.

This assertion was echoed by the community, as demonstrated by this statement made by a mother of a single parent household at FPS, Aneyise H. Urrio:

At FPS the teachers teach well compared to these other schools. The students pass [national exams].

In general, parents in the two communities felt that national exams were fair. They were satisfied because more students, especially those from low-income backgrounds, were

now able to advance to secondary schools. Parents also reported that it was easier to pass in recent times because of the major increase in the number of secondary schools in each region—and teachers agreed with this conclusion. When they were children, only a few secondary schools existed in Arusha and Kilimanjaro Regions, as explained by the FPS parent of an impoverished household, Brayan Nganyo:

Nowadays it is easier to [pass]. Lots of students pass. I think that is okay to have them fill in multiple choice. They learn well just like before.

Another reason given by parents in support of the exam was that the exam does not discriminate across gender and different backgrounds (ethnic group and religion) because it is merit based. According to the interviews, the quality of head teachers and teachers is determined by the performance of students on national exams. Head teachers have an incentive to ensure that their teachers prepare students sufficiently because, if not, the FPS head teacher reports that they will be embarrassed next year at the annual meeting with district educational leaders where national exam scores are reported.

Prevailing views of students regarding exams. In the interviews, students in both communities agreed that the exams were fair because hard working students pass and students who choose not to study sufficiently do not pass. All students I interviewed agreed with this with no exceptions. For example, this male FPS student from an impoverished household, Gift Urrio, said:

We pass if we remember what the teacher taught us. If we don't remember [the information taught to us] we do not pass. I think it is fair.

And this year VII NPS girl student, Hosiana G. Makundi, in the 4-H club echoed his sentiment:

It is fair. If a student pays attention in class they pass. If they do not then they fail.

I did not have a single student express an opinion that indicated they might not think that the national exam was fair.

Dissenting points of view on the value of national exams. Criticism of the value of exams was a minority view, expressed only in a few interviews with parents and also some teachers. Their criticism was directed towards the structure in which national exams are organized. They expressed how they placed less value on national exams in recent times because of its adherence to multiple choice test items; exams no longer included essay writing nor evaluated student math computation based on the work they showed in their calculations. They also felt that passing national exams had less value nowadays because attaining a secondary school education would not necessarily result in attaining a position of employment in the future.

A minority of interviewees felt national exams were of poorer quality in recent times because the test items were less challenging. They explained that the exam was less rigorous because the content had changed so that the exam is now easier to pass; a very high percentage of students are able to advance to secondary school despite having lower competencies in reading, writing, and math skills. These adults claimed that the exams given to them as children were nearly impossible to pass. The following two quotations illustrate these points of view. From the NPS parent of an impoverished household, Masawe Morera:

I did not pass national exams because our teachers did not teach us well and did not advise us on how to pass. My parents could not pay for secondary school, so I

worked on my family's farm and learned to raise livestock. Later I found work as a house girl. Now national exams are different. Poor children can pass. At my school, parents paid a bribe so their child could pass.

And similarly, from an FPS parent in a single mother household, Veronica W. Urrio:

I took the [year VII] exam in 1993. At that time it was not easy to get into secondary school like it is now. On the test there was not much multiple choice. Students had to explain their work through writing. In history, Swahili, and civics, we had to write essays. In geography and science, we had to write full sentence responses.

Among the minority of parents who were critical of national exams at FPS, Veronica W. Urrio, observed that there was deteriorating competency of students in Tanzanian primary schools due to the format of national exams. She explained that the test nowadays uses multiple-choice items instead of requiring students to write short answers and essays as was done previously on national exams when she was a child. She expressed worry that students no longer were learning how to articulate their responses in written or verbal form due to the omission of such sections on the exams. She felt that written and verbal skills were important for students to be able to secure positions of employment in the future, as demonstrated by the following quote:

The problem now [on national exams] is that students do not write. They do not learn how to explain themselves. Kids need to learn how to explain their thinking. The skill of conversation is necessary for students in future employment and in private relations like in the home and with friends. The problem is that the national curriculum is designed so that students just need to memorize. Teachers

know that the national exam is now just multiple choice. They teach students in order to prepare them for the exam. It is not the teachers' fault. It is the TMEVT. This minority of parents voiced concern that students were missing important components of their education because of test items that were multiple choice and which merely promoted memorization.

Dissenting views and practices of teachers. Although the majority of teachers felt that the exam format was fair and effective, I found that a minority of teachers were very critical of how national exams were designed, organized and graded. For example, Teacher Emanuel Stanley Urrio at FPS contrasted the national exam with his practice of grading students' math exams based on the work they show in their problems:

[Nowadays] the TMEVT looks for the easy way to correct. They allow students to pass that do not understand the content. At FPS on my exams [that I make for my class] I have students show their work and grade them on this. Students before had to show their work and explain their answer and were graded on that. The multiple-choice format of exams was also criticized by the starting teacher, Ngowi Kirenga, at FPS from the Chagga ethnic group:

There are too many multiple-choice questions. Students do not have to explain their work. Students should have to show their work and how they are thinking. I think that the exam should be shorter and the explanations of students should be graded. [Currently the exam] is easy for kids who do not study. They can look at other students' work and copy it. Many just memorize what teachers tell them to and it is easy to fill in.

The former FPS head teacher, Dawson Lemnge, agreed:

Anyone can pass national exams [for year VII] nowadays. Some that do not study at all can now pass. Students with lower scores who are not qualified and do not want to learn now can enter secondary school and are able to advance because the TMEVT lowered the score cut-off needed to pass.

Another FPS teacher, teacher Emanuel Stanley Urio, expressed a similar point of view:

Now students do many different practice exams. Before if you passed national exams you would get a good job. Now if you pass you may not get one. ... Now students just choose A, B, C, D. ... It is easier for students because they just choose the answer.

The current head teacher at FPS, Gipsam Mlay, was very critical of how much knowledge students actually gained by cramming for these exams:

Students copy notes and memorize them in order to pass the exam. This [information] does not stay in their heads. For example, they copy grammar sentences in class in order to prepare for exams. They just learn to fill in words. The exam needs to ask questions that students did not copy from their textbooks. As a result of teachers trying to prepare students for the exams, students just know to fill in letters for multiple choice.

Instead, he said, another approach should be used:

I think the exam could be improved if student work was graded instead of just filling in multiple choice... We used to write essays for national exams because this is good for student learning. Teachers do not have students write essays in classes anymore because they just teach according to the previous national exams

from other years because they know that maybe some of the same questions will be on it.

This former head teacher, Dawson Lemnge, went on to argue for more active student learning:

I do not think that having students copy is the best way for them to learn. It is better for students to do experiments and research. They can then see and manipulate the materials.

As illustrated by the following quotation from Gipsam Mlay, the head teachers at both schools felt that exams were more difficult before under the British system during colonialism and that the quality of teaching at that time was better:

When I took the [year VII] exam in 1965, it was more difficult. There were few lower primary schools [from year I to IV] and, if you passed and advanced, there were only a few upper primary/middle schools. After this there were only one or two secondary schools in each region...many students could not advance to secondary school.

These viewpoints of the teachers at both schools illustrate that there are a number of educators who feel strongly about the lack of quality and attachment to learning outcomes that the national exam encourages.

Dissenting views of students. Although students had little to say that was critical of the exams, they did report that exam preparation resulted in lack of essay writing activities. For example, this year VI girl student at FPS, Happyness Ngowo, shared this statement four months after the new school year had begun:

If students memorize they cannot develop intelligence and cannot understand.

The only time we did a writing activity this year was writing an essay in Swahili class two days ago. We learn better if we write essays. The teachers can use this to see how much we know and understand about a topic.

Another student, a year VII NPS female in the 4-H club, Witness M. Pallagyo, had a similar observation when she was interviewed in March, three months after the beginning of the new school year:

We only wrote one imla (dictation)⁵⁶ in Swahili class that was one page long. I think that it is important to learn to write to understand better what we study. If I were the head teacher at NPS, I would have students write essays more often.

These students reported that they were frustrated by the lack of involvement of teachers in their classrooms and desired more learning opportunities where they could practice applying literacy skills in writing, reading, and test items which gauged their comprehension.

Traditional pedagogical practices. In 2005 the Primary School Education Curriculum (PSEC) used in Tanzanian schools was revised. The new curriculum called for teachers to use participatory and cooperative learning instructional methods as well as competency-based assessment strategies. This was in place of the previous format of the PSEC that relied on the use of teacher-centered methods such as rote instruction and content-based methods of evaluation (Komba & Nkumbi, 2008). Despite this reform of

⁵⁶ Dictation is when the teacher reads a sentence aloud and the students write the sentence in their notebook. The students' ability to write the sentence correctly that the teacher reads aloud is then graded.

PSEC, in my research I observed that teachers at both schools adhered to traditional methods of instruction that were teacher-centered and lecture-based.⁵⁷

Chalk and talk. At FPS I observed teachers generally followed such traditional methods of instruction, and at NPS teachers typically had student leaders teach and lead classes as monitors and facilitators. One example is the veteran male teacher, Fuatael Mlay, who had student leaders copy notes on the board in order for the other students to copy the notes in their notebooks and answer the questions that were given to them.

Reliance on chalk and talk methods of instruction by FPS and NPS teachers was also verified by the head teachers at both schools. Even though head teachers at both schools preferred for teachers to do small group learning, they admitted that there were numerous constraints such as teachers being given inadequate instruction about how to do this and because it was simply easier to rely on lecture. The head teacher at FPS, Gispsam Mlay, elaborated:

The teachers who teach [a given subject] must teach many other subjects. There is a teacher shortage at this school, like most schools in rural areas. We have been given science and math kits by the TMEVT. The teachers do not know how to use these resources. If the TMEVT trained them better, they would know how to use these materials.

⁵⁷ Rote instruction was not the only method of instruction I observed at NPS and FPS. Teacher Angela Phelisian informed me that small group practices in the 4-H program at NPS had been used but were halted when funding from 4-H headquarters dried up in 2007. Presumably, this was because there was no longer any follow-up of 4-H activities at NPS by their district coordinator.

In addition to insufficient training provided to teachers by the TMEVT, he explained that teachers at FPS did not use such methods because of time constraints, large classroom sizes, and because their students were not motivated to carry out work independently:

In class, teachers do not have enough time to have students work in small groups.

This is because FPS students have not developed strong study habits. When they work in small groups they struggle. One or two of the students want to work hard while the others do not. This takes too much time. Time is lost.

These constraints were cited as the main reasons for why teachers failed to adapt to the changes in pedagogical methods called for by the TMEVT.

Predominant practice as viewed by parents and teachers. As the excerpt below illustrates, the predominant view of parents in both communities was an acceptance of lecture-based teaching methods because nearly all students at their schools were passing national exams. To support their position, parents drew upon experiences from their childhood where such techniques were typical. For example, this NPS parent from a typical household said:

This is how teachers have always taught me. This is how teachers need to teach.

Students write in their notebooks what is written at the board so they can study this later. What else can a teacher do besides this?

FPS parents had similar sentiments, as demonstrated by this statement from a parent of an impoverished household:

There is no problem if [teachers] have students copy what is written at the board.

Students understand. There are no other methods that teachers can use.

In general, teachers also reported that there was no alternative to chalk and talk methods of instruction based on the constraints they faced in their own classroom. This included large classroom sizes, limited amounts of textbooks, and time constraints.

Although rote instruction methods were predominately used when parents today were children, change became a possibility after 2005 when the new national curriculum supported participatory management. After that date some of the teachers at FPS and NPS received instruction for one week in cooperative group management. They were expected to train other teachers at their school but reported that they had not been able to do so. They stated that this was because they received very little training in participatory methods—some teachers had received two weeks of training while others only one. When I observed their classes I did not find that they were adapting participatory methods in their own classrooms either. Head teachers described how even when teachers returned to their classrooms after being trained in using such methods, they did not apply them because they were not being monitored and also because of other constraints teachers face (limited time, large class sizes, limited resources). The former headmaster at FPS, Dawson Lemnge, explained:

[After TMEVT introduced the new curriculum in 2005, I] as well as other head teachers in the area along with lead teachers from our schools were provided with a seminar about how teachers should direct group work of students. We learned how students can co-participate and conduct their own research, especially in math and science. Then we were ordered to provide this same training to the teachers at our school. Teacher F and Z did so over a few days. But this was not enough. There are nine subjects that we tried to cover in one week.

The current head teacher at NPS, Valerian Mbise, had a similar view of the situation:

The TMEVT has not provided any training after requiring teachers to follow the new curriculum. We have only received training from our own [Moshi] district. I think that NPS teachers need training about new instructional methods and also in each subject area. The [new curriculum] books [from the TMEVT] do not teach well. It is better for student learning when teachers have them do exercises and activities. But many teachers still just have students copy notes from the board because it is easier to follow this teaching method.

The head teachers at both schools felt that more training in participatory methods needed to be provided to all teachers by the TMEVT, district, ward, and/or teachers at their schools. They stated that there would also need to be follow-up so as to ensure that teachers are implementing such methods in their classrooms. For example, the former head teacher at FPS, Dawson Lemnge, stated that:

We need more training and it needs to be over longer periods of time. We have resources – science and math toolkits – but every month we need to have a seminar. Previously this was done in UNICEF programs [during the period of Self-Reliance]. There needs to be a follow-up.

Teachers at both schools stated that they needed to use these rote instructional methods in order to prepare students to pass national exams. They stated that in order for students to pass national exams they must memorize information from their textbooks because they will be tested on this same information on exams. For example, the veteran male teacher at NPS, Fuatael Mlay, said:

We have students copy because we must prepare students to cram [for exams].

There is a lack of resources to use so we have students copy.

On the other hand, not all teachers feel that cramming is the best method of instruction, such as the veteran female teacher from NPS, Ester Kirenga:

If kids are going to learn more they need to be involved in activities. Many students in Tanzanian schools do not understand because teachers just write on the board and have students copy. The system here supports teachers just to talk so that students memorize information and take the national exams. It is easy for teachers to talk with words. The TMEVT can have teachers teach using activities if they decide to do so.

In addition to the lack of training provided by the ministry, teacher resistance to change was also reported as a significant factor for why teacher methods adhered to rote instruction in lieu of adapting participatory methods called for in their new textbooks after the change in the national curriculum in 2005.

Differences in teaching methods between FPS and NPS. One major difference between both schools in terms of teaching methods was the objectives of the donor-supported programs at their school: while Oikos did not focus on changing teacher pedagogy, a main objective of the 4-H program at NPS was to train teachers to facilitate active science learning among students. Teachers at NPS also reported that in the initial years of the 4-H program students worked in small groups in school gardens and teachers acted as facilitators while students directed their own learning, as demonstrated by this statement by veteran female NPS teacher, Angela Phelisian, the 4-H teacher coordinator:

The 4-H students held a meeting every month. . . The focus of the program at the time was the school garden. An acre of the school land was used for the 4-H club members to grow their own garden. Each student or pairs of students had their own plot of land and decided what to grow on their land. . . At their monthly meeting the students discussed how to use the profits that they made from the program.

During my visit, however, I did not observe deviation at FPS from rote instructional methods aside from a few exceptions. One exception I observed was in a science class given by the veteran male teacher , Robert Kiwelu, for year III students about simple machines. He had students go outside and had them work on raising a large stone using a wood plank and a smaller stone. The students were out in front of the school trying to move a big rock with their hands. None of the students were able to move it. Then Kiwelu showed them that if they put a small rock near the big rock and then wedged a wooden pole in between the small rock and the big rock and pushed that they would be able to move it. He referred to this as a simple “machine” and asked the tiniest girl student in class to try and move the large rock. Remarkably, she was able to tip it over a bit before the rock fell back in its original place. The students then went back to the class and Kiwelu had various students read out of their science books the lesson that he was following. During that part of the lesson, I observed that Kiwelu did not ask any open-ended questions and only asked students for rote responses.

Order-giving as pedagogy. Both NGOs intended for students to develop organic and sustainable agriculture skills so that they could be self-reliant in the future. They envisioned that the application of responsible agriculture practices by villagers in a given

community would cultivate healthy communities where environmental, nutritional, and food security issues were being addressed.

Predominant practice and expectations. Despite student learning of organic and sustainable agriculture practices being prioritized in each community by the donors, however, the students were not encouraged to take initiative at school or in their community in actively learning these prioritized skills. In my view, one reason for this was because members of the community believed that relying on the giving of orders was an effective way to get students to learn. Moreover, parents at FPS and NPS were concerned that young people lack work ethic nowadays and, in the view of most parents interviewed, following orders develops work ethic. This view was based on their own experiences as children, as shared by this NPS mother from a single parent household, Mwanaidi Martin:

Students need to follow orders. Students are lazy. In Tanzania we are accustomed to being given orders. In Meru culture this what we do, too. Now these methods are being questioned by teachers, parents and by the TMEVT... Kids before did work. Nowadays there are good and bad kids, and many talk back. Some just leave and walk around on the street. The modern kid can say, 'No!' It was better before. Kids had to do hard work because they had no other choice; their family would not survive if they did not do their work.

This predominant view of adult villagers that order giving was effective was also supported by the teachers in each community. In addition to stating that students need to be given orders in order to do work, another reason given by teachers at both schools for relying on order giving as the main method of instruction was the lack of training

provided to them. But the former FPS head teacher, Dawson Lemnge, expressed doubts that even more training would be sufficient:

It is true that the training seminars were not enough. But teachers also do not want to change. This is a mistake of teachers. It is because of laziness. The textbooks [under the new curriculum] explain exactly how teachers can organize student group work in their classes. At FPS the teachers began well in doing this after the training [that teacher Emanuel Stanley Urrio and I provided to them].

Then they returned to their previous methods.

The above quote from former FPS head teacher illustrates what I observed during my time spent at both schools: the new curricular manuals distributed to teachers by the TMEVT identified the step by step procedures that teachers must follow for teaching using participatory methods in a given lesson. Moreover, at both schools I found that the schools had both been distributed science kits that included the materials required to teach the particular lessons in the teacher manuals. While at NPS I observed teachers to often use these materials in their science lessons, while at FPS the science kits were never opened.

Dissenting points of view among parents, teachers, and students regarding prevailing pedagogical methods. The support for chalk and talk and order giving among teachers and adult villagers in each community also illustrates the hierarchical structure adhered to within Tanzanian society: students stand at the bottom end of the hierarchy and are expected to follow decrees stipulated by adults such as teachers. At FPS a majority of students said they preferred lecture-based instruction, that is, for teachers to be present in class, explain the work, and show examples so that students could better

understand. Interviews with students indicated that this point of view was consistent with the cultural norm that adults and youth do not interact within these two communities.

Nevertheless, some students wanted change. At NPS they wanted more opportunity to discuss in class, recognizing the benefits of doing so in terms of learning the curricular content more deeply, as an NPS boy student leader in year VI, Shadrack Christepéh, explains:

It is important for students to speak in class in order to learn better. If I were the head teacher at Nyota I would choose to increase the amount of time students get to speak in class because they would learn better.

And, similarly, a male student at NPS in year VII, Hoprey Lenadi Ngomud, said:

Students in class here are supposed to be quiet or we will be hit by a teacher.

We think that we should discuss and debate more in class so that we learn how to lead.

Likewise, a minority of parents and teachers—especially educated parents and head teachers at schools—believed that having students work in small groups and empowering them to conduct their own work while teachers act as facilitators is a more effective teaching practice than traditional lecture-based teaching methods. For example, an FPS mother of a single parent household, Veronica W. Urio, said the following:

Copying is just work. It does not stay in the student's head. Participation of students is better. If students are asked questions they learn better. Not when teachers ask all of the students a simple question and they just shout out a response together. It is better to ask individual students questions and they must explain themselves. Teachers should give students group work and then, after

this, individual work. But many teachers are lazy—they have all learned in teachers' colleges how to lead students in group work and ask them open-ended questions. I learned this. But there is not enough time in each period—only 40 minutes—to do this. Students are quiet in class because they are afraid of the teachers. They will get hit if they make a mistake. That is Tanzanian culture. Students are afraid.

Many of these teachers and parents drew on their own experiences as children. They felt that the instructional practices of having students copy notes did not enable them to learn information more deeply.⁵⁸ They stated that students learn more effectively when they are actively engaged in practical activities, discussion/debate, open-ended questions, and group work, as demonstrated by this statement from an FPS parent from an educated household, Jacob E. Mmbando:

Students do not understand as well when teachers lecture and just have them copy notes. When teachers do that, only 15 percent understand what the teacher is teaching. If teachers had students do activities, 60 percent would understand. Teachers need opportunities to learn how to lead students in doing activities...

The head teacher from NPS, Valerian Mbise, had a similar opinion:

It is better for student learning when teachers have them do exercises and activities.

As well as the former NPS chairperson Otto Moshi:

⁵⁸ For further reference, see chapter 4 under section “Support for schooling and respect for school resources”.

I think that teachers need to ask students questions to learn if the children understand the concepts they have been taught. Having students debate is also another way that teachers can gauge if their students understand.

And some students recognized the same concept, as well, as indicated by this statement from a FPS female year VI student from an elderly household, Nance Makyao:

If students memorize they cannot develop intelligence and cannot understand. But if you copy then later you can memorize it and you can study better [for exams].

These responses show a potential for change because many school and community stakeholders recognize the benefits of teachers applying active methods of instruction. The changes in the national curriculum also support potential change in this area if/when more training and support is provided to teachers.

Corporal punishment.

Differences between FPS and NPS. Corporal punishment was used consistently at NPS, whereas at FPS it was not. As the quote from an NPS mother from a single parent household, Mwanaidi Martin, illustrates below, at NPS parents expressed full support for the use of corporal punishment for non-compliance among students such as those who failed to arrive at 7:15 a.m. daily to do their school cleaning chores:

What else do you do when a child makes a mistake?

Another mother from a single parent household at NPS, Mama Love, agreed:

I support teachers' caning students at [NPS]. This is a necessary way for a child to be disciplined.

At FPS, however, unlike NPS, I did not observe any corporal punishment during my research in the Fadhili community. I found no system for enforcing student compliance aside from having the FPS chairperson, Zablon Nassary, visit the household when students were chronically absent. One effect of not having a system of accountability was reportedly that FPS students often did not attend class on Friday (market day). A minority of FPS teachers reported that a main reason they did not establish a system of accountability at their school for students was because they had so little support from parents; students did not complete work at home given to them by teachers and parents did not contribute funding for school projects, as indicated by this statement from a starting FPS female teacher of the Pare ethnic group, Florah E. Makyao:

In general parents in this hamlet do not obligate their children to finish the homework given to them by teachers. In my classes only a few students complete the work assignments that I give them. My students are not motivated to put forth effort on assignments. This community does not think school work is important. This was one of the reasons why many students scored below fifty percent on end-of-the-year exams.

During my research I discovered major differences in the work ethic and attendance of students at NPS versus FPS. Students at NPS worked hard on their school farm. They arrived consistently on time to class and at the start of the school day. In contrast, at FPS, students often did not choose to do the garden work they were ordered to carry out. For example, one time when I went to work with the large group of boys who were weeding in the garden, I found, as usual, many of them were not doing any work in the garden.

There were a lot of rows that needed to be weeded and very little progress had been made.

Dissenting points of view. Although NPS used corporal punishment more than FPS, a minority of NPS parents said, somewhat surprisingly to me, that their teachers did not hit students as excessively as at other schools, as demonstrated by this statement from an NPS mother from a typical household:

Teachers here teach well and do not hit students too much like in other schools. However, while these NPS parents expressed support for this punishment, a minority of NPS students were concerned about what they considered excessive caning practices applied by particular teachers, as indicated by this statement from a female graduate from the NPS 4-H program in secondary school, Riziki Godwin:

I am scared of certain teachers at NPS who are meaner than others. These teachers punished their students more than other teachers.

And this statement from the head girl student leader at NPS:

[If I were the head teacher at NPS] I would shorten the number of times students get hit by teachers. Teacher Aneti Elisa only hits students three times, but most teachers hit students 20 times or more, especially the head teacher [Valerian Mbise] and the other male teacher [John Urio].

And this statement from the year V boy student leader at NPS, Frederick S. Pallangyo:

If I were the head teacher I would not allow students to be hit by teachers. I would have teachers talk to students instead.

A minority of teachers at NPS also did not support the use of caning as the most effective method of discipline. While some NPS teachers relied on using caning as a disciplinary

measure in their classroom, they felt that alternative disciplinary methods were more effective, as evidenced by this statement from the veteran NPS female teacher, Ester Kirenga:

In private schools in Tanzania students are patted on the back. They learn well and their schools are successful. I think if students are given different punishments like doing work in the farm field this is better.

These differences in community and teacher support of corporal punishment as being an effective disciplinary means for students provides evidence that this an area in which viewpoints may be changing in terms of support for such methods. There is potential for more change, especially in terms of introducing alternative forms of discipline for students through the training of teachers. Since the current disciplinary systems used at both schools rely solely on negative reinforcement, this change could include the training of teachers on how to use positive systems of reinforcement.

Use of time by teachers. Lack of teacher adherence to their classroom schedules was reported by the Oikos school garden coordinator, Claudia Bugiardini, to be widespread in all of the schools where they operated:

In most of our visits [to the 22 Oikos schools in Arusha Region] the teachers are not teaching during teaching hours.

Teacher absenteeism was reported to be an accepted practice throughout Tanzania, as demonstrated by this statement from an NPS mother of an impoverished household, Masawe Morera:

In Tanzanian culture [teacher absenteeism] is considered to be okay.

The above quotations provide evidence that non-adherence to classroom teaching responsibilities was a norm in the majority of the 22 schools in Mchanga where Oikos was conducting its work. The Oikos position on this situation was that teacher attendance at Oikos schools in Mchanga was problematic. They organized surprise visits to the schools and some schools were reported to the district. However, as reported below, no changes occurred after letters were sent out from the district to the schools aside from teachers becoming angry with the Oikos staff, as evidenced by this statement from the Oikos school garden coordinator, Claudia Bugiardini:

We always try to investigate why no one is teaching and why there is nobody in the class and there is always an excuse that comes up. Overall, the quality of the teaching is appalling in rural villages. And of course it is all in their own interests and so [they] go off and take the kids to cultivate their own fields, they take the kids to collect their own firewood, they take the kids to fetch water and take it to the teachers' houses. So, it's a disaster. Yeah, the schedules...we cannot start pushing them. What we did is that we went with the district officers, we organized surprise visits to the schools, and some schools have been severely reported back to the district and letters went out. We didn't see any improvement after that. So, I don't know if that was of any use. I think that they were actually quite angry with us for having done that.

As demonstrated, not only was there chronic teacher absenteeism in many of the schools, but the culture was so tolerant of this teacher behavior that the actions of Oikos were perceived to be threatening when they attempted to remedy the situation.

A major reason given in interviews for the poor attendance of teachers at FPS and NPS was the lack of a system of accountability organized by the TMEVC, district, or Ward in which teacher attendance would be consistently monitored. As the veteran male teacher from NPS, Fuatael Mlay, reported, there was no system in place in Tanzania for monitoring teacher quality, only for assessing the amount of available resources at a given school:

Education officers come to visit our school, but they only look at the environment and pay attention to how many resources we do not have...and report that the availability of teacher housing here is a problem... Also they report that teachers do have enough resources to teach, like textbooks and pens.

In my interviews with district personnel in another region of the country (Lindi Region in southern Tanzania), education officers explained that they were unable to monitor teacher quality because no funding was provided by the TMEVT for fuel costs for educational inspectors to visit school sites and collect data on teaching quality. This is in contrast to the systems of accountability reported to have been established in Tanzanian schools during the period of Self-Reliance. The excerpt below is from an interview with an FPS parent from an educated household, Jacob E. Mmbando, explaining these differences:

I studied in primary school in the early 80s, a time when Nyerere was still president in the period of Self-Reliance. The members of the local government like the ward and district education officers provided support to the schools. The farm coordinator visited often and advised us about our agriculture. Teachers were more skilled because they had two years of training in teachers' colleges in addition to being trained in the [national] army for at least one year.

This statement provides evidence that schools were more systematically provided with support by local education officers during the years after independence whereas in recent times school inspections by them are unsupported by the TMEVT as a likely consequence of the costs incurred for transportation.

Predominant practice and expectations. The majority of parents at both schools were accepting of teachers not being able to adhere to their schedules. They stated that it was standard behavior of teachers in Tanzania to not follow their teaching schedules. They explained how when they were children their own teachers did not adhere to their teaching schedules either; their teachers only taught one to three classes per day. They therefore felt satisfied with teacher motivation at their children's school, particularly because students passed national exams. Parents excused teacher absenteeism because they recognized that teachers were not being compensated sufficiently and had additional duties to carry out.

In short, and as already described in chapter 5, among adult villagers, teachers, and school leaders, the predominant view was that teacher absenteeism was permissible. In particular, all teachers excused their absenteeism as being justifiable. The main reasons they cited for their absenteeism were because of the pressures they faced in the given environment in which they teach. In interviews they explained that at their schools there was a teacher shortage and, therefore, they did not have enough time to fulfill all of their teaching responsibilities. Teachers reported that teachers in rural schools have to teach more periods than teachers in urban periods. For example, I was informed by a starting FPS female teacher, Ester Ngowi, that "teachers [at urban primary schools in

Tanzania] have only 10 classes to teach per week. I must teach 30 subjects per week⁵⁹ at FPS.” Other reasons the teachers gave for why they could not adhere to their assigned classroom teaching responsibilities were: (a) teachers’ meetings held weekly;⁶⁰ (b) the need to make a trip to the market to buy food supplies; and (c) travel to the city (Arusha or Moshi) in order to collect their salaries at the bank or print out exams for students.

The grading of exams by teachers often was done during classroom time and the students were not taught during this time. On one occasion at FPS I observed four full days in a row during which no student was taught and the students merely played outside. On another day at the end of the school year, teachers remained in the teachers’ office for most of the day. The main reason for this was that no lessons were being taught that week and the students were only taking end-of-the-year exams. In the teachers’ office, the teachers graded exams, drank tea around 10:00 a.m., spoke with parents of children who had not contributed corn and beans sufficiently for the school lunch, and chatted in a relaxed fashion among one another.

Differences between FPS and NPS. I observed this tolerance for teacher absenteeism at both FPS and NPS: the majority of teachers stuck to their classroom teaching schedules only insofar as these duties were enforced by the head teachers at their schools. At NPS, for example, the majority of teachers appeared to adhere to their schedules as long as they were required to do so. For example, I observed that when the

⁵⁹ The subjects the starting female teacher at FPS, Florah E. Makyo, was scheduled to teach each week, second semester 2011: (a) math, year IV, 6 subjects; (b) Swahili, year V, 7 subjects; (c) Swahili, year VII, 7 subjects; (d) English, year VI, 6 subjects; (e) history, year IV, 2 subjects, and (f) physical education, year IV, 2 subjects. The total subjects per week equaled 30.

⁶⁰ See chapters 4 and 5

bell was rung by students to announce that a particular class period was finished the teachers did not respond to the bell immediately; but after a few minutes they would begin to rotate to the next classrooms where they were supposed to teach. I also observed that whenever the NPS head teacher was not present, the NPS teachers often remained in the office instead of teaching their assigned class periods.

One of the teachers I observed to be chronically absent from teaching responsibilities at NPS was the veteran male teacher John Urio. My conversation with him revealed that he often did not adhere to his classroom schedule for teaching. When the conversation turned to teacher absenteeism at primary schools in Tanzania, Urio completely covered his mouth with his hand and looked away from me without making eye contact. I tried to make my questions as soft and non-abrasive as possible so that he would not feel more uncomfortable. Although I did not ask him about NPS, Urio said, “We cannot teach when we have meetings. We are required to attend the meetings. I cannot always follow my schedule. For example, when there is a day for planting corn or harvesting corn, I cannot teach my classes in the afternoon.”

Although teacher absenteeism occurred at both schools, the two schools differed in their adherence to the teaching schedule, and at NPS there was more adherence than at FPS. One factor that explained these differences was the power of the head teacher to control classroom attendance of teachers. At FPS the head teacher, Gipsam Mlay, adapted a laissez-faire environment where teacher absenteeism from classroom teaching responsibilities was only mildly addressed through “speaking” with teachers. He admitted that he was only able to give teachers stern warnings because he was unable to require teachers to adhere more diligently to their schedules. He claimed that, as we have

addressed, if he chose to be strict with his teachers, the teachers might decide to leave his school and he would not be able to replace them.

The weak powers of Gipsam Mlay in controlling teacher behavior at his school contrasted with the policies of the head teacher at NPS, Valerian Mbise. Mbise stated that he could have his teachers replaced by the district after giving them three stern warnings. As long as he was present at school I observed that NPS teachers would more diligently adhere to their schedules. However, when the NPS head teacher was not present due to being busy with other responsibilities outside of school such as his attendance at meetings in Moshi town, I observed NPS teachers to significantly deviate from their assigned teaching schedule.

Unlike other schools I visited, I found that the attendance procedures adhered to at NPS were an exception. I observed that at NPS teachers were required to sign an attendance book located in front of the head teacher's office at the beginning of the day and also write down the time of their arrival. They also needed to sign their name on an attendance sheet for classes they taught which were maintained by student-leaders in each class. I observed, though, that often times the teachers arrived late to teach their class but still signed their name on the attendance sheet or entered the classroom the next day to sign their name on the attendance sheet for the day before.

At FPS, in contrast, I observed that the head teacher did not have any procedures in place for ensuring teacher attendance. On particular days when I shadowed individual teachers at FPS, however, I found the four female FPS teachers to be more diligent in their teaching than the male teachers there; they were generally teaching in their

classrooms throughout the day during the assigned time that they were supposed to be teaching.⁶¹

Dissenting points of view. A minority of parents recognized the importance of teachers following their schedules and admitted that problems arise when they do not. These respondents stated that they did not support teacher absenteeism from classroom responsibilities, particularly when they turned instruction over to students.⁶² The following statement from an FPS parent of a typical household, Elinami K. Shayo, exemplifies this sentiment:

When teachers turn instruction over to students these students will fall behind, especially the less talented ones, because the student who teaches will make mistakes. When teachers at NPS have a meeting I think it is better for teachers to be in class than in a meeting. A few of the teachers could rotate supervising the classes while the rest of the teachers continue with their meeting in the teachers' office.

This statement of Masawe Morera, an NPS mother of a typical household of a year VI student leader, was in concurrence:

These students will fall behind, especially the less talented ones, because the student teaching will make mistakes. When teachers at NPS had a meeting it is better for teachers to be in class than in a meeting.

One external factor helping to explain why some parents in the village were now placing more emphasis on good attendance by teachers was because they wanted their children to

⁶¹ See chapters 6 & 7 for a breakdown of what these teachers do on a selected day during the school year.

⁶² See chapter 4 for further reference.

be prepared with skills that would make them competitive in the job market. A reason given by parents for this was that trade between East African countries was opening up and there was more competition for jobs. For example, it was reported that south of Nyota village in the village of Himo, Kilimanjaro there was a private school where all of the teachers who were employed were from Kenya; they were said to be hired because they had strong English skills. A minority of NPS adult villagers wanted teachers to be in the classroom because they wanted their children to be prepared with skills that would make them competitive job applicants, as demonstrated by this statement from the NPS veteran teacher, Fuatael Mlay:

NPS students need to be prepared for future employment in East Africa by studying science, math, and English. Work is difficult to get now, even more than when I was growing up. These are the most difficult subjects. If they learn these areas well they can get better jobs like a doctor, engineer, or veterinarian.

Nowadays we outsource to get employees from other countries who are more qualified than ourselves because our students are lacking in these areas. If you just study Swahili you cannot get other employment. If you study other languages like English and French you can. Science is important because students learn about technology.

There were differences between each community in support of teachers being absent: NPS parents supported teacher non-attendance at their children's school while some FPS parents did not. While NPS parents in general supported teacher practices at their children's school, a minority of FPS parents stated that teacher absenteeism is a problem and that teachers should be following their schedules so that students can learn.

They felt that teachers had a responsibility to remain in their classrooms and teach their students. They pointed out the lack of development of a sense of responsibility among teachers for the importance of teaching their students.

These dissenting views were found among FPS parents who were more educated and/or who had experience participating in business transactions outside of their region. This included FPS typical parents, such as a farmer involved in the tomato trade with Kenya, Elly Mshana, who said:

[I]f I were the head teacher I would order them not to have teachers' meetings during school hours. They can hold meetings during school breaks. Teachers do not understand that they have a responsibility to teach their students. There is lack of supervision from the TMEVT for teacher accountability.

And another parent, Edson Lemnge Moshi, who was an educated Lutheran pastor in the FPS community:

...[T]here should only be a teachers' meeting one time per month or every other month. The teachers [at FPS] are in their office without following their schedule. At some [other] schools [here in this village] the teachers cancel school on Friday in order to go the Mchanga market. Teachers are also absent on Fridays and Mondays because they go away for the weekend. A main reason for absenteeism is because the head teacher does not supervise the teachers at their school.

These adult villagers in FPS were critical of teachers, but recognized that the lack of responsibility among teachers for fulfilling their classroom duties was due to constraints they faced by being paid low salaries and also because of the lack of supervision of schools and their teachers by the TMEVT.

In interviews with students, it was found that they were reluctant to take a stance declaring that they disapproved of teachers being absent from class. Although most students were careful not to criticize their teachers, there was agreement among students in preference for teachers to be present in the classroom. However, a minority of students at NPS said that they were content with teachers not being in their classroom because this was good training for them; they felt that as students they would need to develop strong independent study skills. This was because they anticipated that their teachers in the state secondary school in Nyota would not be in the classroom teaching them very much either, as demonstrated by this statement from the year VII NPS 4-H student chairperson, Shadrack Christepheh:

It is okay when teachers turn over instruction to students because we learn “self-reliance” skills. In secondary school there are classrooms with sixty to eighty students and teachers often are not there. It is good for us to learn how to teach ourselves now.

Although no students went so far as to say teacher absenteeism was a problem, upon further probing some of them stated that they preferred for teachers to be in the classroom rather than not in it. For example, a year VI Chagga boy student at FPS said that teacher truancy resulted in him learning ineffectively.

Student absenteeism. As demonstrated previously, cultural practices and expectations surrounding student attendance often interfered with the fulfilment of objectives set forth by the NGOs and occasionally the community.

Differences between the two schools. The predominant practice for monitoring and enforcing student attendance was observed to be different at both schools. Student

attendance at NPS was punctual, whereas at FPS, students often did not attend school. This was especially the case when school lunch was no longer being served at FPS during the rainy season drought and many students stopped coming to school.

One factor that helped to explain this difference in student attendance was the amount of control teachers could exercise at both schools. There were consistent norms at NPS; students who were off-task were reported to their teachers and were punished. It was up to the teacher how many lashes they decided to give out to off-task students. At FPS, on the other hand, it was found that there were inconsistent norms for punishing students. Teachers individually chose when and how much to yell at misbehaving students. Although it was reported by FPS students that they were occasionally caned by teachers, I never observed this.

Dissenting points of view. While NPS adult villagers who were interviewed supported the use of caning at their children's school,⁶³ there was a lack of strict punishment procedures at FPS. One factor which explains this was that teachers at FPS did not have the full support of parents. For example, some teachers, like the two young female teachers from the Pare and Chagga ethnic groups, Florah E. Makyao and Ester Ngowi, reported that there was little support from parents and that parents felt free to pull students out of school in order to farm tomatoes. Teacher Makyao at FPS said:

In general, parents in this hamlet do not obligate their children to finish the homework given to them by teachers. In my classes only a few students complete the work assignments I give them. My students are not motivated to put forth effort on assignments and it is because the community does not value schoolwork.

⁶³ See chapter 4 for further reference.

This is one of the reasons why many students score below fifty percent on end of the year exams.

FPS teacher Juditha Urasa also concurred:

Some youth do not do school work because their parents do not think it is important. Eleven students at FPS failed this year and two [FPS students] failed last year. These students failed because they are lazy or because they care more about making a profit from growing tomatoes.

Farm work was commonly prioritized by FPS families more than school subject study due to the viability of selling the tomato crop. As a likely consequence of the lack of parental support, FPS teachers had to tread carefully and make sure that they were not turned out by the community. There was evidence of head teachers running into problems at other schools in Mchanga because parents were angered by discipline or other school procedures.⁶⁴

Eating what students produce.

Differences between FPS and NPS. At both schools, in general, teachers were cooked a separate lunch from the students. Each month they individually contributed required funds in order to pay for their school lunches. However, there were differences within each community in terms of the school produce that was used by teachers for their own school lunch. At NPS I did not observe teachers or students consuming garden produce; the crops were, in general, sold, while spinach from the corn fields was collected and cooked in the students' lunch of beans and *ugali*. At FPS, on the other hand, I found contradictions between Oikos' overall policy and how it was implemented

⁶⁴ See Chapter 4 for further reference.

at the school. The policy was that school vegetable crops were for students only and not teachers. Oikos had FPS teachers sign a “Memoranda for Understanding,” which illustrated this point to the teachers. However, in spite of this policy, the Oikos school garden coordinator said that Oikos allowed teachers to consume a portion of the vegetables grown in the school garden in order to provide an incentive for teachers, as the Oikos School Garden Coordinator, Claudia Bugiardini, indicated during an interview (see chapter 6, under section A3). I observed that when the Oikos staff came to visit FPS they were also fed vegetables in their school lunch from the school garden along with the teachers, while the students were not fed vegetables that day.

Dissenting points of view. Even though Oikos permitted teachers to consume these vegetables, at least on an unofficial basis, a minority of FPS parents voiced concern that teachers were using the majority of the produce from the school garden in their own lunches. As this quote from this FPS typical mother, Matilda O. Kiwelu, illustrates, they viewed this behavior of teachers to be unjust, especially since year VI students at FPS did all of the labor in the FPS school garden:

It is not fair that teachers are eating garden greens and students are not. The teachers should allow the students to eat this because it is the students’ food.

They did the work. If they do not eat they will not have full bellies.

An FPS parent of an impoverished household, Brayan Nganyo, agreed with her:

If the teachers eat and the students do not then this is bad and is a problem because [these garden greens] are for the students. It is not good for teachers to only eat them and not students.

An FPS mother from a single parent household, Anenyise H. Urrio, was also alarmed:

It is not good. This food is supposed to be for the students.

FPS teachers, for their part, claimed that it was indeed fair for them to consume the garden produce harvested. The major reason given for this was that Oikos had given them permission. For example, Ester Ngowi, a beginning teacher at FPS from the Chagga ethnic group, said:

If [FPS] teachers are going to participate [in the Oikos school cultivation program] then we also need an incentive for producing crops successfully. We work hard to plan, coordinate, and supervise the students in order to ensure that crops are being successfully produced. I think that it is important for teachers too to enjoy the crops that are harvested.

In spite of these differences of opinion among the teachers, the parents, and Oikos, I did not observe any major changes to this policy during my time spent in the FPS community nor did parents confront school and village leaders about these issues in school meetings during my time spent conducting research at this site.

Students being pulled out of class.

Differences between NPS and FPS. The predominant practice at both schools was that it was permissible for students to be pulled from classroom work when there was labor that needed to be completed around the school. The predominant view at NPS among parents was that students should be studying during scheduled classroom time but that it was permissible for them to do so some work chores around the school as necessary, such as cutting vegetables for the school lunch (girls) or clearing manure (boys). In contrast, the predominant view of FPS parents was that they felt it was okay

for girls to be pulled from class to do kitchen work because children needed to help teachers with work jobs around the school.

Whereas FPS teachers consistently pulled females from class to work on kitchen duties, at NPS, student work in general was done during break time, and NPS students were expected to immediately return to the classroom after their work was completed. Nonetheless, some exceptions were made. One example is that the “big sister” girl student leader from year VI, Irene Pendaely, was entrusted to go to the market to purchase food for the school lunch and was permitted to miss part of the classroom period in order to do so.

One reason for student adherence to their classroom schedule at NPS was because the NPS head teacher placed a greater emphasis on students remaining in the classroom during scheduled teaching periods. He reinforced teacher adherence to their schedules by giving them warnings and removing them if they did not follow their teaching duties. Students who did not adhere to their classroom schedules at NPS were caned by teachers when they were present or they were reported to teachers by student leaders when they were not. Although NPS girl students helped out in the school kitchen by washing and cutting vegetables, when the bell rang to announce the end of the morning break time, the female students immediately ran to class.

Dissenting points of view. A dissenting view expressed by a minority of FPS parents was that it was not okay for teachers to pull girl students out of class during classroom hours. They voiced outrage with FPS teachers because they were pulling girls out of class in order for them carry out classroom responsibilities. For example, one parent, Jacob E. Mmbando, an educated pastor, expressed the following opinion:

In truth the [FPS] teachers are making a mistake [to pull girls out of class to cook lunch] because these are the children of our community. And the parents contribute beans and corn for school lunch and money to grind it, and we pay for a cook. This is the cook's responsibility to cook, not the students. [FPS] students lose hours of their classroom schedule when they cook. This is not correct, this is a mistake of teachers, the school committee, and the chairperson here.

These parental views in the FPS community show how consistent rules and procedures for enforcing student attendance is a potential area for change because many parents at FPS expect student attendance to be more consistently reinforced by teachers at their schools. Their view is that their children all have a right to be educated, whether female or male.

Awareness Of and Attempts at Change

School Gardens as Sites of Intended Innovation

It was the donors' intention for community members and students to learn new agricultural skills that would improve livelihoods. However, this goal was only put into practice in certain contexts in both NPS and FPS.

Acquire new skills.

Differences between NPS and FPS. The villagers' expectation of the garden programs at both sites was that students and teachers would produce food that could be sold and/or consumed by the students and teachers for school meals. This expectation was a likely consequence of this being the prevailing practice in Tanzanian state public schools during colonialism and during the period of Self-Reliance after independence during the 1970s and 80s. However, there were differences found between the two

communities when asked about the skills they wanted the students to gain through their involvement in the program. NPS parents preferred for students to gain work ethic and self-reliance skills, while FPS parents preferred for students to gain agricultural skills that would supplement income. One reason for this difference, as expressed in interviews at NPS, is that work ethic is a cornerstone of Chagga society. FPS parents did not make the same claim about the Meru people; at FPS parents saw the Oikos school garden program as beneficial to students because the students were learning modern agricultural skills that they would be able to apply in farming. At NPS, on the other hand, parents saw a strong work ethic and independent work habits as key to increased income because students would be able to independently conduct farm work effectively later in their lives if they were able to learn these skills during schooling.

Another important difference was that the NPS head teacher, Valerian Mbise, was still following many of the methods used during the period of Self-Reliance in Tanzania. For example, he had a “self-reliance teacher,” who kept track of profits generated by the school, and students were heavily involved in school farm activities. At NPS, teachers were expected to prepare students to pass national exams but they were also expected to foster a strong ethic of working hard so that students would be able to carry out “work by hand” independently at home and in their future. As a likely consequence of the agricultural methods of the Chagga ethnic group being more advanced than in other areas of the country (Smith, 1980), they continued to adhere to the traditional methods used in their community, as indicated by a year VII NPS boy, Shadrack Christephe, who was the student chairperson of the 4-H club:

Nothing has changed in the farm activities at NPS. We have not learned anything different here at school than at home.

This sentiment was echoed by a year VIII boy student from an educated household,

Hoprey Lenadi Ngomud:

I received some education in 4-H about raising chickens, how to make raised garden beds, and measurements between certain vegetables like corn and cabbage.

But my family already was doing most of this and there is no difference.

This focus on farm operations that were unchanged from the standard community approach to agriculture was different than all of the other state primary schools I visited in northern Tanzania; other schools did not stress self-reliance to the same degree as the NPS head teacher did. At FPS, the head teacher, in contrast, was not directly involved in supervising and managing school garden activities. Teachers there were primarily expected to prepare students to pass national exams. For FPS parents, it was an added bonus that the teachers began to initiate a school garden program funded by Oikos. The Oikos program was still in its infancy—it had only been running for two years when I conducted my research there—so the parents did not have much knowledge about the benefits of such a program or what they should expect the school to do in order to have a successful program.

Diffuse new knowledge to parents and start gardens at home.

Differences between NPS and FPS. A main goal of both NGOs was for students and families within the community to apply sustainable agricultural methods back at home. I found that the majority of students at both schools were eager to initiate their own gardens and livestock activities back at home. But there were differences in terms of

the effort put forth by teachers to encourage their students to carry out their own projects at home. At NPS when 4-H funds were cut off after 2005, NPS teachers reportedly no longer wanted to work with 4-H students in carrying out home projects. According to the NPS former chairperson, Otto Moshi:

The 4-H club was started at NPS because teachers there thought that since it was an NGO that they would get more money. But [NPS teachers] lost interest when they learned that the focus of the 4-H club was only on educating students. The 4-H coordinator for Moshi District tried hard. He often came by on his motorcycle. But he did not get support from NPS parents.

Moshi went on to say that although he found great benefit from the 4-H club workshops, the NPS teachers were not interested in participating in such workshops:

I myself took an interest in the 4-H club and even traveled with NPS teachers to Tanga [Region] to the 4-H headquarters in order to attend workshops there. But the NPS teachers that went with me took no interest in the workshops, which were about organic agriculture. They wanted to leave because they felt that there was no benefit for themselves. I felt that there was a great benefit for NPS students in the 4-H club because they learned business skills and also how to use organic pesticides and natural manures. As a community we did research about organic farming. I myself learned that I could greatly reduce the amount of store-bought pesticides I used on my coffee trees by using cow manure.

From this information, it is clear that 4-H was unsuccessful in its attempt to disseminate information into the community. Even the teachers involved in the program were not

interested in learning the information because they did not perceive a direct personal benefit from doing so.

Although Oikos had no specific plans about how to diffuse knowledge to the villagers aside from training village leaders at their Oikos training center above Mchanga, at FPS the school garden coordinator, Aneti Elisa, decided herself to encourage year VI FPS students to start their own gardens at home:

I see the garden as being a learning opportunity for students [at FPS] to teach their families important agricultural skills. I told the year VI students to start their own gardens at home. Oikos asked me to do so when I received training at their training centre in Mgamia.

But, in fact, only 12 of the year VI students took the initiative in implementing their own gardens at home. It was later reported by students that they did so only because teacher Aneti Elisa gave them orders to do so. Some of the villagers also reported that in general FPS teachers had not been successful in motivating FPS students to initiate their own garden projects, as indicated by this statement from an educated FPS father, Yason Mshana:

The success rate at the school is 46% in achieving that goal [of having students start their own gardens at home]. It is better to raise that number to 70%. My son [in year VII] now plants gogwe (African eggplant) and spinach. He uses chicken manure for fertilizer.

The implications of these community perspectives are that without follow-up strategies in donor-supported school garden projects for overseeing the effectiveness of diffusion of agriculture knowledge to the communities as well as providing consistent technical

support, diffusion of agricultural knowledge to communities is likely to not meet donor expectations. In addition, it would seem that these programs need to be presented as personally useful to the teachers involved in training in order to be taken seriously by all teaching staff involved in the program. In reference to the chain of influence diagrams found in chapters 6 and 7, these diagrams would need to be revised in order to address this deficiency. That is, the donors would need to build in specific and consistent follow-up procedures under the “Organization to do so” sections. In neither of the two donor projects was follow-up carried out sufficiently for any of the groups of stakeholders.

Influence views on the future of farming.

Predominant practice and expectations. It was the predominant view of parents that they wanted schools to prepare their children to attain positions of employment in the future where their children would be able to make a sufficient income. Although there was agreement between the NGOs, Oikos and 4-H, on the value placed in the learning of farm skills by students, the majority of parents in both communities placed more importance on the need for their children to continue their education in order to attain employment in positions other than farming. They viewed agriculture as being increasingly less profitable and requiring too much work due to the environmental conditions they were facing such as the lack of rainfall. For example, the parent of one impoverished household in the FPS community, Brayan Nganyo, shared the following opinion:

I want my children to become teachers instead of farmers later on in life. Farming is hard work and there is no profit anymore. My fields of corn and beans dried up this year because of the drought. From my tomato field I was only able to get one

debe (18-20 liters) because of the hot sun. I used a pump from the irrigation canal. Teaching is not as difficult. You just teach children.

Masawe Morera, a mother from an impoverished household in the NPS community, had a similar sentiment:

Nowadays it is too difficult to farm. There is no rain and you cannot make enough money.

Another FPS mother, Kanasia E. Urrio, commented on the negative effects of the climate change:

I do not want my kids to only farm. There is drought. Farming is difficult. They cannot depend on this. This year the rains have come late. The beans and corn have dried up. There is a lot of loss. Farmers cannot make a profit. Yesterday the price of a crate of tomatoes dropped to 3,000 shillings (2 USD) but today it rose to 5,000 shillings (3 USD approx).

However, it was also a predominant view in both villages that there was value in students learning agriculture, but only in terms of supplementing their incomes in future years. Parents viewed salaries in Tanzania to be insufficient and felt it would be necessary for their children to be able to generate income through multiple avenues. They saw the learning of agricultural skills as being valuable because farming could be applied wherever their children lived later on in their lives. Teachers at both schools also felt that learning how to farm was an important skill to teach students in order for them to supplement incomes in later years.

The majority of students also stated that they desired to attain more schooling in lieu of farming as an occupation. The following quote from a FPS year VI student from

the Chagga ethnic group, Cynthia Makata, depicts that she perceives the conditions of farming to be too harsh:

There is hot sun. There is no rain. It is hard work too. My parents plant tomatoes but the hot sun dries them. [The tomatoes] need water every day. There is a drought. They lose in the fields.

An NPS year VII boy student from an impoverished household, Shadrack Christepoh, agreed with her:

You get tired out there...unless you use modern agriculture methods. There is hot sun.... You will not get a good salary and will not make much money.

So did Gift Urio, an FPS year VI boy student from an impoverished household:

I do not want to be a farmer. There is hot sun, not enough water, and no crops. The price of crops like tomatoes has dropped from 32,000 shillings to 15,000 shillings for a crate. If I fail [exams] I will repeat.

Their responses illustrate the negative perceptions that students generally had about farming in each of the schools.

With regard to school farm work, in general, parents and teachers recognized that children were less motivated to do farm work nowadays. They stated that students were reluctant to do so because of exposure to industrialized methods for farming and also because they were given more freedom to be disobedient, as demonstrated by this FPS mother in a single parent household, Veronica W. Urio:

My siblings and I did work in the farm fields with hoes. My mom watched us and carried a stick. We planted corn, beans, and potatoes. If one of us stopped working she hit them. You cannot do this nowadays. Kids before did work.

Nowadays there are good and bad kids, and many talk back. Some just leave and walk around on the street. The modern kid can say, 'No!' It was better before. Kids had to do hard work because they had no other choice; their family would not survive if they did not do their work. If you hit your child they will go to live at a relative's house. Myself and other parents [here in Mchanga] tell our children to finish a certain task. I tell them, 'You need to weed up until the end of that row. When you are finished you can go play.' This way my children can decide if they want to work quickly or slowly. Kids before had to do work. That was the only way to live. There were no opportunities for further schooling after primary school. Nowadays most students just care about continuing their studies. If they do not like what their parents make them do, they can run away to the cities or somewhere else.

Whether viewed positively or negatively, there was wide agreement across parents that it would likely be necessary for their children to pursue education and employment in the cities in lieu of remaining in their village. The majority of parents reported that this was particularly the case if their children continued their studies after secondary school.

Positions of employment within their communities were very limited aside from being a teacher, farmer or government employee. The other reason was because of limited available land for farming in each village. This opinion was conveyed through this comment by Veronica W. Urrio, an FPS mother of a single parent household:

I want my children to continue studying so that they enter universities. If they continue to study they will not find jobs in Mchanga unless they choose to be teachers or they could be agriculture coordinators here for the government if they

study agriculture. I think that it is good for them to live in a different place. If you do this you learn to compare the lifestyle, customs, and culture there and understand the strengths and weaknesses of living in each place.

Across both communities, parents demonstrated such awareness of the future for their children, understanding that many must learn skills to be successful outside of the village to find success as adults.

Differences between FPS and NPS. In Nyota, village respondents spoke about the limited amount of land available in the community and also in Kilimanjaro Region to much more of an extent than respondents in Mchanga village, which is located in Arusha region. For example, Dawson Lemnge, the former head teacher at FPS said:

I do not have enough land for all of my children. I prefer for them to get a job with the government rather than be farmers. Other jobs that pay better are an accountant, teacher, or secretary. Some farmers can be successful, but they now need to study agriculture in order to learn about soil fertility, appropriate pesticides to use, and how to access the market. Out of my 11 children, only two will stay here. I have limited land. The others will get an education and go search for a job in the city. Educated people cannot get jobs here.

This sentiment was shared by Masawe Morera, the NPS parent of an impoverished household:

My first child will go out [of Nyota] and look for work. My second will too...in Nyota we have no land to give to them and there are no business opportunities here. [NPS] only helps them to develop work ethic and to get a good education so that they can get a job somewhere else.

The belief that employment opportunities could only be landed in cities was a view generally held by community members in Mchanga.

At Fadhili hamlet, on the other hand, the importance of getting future employment by passing national exams was weighed against current opportunities for generating income within the community, such as through the selling of tomatoes. FPS parents and their students often valued making money in the short-term more than passing national exams. This income was immediate and more certain, whereas in the long term attaining an income through schooling was not guaranteed. One example of this is that FPS teachers reported that some students chose not to continue their education at FPS so that they could farm tomatoes since they could immediately make money doing so.

Dissenting points of view. Although the majority of parents and students saw little value in farming as a primary occupation, a minority of parents at both schools held a more positive view. The parents who saw value in farming felt that it was necessary for children to study agriculture in higher education institutions. The reasons for this opinion were that they felt that it was necessary nowadays to learn techniques to improve their profits such as increasing yields, conducting farm work more efficiently, storing their crops in order to wait until market demand increases, transporting their crops more effectively, etc. They acknowledged that the preparation of students in their primary school gardens/farms was a good foundation but was not enough in order for students to make a sufficient profit in their future years as farmers. Below is an excerpt from an interview of a typical FPS parent, Elinami K. Shayo, who spoke about the need for students to study agriculture in an agricultural college and not just through their involvement in school farm activities in their primary school:

Nowadays farmers need to study modern agriculture methods like how to use modern seeds and how to use [store-bought] fertilizers in order to increase yields. They need to learn methods for selling their crops in the market. They need to learn to do research and develop business skills and know how to play the market. I know of one young man [here in Mchanga] who studied agriculture in his A-levels. He is very rich now. He transports his tomatoes and corn to Mombasa, Kenya. He has a very successful business. Poor farmers here do not know what to do.

An NPS educated parent, Jesse Martin Nnkini, agreed:

If they are going to be farmers, kids now need to learn about the market. They need to study to have success. The price of crops changes. They need to understand how to store their crops and sell their crops for a good price. It is difficult to be a farmer. The market is unstable. I prefer that my son studies. If he studies agriculture he can learn how to cut corners intelligently. I want him to get his doctorate and study to be a district farm coordinator.

Although parents supported farm work at school, they were aware that students would struggle to make a profit unless they studied agriculture more in depth in further study after primary school.

In either community, no villagers dissented with the view that most students would need to leave the community to pursue employment if they pursued secondary education and beyond. The lack of diversity in responses of respondents suggests that there was acceptance in both communities that, unless students chose to pursue jobs as government employees, farmers, or teachers within their community, those students who

continued their education past primary school must inevitably leave their village in order to seek positions of employment in other regions or in urban areas such as Arusha town or Dar es Salaam within Tanzania.

The predominant view within communities in northern Tanzania was parental opposition to students learning farming and the agricultural skills in state primary schools in Tanzania. Although agriculture has been the main occupation of 80% of people in Tanzania (Official Online Gateway of the United Republic of Tanzania, 2013), the interviewee responses here provide evidence that views about the value of farming as an occupation and the agriculture techniques that students need to learn may be only supported if/when students learn modern agricultural skills through study in agricultural colleges.

NGOs (Oikos and 4-H) as vehicles for change.

Predominant practice and expectations. Both donor-supported programs differed from the prevailing sentiment of the villagers in terms of their lack of support for the traditional agricultural practices in the area. There was agreement across both NGOs that the main objective of their school farm activities was for students and villagers to learn and apply new agricultural skills and organic farming. Yet, although the donors endeavored for students and villagers to learn innovative farming methods, within the programs at each school, the teachers relied on traditional methods with only meager use of new methods.

Differences between FPS and NPS. The ability of teachers to manage their programs successfully was viewed differently by each NGO. At NPS a goal of the school's 4-H farm activities was to make money for the school. Another goal was for

NPS students to carry out farm activities independently at home through their participation in school farm activities. At FPS, on the other hand, the teachers were not permitted to sell their products because they were required to sign a “memoranda for understanding” which declared that the crops were for the consumption of students only and not to be sold to the community.

Hence, there were also differences in the role that teachers and students played in the farm activities. While NPS teachers—and also NPS students in the initial years of the program—were actively involved in bookkeeping and income generation activities, at FPS teachers and students were not permitted to do so. This was a likely consequence of Oikos trying to avoid the misuse of finances by school personnel in their schools.

A great advantage at NPS was that its farm activities were supported through the purchase of crops by the community (bananas, coffee, animals, garden vegetables). NPS generated a substantial profit margin through their farm activities whereas FPS did not generate money at all. From their sale of corn, garden vegetables, milk, calves, and goats in 2011, NPS generated 1,370,000 shillings (\$850 USD approx). These funds were reported by teachers to be used to cover the running costs of the agricultural and livestock programs as well as the purchasing of school items such as notebooks and pencils and contributed to school construction projects like the digging of the pit latrines for teachers behind the school.

Thus, the degree of freedom given to teachers and students in program management may or may not be conducive to school garden program success. The NPS farm activities could be sustainable in the long term because the running costs of the program could be covered through the income generated by the selling of livestock, milk,

and crops. At FPS, if they continued to follow the rules mandated by Oikos, then the sustainability of their school garden activities in the long term would be tenuous due to the lack of means for paying for the running costs such as the purchasing of seeds and garden supplies.

These contrasts between FPS and NPS highlighted above show that there were differences in the processes utilized by the NGOs in each community in terms of the involvement of adult villagers and teachers in the initial states of the projects. These differences in approach were based firstly on the model that the NGOs decided to use. In comparison to the Oikos school garden program, the 4-H program at NPS was innovative because it was structured from the bottom up so that the participants were able to decide the approach that was taken. Aside from empowering students in keeping track of costs incurred and revenues made, the objectives for the 4-H program at NPS were entirely decided upon by the community. Oikos, on the contrary, used a “top-down” approach because they had specific objectives that they required the community to follow. NPS teachers and parents’ committee members were involved in how the program was organized and the definition of its objectives, whereas FPS parents’ committee and teachers were involved only marginally and solely in seed selection. These differences were discussed in more depth in chapters 6 and 7, where it was described how the FPS teachers and community were not involved in the project design but at NPS they were.

There were also differences between the input of head teachers on the project and the teachers’ roles in the start-up. Oikos did not establish any leadership within the community for ensuring water was available to their community or for assessing community needs, whereas at NPS the head teacher and school committee were directly

involved in the decision-making process. Funding for NPS's 4-H program came from the generation of profits through an organic farming program run by teachers at NPS, whereas funding for FPS program came from Oikos. As explained by 4-H coordinator and NPS veteran female teacher, Aneti Elisa:

The 4-H garden program [at NPS] was begun by having teachers and students sell the *mnaifu* (poor man's garden green) and spinach that grew in the school's organic cornfields. The spinach plants growing in the cornfields were never planted. These plants grew in the cornfields because poisonous pesticides and fertilizers are not used there. This was taught to me by KIOF. With these profits we were able to purchase packets of seeds of non-native plants and expand the 4-H garden program.

The 4-H program approach may have been more suitable to NPS because there was a long history of school farm activities there, a history of financial support from the community for the construction of school facilities, and there was support for the community for school activities fostering work ethic. The 4-H program had been previously introduced at FPS and in Mchanga, but these programs were pulled due to lack of program progress within the communities. As a likely consequence, Oikos took the failure of the 4-H program into account when starting their school garden programs in Mchanga (see chapter 6 for further reference).

Another main difference between the NGOs were the student-oriented objectives for each program. On the one hand, the 4-H program called for the active participation of students in managing their own agriculture and animal husbandry projects; empowering students to take leadership roles in garden activities was a main objective of the NPS

garden program supported by 4-H. In the Oikos-supported program, on the other hand, the active decision-making of students was not emphasized and the students' involvement was instead centered on work activities.

Conclusion

This chapter seeks to understand and analyze a diversity of villager views of the value of teaching and learning in their children's lives and the ways in which they see it as advancing or not advancing the future they aspire for their children and their families. It was the predominant view of villagers in both communities to report their students' schooling as positive because FPS and NPS followed procedures that successful schools in Tanzania should follow. The majority of villagers avoided being critical of these schools' procedures and teaching methods because students at these schools pass national exams, students copy notes, students use "textbooks" to do activities, and students are given work to prepare them for national exams. Villagers acknowledged that these schools are a notch above most other schools in Tanzania: students pass national exams and, as an added bonus, there is school lunch offered and students learn farm skills. Evidence from this chapter suggests that the majority of respondents are locked into the perceived success of the schools due to their maintenance of the status quo, as indicated by their support of practices in NPS and FPS schools such as national exam preparation, chalk & talk teaching methods, and corporal punishment that, as the next chapter will argue, are counterproductive and problematic. The responses of parents reflect that the majority may not be aware of alternative methods for students learning more effectively than traditional chalk & talk methods of instruction. Instead, they recognized the

importance of children in their community applying themselves in their schooling in order to pass national exams so as to be able to gain future employment.

However, a minority of villagers questioned these traditional practices used by teachers at their children's school because they felt that students were not learning effectively because these instructional methods center on memorization, and retention of this information by their children is therefore uncertain. Some parents were also strongly critical of teacher truancy and advocated increased teacher accountability. Despite the traditional societal structure in both communities where adult and youth interaction is limited, some parents saw alternative teaching techniques such as using cooperative group methods or hands-on instruction as having much greater benefits for student learning. Comparing their school and community to other regions, villages, and schools, such parents were aware of challenges faced by youth in their community and also of the broader state of affairs, including agriculture, schooling, and employment in their village, region, nation, and in Eastern Africa. Their views on the schooling hint at areas in which these communities and others within Tanzania might welcome and benefit from change. In other words, the information presented in this chapter suggests to me that increasing school resources, cultivating work ethic among students, fostering innovative agriculture skills, generating teacher rapport with students and changing the pedagogical methods teachers use as well as otherwise creating increased opportunities for student engagement in classroom lessons can be promising openings for change.

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CHAPTER 9

Normative Reflections on Diminished Learning Opportunities in the Context of Multiple Expectations for Schooling

In the other chapters of this dissertation I tried to avoid value judgments about the state of education in the two school sites where this research was conducted. These other chapters were instead based mainly on what I observed through my participation in daily schooling activities. The findings were also centered on what I learned about the perspectives of villagers, students, and teachers in interviews and informal discussions. In this last chapter, I return to these findings and make judgments about the impact on the opportunities to learn for students at these schools.

In this chapter I argue that the limited opportunities to learn for students at the two schools in this research are, in part, the consequence of the attempt to fulfill the seven community expectations about schooling highlighted in chapter 5. This is because the expectations in place often detract from or undermine the set of opportunities students have to learn curricular content. Despite the efforts of donor-supported initiatives to change teacher and student practices at the two school sites, during (Oikos) and after (4-H) the NGO's programs, I found that a culture of teaching and learning practices was cultivated where students were given limited opportunities to learn.

Grounds for Satisfaction Versus Dissatisfaction with Schools

Schools, it is widely thought, exist to teach students content in ways that enable them to be functional adults. This is so they can contribute to the economic workforce, meet the challenge of raising families, and become constructive members of society.

This is especially the case in low-income nations where, in general, there is lower economic output and there are many challenges to family well-being and to the functioning of society and government.

The findings in chapters 3-7 of this dissertation revealed that students do learn some important skills in the two public primary schools examined in this research. For example, through classroom learning, students can develop a basic level of reading and knowledge about how to compute basic math problems so that they can answer questions on national, region, district, ward, and school exams. In the school farm and garden, teachers review and expand the agricultural practices that students are already familiar with at home, with limited learning of new agricultural methods and practices. In work on the school farm and gardens, students are able to develop self-discipline and work ethos. These are important life skills, and many children benefit from this opportunity.

But are students learning more than this? Are they learning what they need for their futures? The skills needed to make sense of new material, the ability to think critically about the content being learned, and the ability to apply it in their regular lives are important skills that have been identified as important objectives for Tanzanian youth by the TMEVT in its 2005 reform of the primary school national curriculum in Tanzania. The emphasis on critical thinking is being prioritized more in recent times in Tanzania and in other nations because it is recognized that, through schooling, learners must develop skills for being lifelong learners, especially since new knowledge is doubling at a rapid rate—every 73 days by 2020 according to Bernheim & Chaui (2003). However, the predominant view internationally is that such outcomes are not attained by most of the world's children and especially not in schools in low-income countries.

Nevertheless, in the two communities studied, students, teachers and parents were generally satisfied with their schools because students are passing national exams and the teachers work extra classes on the weekend to prepare students for national exams, facilitate garden and farm programs that are viewed to be successful, procure resources through donors or school income generation activities for the construction of additional school facilities, and are viewed to be more motivated than teachers at other schools. It is only a minority of parents, teachers, administrators and students who are not satisfied with the quality of the educational services provided at the two schools examined in this dissertation. This minority view considers opportunities to learn to be reduced within these schools because teacher and student time is allocated to tasks that attempt to fulfill all the various expectations that villagers and ministries have for schools. That is, test taking skills are prioritized in classroom learning with little to no emphasis on the learning of additional skills, school procedures are enforced which cultivate an environment where students are fearful to participate actively in their learning, children's time is spent on menial tasks to increase school resources and income at the expense of academic learning, and problematic teacher behavior remains unquestioned (e.g. non-adherence to teaching schedules, pulling students out of class for work, and reliance on rote instructional methods). These practices persist despite the Tanzanian reform of the primary education national curriculum in 2005, which calls for teachers to use participatory methods of instruction in their classrooms.

Opportunities to Learn: Issues of Engagement and Quality

Improved student learning depends on adequate opportunities to learn (OTL). A foundational prerequisite for adequate OTL is that both teachers and students are present

in the classroom and the teachers engage students in learning activities for the majority of the day (Abadzi, 2007). In this regard, over the past five decades, efforts have been made to measure and compare educational quality across different schools and nations using defined indices that measure OTL. These researchers have generally defined OTL based on the time allocated for teaching, learning, and different subjects on the curricula (Abadzi, 2007; Bloom, 1968; Gettinger, 1984;). The literature on OTL underscores that there are two major components of OTL: The extent to which students are engaged in learning and the curricular content that is covered during this time of engagement.

We know from the literature and other experiences that engagement in academic learning can be grossly inadequate. Early research by Stallings (1980; Stallings & Kaskowitz, 1974) and Aronson, Zimmerman, & Carlos (1998) conducted in the United States found that much instructional time remains unused due to poor classroom management, teacher and student absenteeism, disciplinary action, and long transition time. Guillies and Quijada (2008) went on to define 12 measurable factors related to engagement.⁶⁵

⁶⁵ Twelve measurable factors related to engagement include the following:

1. Percentage of days school is open
2. Teacher attendance
3. Student attendance per day
4. Percentage of school days available for instruction – takes into account lost time when the school days starts or finishes early, etc.
5. Percentage of student time-on-task – when students participate in classroom instructional activities
6. Equivalent percentage of days available for instruction – This is a summary of 1-5 above
7. Percentage of students with a textbook
8. Percentage of school periods where students are using textbooks
9. Percentage of time spent reading
10. Number of words read of grade appropriate text
11. Class size

More recently, Moore et al. (2012) compared five countries, Guatemala, Honduras, Ethiopia, Nepal, and Mozambique using these 12 OTL-related indices. What Moore et al. found was that, although the schools generally remained open throughout the school year and that the teacher attendance rates were at 87% or higher, the actual percentage of time per day when students were engaged in meaningful instruction fell below 45% for all five countries and was as low as 33% for Guatemala and Ethiopia and 16% for Mozambique. Cumulatively, Moore et al. showed that instruction occurred only as high as 87 out of 192 days for Nepal and as low as 56 out of 180 days in Guatemala. This meant that, on average, less than half of the time available for opportunities to learn was used. The primary reason found for this within classrooms was because teachers were off-task and absent from their teaching responsibilities. Outside of the classroom, this was found to be due to school closure, late starts, extended recess, and teacher and student absenteeism.

Other recent studies by Abadzi, Crouch, Echegaray, Pasco, and Sampe (2005) and Moore et al. strongly indicate that students are still losing important instructional time due to teachers being off-task. These findings provide strong evidence that, despite major educational reforms that have successfully improved access to schooling for students worldwide in low-income nations in recent years, educational quality cannot be improved to the point desired without higher rates of engagement by both students and teachers.

However, engagement is by no means sufficient as a criterion of quality of instruction since what students learn may not prepare them adequately for future

12. School support – number of visits to school by support such as education officials, NGOs and other staff

education and work opportunities. For example, students can be engaged in rote learning, but still may not understand the information taught to them because they are memorizing it without being able to explain the reasoning that defines the concept, what is important to know, and what is not relevant. Or, students may be engaged in rote work much of the time, even when the teacher is out of the room, but only because she or he fears corporal punishment from the teacher when the teacher returns to the class.

Given the data collected for this dissertation, I would argue that the instruction provided by teachers at FPS and NPS in general does not offer students quality opportunities to learn. By quality OTLs, I mean a good chance of acquiring the skills that are prioritized under the 2005 primary school curriculum reform by the TMEVC, such as critical thinking, problem solving, and understanding through students taking an active role in learning through collaboration (i.e., working in groups, presenting), inquiry (i.e., asking questions, conducting experiments), and lines of reasoning (i.e., debating, reflection, sense-making). When judged against the standards required to acquire these skills, the quality of instruction at FPS and NPS schools turned out to be very low during the times when I conducted research in both of the school sites. This was not only because the times when teachers were teaching their students were very limited, but also because when teachers were actually teaching they relied on rote instruction with students at their desks copying information, repeating responses and doing limited tasks where the students were required to remain quiet or risk being punished.

Each of the chapters in this dissertation gives a different perspective on these issues of engagement and quality. Although in some ways they illustrate remarkable efforts to increase engagement and quality, the overall picture is one of diminished

opportunities to learn, compared to what is called for.

Counterproductive Teacher Practices at FPS and NPS

Chapter 4 depicts how, in general, particular teacher practices at FPS and NPS decreased student engagement. It summarizes how the prevailing practice was for teachers to be frequently absent from classes, interaction with students was frequently very limited, students were expected to remain quiet and follow orders given by their teachers, and systems of negative reinforcement reinforced the discipline of students. The overall effect of these practices was to decrease student engagement in learning within the classroom. For example, the duties of teacher farm coordinators at FPS and MPS on the school farm and garden were often prioritized more than teaching students in their class; teacher agriculture coordinators at both schools often left their classroom during scheduled teaching hours to inspect, plan, and facilitate school farm activities. Furthermore, at FPS it was found that the teacher school lunch coordinator chronically left her classroom during teaching hours so as to keep records and follow-up to ensure that each individual student contributed their required portion of corn, beans, and school lunch fees. She also left her classroom duties to oversee that the school lunch was being cooked effectively for students at the school. Since it was not the job of the school chef to cook the lunch for teachers at FPS, she also was responsible for cooking the school lunch for teachers. While her students were left unattended in their classroom during this time, other students were commonly pulled out of class to help with cooking the school lunch.

This chapter also illustrates how the general reliance of chalk and talk instructional methods by teachers at both schools often resulted in teachers giving

students work to carry out while teachers remained aloof. For example, teachers commonly remained either outside of their classrooms where they spoke with other teachers, worked in the teachers' office, or tended to auxiliary duties related to schooling and sometimes to responsibilities in their personal lives. When in classrooms, teacher methods were observed that were commonly centered on having students copy notes from the chalkboard or complete independent work while sitting at a desk in the front or back of the classroom where they quietly graded student work. During observations, it was found that teacher classroom habits did not include monitoring individual student progress on the tasks they had been assigned, nor were they observed to engage actively in assisting students with their work at their desks. Instead, teachers often selected student monitors to oversee work of students. On the NPS farm, student monitors were responsible for supervising student work while teachers infrequently made rounds to oversee the student monitors and the other students in performing their tasks. Their work orders were enforced through corporal punishment. All of these factors provide evidence that schooling practices in both sites cultivated an environment where student engagement in actual learning activities in the classroom and on the farm was very limited. However, many NPS parents and teachers saw the merit in their students learning how to carry out work independently because students developed work ethic and student leaders supervised and taught other students. Many NPS students also stated that they were less fearful to ask questions to students rather than teachers.

Conflicting Expectations for What Schools Should Accomplish at FPS and NPS

Chapter 5 identifies how certain expectations that the villagers and teachers have for how teachers and students should behave and what ends should be achieved at these

two Tanzanian primary schools provide opportunities for or detract from student engagement in learning opportunities. The focus is on how teacher attention and time related to certain expectations reduces or increases the time students spend in actual learning activities. The community expectations are that schools and teachers should: (a) prepare students to pass national exams, (b) enforce school procedures, (c) increase resources provided to schools, (d) equip students with income-generation skills applicable in their future, (e) lead students to stronger work ethic, and (f) villagers and students should give teachers support and avoid criticism.

The primary expectation of teachers and adult villagers is for students to gain sufficient skill proficiency in order to pass national exams. The chapter shows how, in response to this expectation, the majority of classroom time is spent preparing students for national and school exams. It was found that teachers were often in the office preparing or grading exams instead of teaching students during their scheduled classroom periods. At FPS, it was observed that when teachers finished teaching the required academic content deemed necessary to prepare students for end-of-the-year exams, the teachers stopped teaching students during the full month of October. At FPS it was also found that 55 percent of the total scores on end-of-the year exams were considered failing in the classes I investigated.⁶⁶ Since the greater majority of students at FPS pass year IV and VII national exams, this suggests that the FPS students place much less effort on school work and regular classes because they will continue on to later school years regardless of their scores on end-of-the-year exams, whereas they invest their time and

⁶⁶ See chapter 3 for further reference.

effort in preparing for national exams in years IV and VII through extra courses provided at their schools by teachers on the weekends and after school.

Aside from at NPS, where student scores and rankings on exams were posted next to the names of students, few incentives were in place for student achievement of higher scores on exams because they advanced to the following grade regardless of their scores on school exams; the only exams that determined student advancement to upper grades were their results on year IV and VII national exams. The rigor of the school exams was also questionable because a passing score was 40 percent or higher. Furthermore, teachers at both schools frequently skipped the teaching of school subjects that were not included on national exams, such as studies of work and *habari za mchezo* (physical education) while other subjects on national exams were taught more often, including math, Swahili and English. All of these factors show that student engagement in learning activities was limited to exam preparation while classroom coverage of school subject study was designated substantially more to subjects tested on national exams.

The exams consisted of multiple choice questions, true/false items, and fill in the blank questions. As a consequence of there being no essays or short answers included on the tests, teachers did not teach writing skills at their school. I observed that many of the students at both FPS and NPS were not capable of writing full sentences correctly unless they were able to copy them from the board. Since the exam structure necessitated rote memorization, the common teaching practice used by teachers in their classrooms was to prepare students for exams by writing notes on the board for students to copy at their desks, which the students were expected to study and memorize independently. Students

were expected to learn by rote the content taught to them by teachers, but this information was rarely relevant to the context of the lives of rural students.

For example, I was able to make copies of previous national exams and analyze these exams with other graduate students and faculty at Michigan State University. I gained access to these exams because teachers at FPS had a box filled with copies of the older exams, which they permitted me to access. In a conference call, we analyzed the social studies portion of the year IV exam and the English portion of the year VII national exam, both given in 2010. For the social studies exam portion of the year IV national exam, we found that the questions were decontextualized because they were confined to procedural knowledge of government structures and processes and questions about moral and ethical knowledge; no items were included that addressed the issues relevant to the lives of students, particularly those from rural villages. For the English exam, we found that the test was filled with grammatical mistakes and misspellings but also that the questions had no application to student interests. Instead, the items on the exams were centered on testing student knowledge about grammatical rules and filling in the blank with the correct English vocabulary, many of which had misspellings. Furthermore, the questions after the reading passages on the test did not measure student comprehension about the overall meaning of the story nor did it call on students to make inferences. Instead, the exam simply encouraged students to look back at the text and find the answers quickly.

Although it was the predominant view that that if their children only pass the year VII national exam and continue on to secondary school that all will be well in terms of employment, Vavrus & Ojwang (2013) found that even if students pass year VII national

exams and advance to secondary school that public secondary schools are not producing qualified students because of issues of teacher accountability and the lack of academic rigor in those schools, too. Since even secondary school leavers are academically ill-prepared to secure jobs on the market, then these graduates may only add to the unemployment situation or be qualified for the lowest forms of manual labor or the illegal economy.

The second most prioritized expectation was found to be the need for teachers to enforce school procedures. This was so highly prioritized because it was a way of showing the community and any visitors that the school was being effectively run. The requirement for students to arrive at 7 am each day to assist in cleaning and farm duties around the school was observed to be beneficial in terms of students arriving punctually to school prepared to learn. However, many teachers at both schools were observed to arrive later after students began their required tasks, which meant that this student work was infrequently monitored and guided by adults. Student compliance with these school norms was enforced through punishment: yelling at students at FPS and corporal punishment at NPS. The majority of parents at both schools supported the need for teachers to discipline students. This created the justification and space for cruel behavior of certain teachers, which was particularly reported by students at NPS. At both schools certain students stated that there was a climate of fear where they opted to remain passive in class because they were afraid of being punished if they spoke to their teachers. All of these factors reduced the likelihood that students were engaged in meaningful learning opportunities at their schools.

The third and fourth expectations were to increase school resources and for students to gain income generation skills applicable in their future. These expectations were highly valued because meeting them demonstrated to the community and visitors that the teachers were highly motivated and committed to their students and community because they were doing extra work on top of meeting the primary expectation, which is to prepare students to pass national exams. However, this expectation, too, resulted in reduced student engagement in learning curricular content due to teacher time being allocated to these tasks instead of adhering to their classroom teaching responsibilities. For example, the most effective teachers at each school were found to be placed in the agriculture coordinator position in addition to their classroom duties. It was observed that they frequently left their classroom teaching duties to devote their time to facilitating school farm activities. At NPS, where a main objective of school farm activities was to generate income, often student time was allocated to farming activities in order to make a profit for the school instead of in learning curricular content in the classroom or on the farm. For example, during the corn harvesting time, students at NPS cut down, shucked, cleaned, and replanted corn during 5 out of 8 school periods each day for two weeks. During this time, aside from oversight of students by the NPS teacher farm coordinator in harvesting corn, it was observed that most teachers remained in the teachers' office during times when students worked as laborers.

With regard to the content learned in school farming activities, the farming skills that were learned were those already valued and practiced by the ethnic group in each community. For example, students at NPS were found to have learned how to apply the highly developed agricultural and animal husbandry practices of the Chagga ethnic group

of their community effectively. However, overall there was minimal emphasis on the learning of different agricultural methods or on how to plant different crops than what was practiced in their community.

The fifth expectation was to lead students to develop stronger work ethic. The development of a work ethos was given such an emphasis because it was recognized that, regardless of the nature of their future occupation, students would need to supplement their low-paying salary position typical in Tanzania through hard work in diversified income generation streams. Thus, at FPS and NPS it was found that student engagement in academic learning was decreased because students were often involved in work activities in lieu of being engaged in learning opportunities. In other words, students were often engaged in work activities at school as laborers who followed work orders instead of being engaged in the learning of new skills on the farm or in relation to school subject learning such as in science, math, or studies of work. Often, farm activities replaced regular classroom instruction during times of the year when harvesting or field preparation was required. The majority of adult villagers in each community still supported this emphasis on student labor in school agricultural activities without acknowledging that if students are academically ill-prepared, their work ethic might be good only for the lowest forms of manual labor or the illegal economy. Vavrus & Ojwang's (2013) study found that public secondary schools are not producing qualified students but instead that they only add to the unemployment situation. My study indicates that the problem of school ineffectiveness as far as producing graduates well prepared to find employment is present in primary schools as well.

The final expectation was to give teachers unqualified support and avoid criticism. This led to limited or no questioning of teaching practices at the school by parents and students. This meant that practices that were problematical and questionable were supported, such as teacher absenteeism from classroom teaching, turning instruction over to students, pulling students out of the classroom to fulfill labor duties at the school on the farm or in preparing the school lunch, and excessive punishment. Parents did not question these practices as a likely consequence of their positions in the hierarchy within their community being lower than that of the teachers at their children's school because they were less educated. Also, challenging teachers could be problematical because this could place their own children at risk.

Another factor that helps to explain this lack of criticism was the low expectations of parents for teachers at their children's school. This was because of their schooling experiences as children where many parents reported that teachers only taught them during one to three periods each day out of the eight total periods. This likely led to accepted beliefs about what schools should and should not do and suggests that most parents lacked the knowledge of the components that make for an effective link between school practices and pre-requisite skills for employment in the current and emerging economy.

Changing Expectations and Practices: The Oikos Intervention

In chapter 6 the Oikos intervention is described in detail. It shows how, when the global Oikos objective of encouraging the adoption of more sustainable lifestyles as tools for social development and fighting poverty are pushed forward in schools within given communities, that this often conflicts with student engagement in academic learning.

Although particular aspects of the intervention were found to increase opportunities for students to engage in academic learning at FPS, such as higher student attendance because school lunch was served and textbooks across all school subjects were made available for students, student engagement in academic learning also decreased at FPS due to students having to fulfill garden and lunch work tasks during classroom learning hours, school garden and lunch teacher coordinators often skipping out on their regular classroom teaching responsibilities to carry out these duties, and entire classrooms of students occasionally being pulled out of class to prepare food for the school lunch, such as blowing out debris from the corn and beans that would be cooked. All of these factors provide evidence that the global objectives of Oikos often acted in opposition to the main expectations that adult villagers may have for their schools, which is to prepare students for passing national exams.

Changing Expectations and Practices: The 4-H Intervention

In chapter 7, the 4-H intervention is described in detail. It explains how when the global 4-H objective of improving basic academic skills as well as science and environmental education learning through utilizing inquiry-based experiential methods of instruction are implemented, certain aspects of the intervention may provide more engagement for students while others do not. For example, at NPS it was observed that student engagement in learning modern and organic agricultural and animal husbandry methods was applied in the class subject of studies of work. This was a likely consequence of teacher knowledge in these areas having been boosted due to the six months of training provided by staff from the Kenyan Institute of Organic Farming at NPS at the 4-H program outset. However, engagement in academic learning for all NPS

students was found to significantly decrease at certain times of the year due to students being given orders to carry out farm work. For example, during the two times of the year in which corn was harvested and replanted, students were required to carry out work in cutting down corn stalks, shucking corn, cleaning the debris, applying manure in the fields, and replanting corn. It was also observed that occasionally 4-H students in year VII were pulled from regular classroom instructional time to carry out work in tending the school garden. All of this provides evidence that student engagement was significantly reduced through the teachers' effort to move forward with 4-H farm activities at their school.

Diversity of Perceptions, Values and Opinions Concerning Schooling in the Two Communities

The data analyzed for chapter 8 revealed that a minority of parents were concerned with the limited opportunities to learn given to their children at their schools. For example, while the predominant view was that parents were satisfied with the teaching practices at their children's schools because students passed national exams, a minority of interviewees felt national exams were of poorer quality in recent times because the test items were less challenging. They stated that students were missing out on learning important skills such as writing and discussion and instead were memorizing information for exams that they would soon forget.

Predominately, parents were also satisfied with their children's schools because students were actively working in cultivation programs in which crops were being produced effectively. However, a minority of parents opposed students working on such tasks during classroom time to increase school resources and develop a stronger work

ethic because they felt that students were being deprived of valuable academic learning time.

Also, while parents and students generally supported teachers at their children's schools and did not ask questions about their behavior, it was found that a minority of parents at each school were critical of teacher absenteeism from classroom teaching duties, teachers pulling students out from class, and the rote instruction methods teachers generally relied on in their classrooms because student engagement in academic learning was decreased as a result. What was learned overall from these minority opinions was that these individuals are dissatisfied with the standard practices of education in their village and desire changes in teacher time on-task, pedagogical methods, the nature of student-teacher interaction, and the role of students in their learning.

Unrest with Educational Services Provided

In short, each chapter in this study raises questions about educational quality of public elementary schools in two rural Tanzanian communities. The findings for this study were based on active participation in and observation of schooling activities by the researcher as well as consideration of minority and majority points of view in interviews with local stakeholders. The responses and observations reveal that student learning opportunities were significantly reduced because of the prevailing practices at each school.

Parents who were interviewed had limited experiences in schools and contact with the teachers at their children's school as well as when they themselves were students. In general, they did not understand that the nature of instruction in classrooms, which is centered on rote memorization, may not be conducive to the promotion of real

understanding by students, nor did they raise concerns that drilling for exams may not improve student learning. However, a minority did raise major concerns about these issues. That is, a minority valued the degree to which students are engaged in learning and were critical of the situation of teaching and learning at their children's school.

These findings are consistent with the international consensus that educational quality in rural primary schools in low-income countries is generally not satisfactory and, in fact, has even likely declined in various regions because of the difficulties of schools keeping pace with population growth in sub-Saharan Africa (Glassman, Naidoo, & Wood, 2007). It is recognized that classrooms in sub-Saharan Africa are met with many challenges, such as overcrowded classrooms, teacher shortages, and resource constraints. But addressing the issues of student engagement and the quality of students' opportunities to learn is also crucial in Tanzania and elsewhere.

To address these issues, recent educational interventions have focused more on educational quality. However, even this shift in the focus of educational interventions in low-income nations falls short of what is needed. For example, as chapters 6 and 7 depict, in both the Oikos and 4-H interventions the strategies used have suffered from questionable strategies like too much reliance on teacher training workshops without classroom follow-up and the overall programs have been undermined by lack of teacher accountability.

Examples of Better Opportunities to Learn in Similar Contexts

What follows is the question of how change can take place to address these challenges. The following section draws upon three educational projects in order to explore methods by which to enact viable reforms in improving educational quality in

Tanzania and other low-income nations. It is divided into three subsections of engaging students, changing teacher practice, and organizing to support change.

Engaging Students

In their study, *In-school and out-of school youth learning groups in a rural village in Lindi region in southern Tanzania*, from May to August 2012 I conducted, in collaboration with John Schwille, a pilot project using small learning groups in the environment, health, and agriculture for two primary schools in a rural village in Lindi Region in southern Tanzania (Roberts & Schwille, 2012). For each club 12 students (six male and six female) ages 10 to 15 years old were selected by school leaders and teachers at both schools. A participatory methodology was introduced and lesson activities were carried out, where the researcher co-taught with Tanzanian teachers from the village schools. In August, student groups from each club presented their findings to the students in other clubs. Focus group interviews with club teachers, students, and parents of students were held during the last week of club activities.

For the environment club, the activities included: (a) tracking the quantity of firewood used by club students' families; (b) research on crop yields when using fertilizers; (c) experiments with cooking *ugali* and rice using solar stoves and comparing these stoves to traditional cooking arrangements used by families in the village; (d) a trip to visit the village's protected forest with a representative from an NGO, Reducing Emissions from Deforestation and forest Degradation (REDD), in order to learn about climate change and the advantages for villagers in protecting their forests; (e) a trip to conservation-focused agricultural sites in the village and an adjacent village; and (f) a trip to the August 8th agriculture festival on the coast in Lindi region. For the health club, the

activities included: (a) training on the source, symptoms, prevention, and treatment of malaria, tuberculosis, and HIV/AIDS; and (b) a visit to a hospital in Lindi town to shadow nurses and doctors in their daily work activities. Finally, the agriculture club did the following: (a) research about the types of foods eaten at home and discussion of how to improve nutrition in their diets; (b) research on crop yields when using fertilizers; (c) an experiment on the absorption of water in different soil types (clay, sand, silt) and the effects when fertilizer is added to these soil types; (d) a trip to visit the rice fields of model farmers trained by the Aga Khan Foundation in an adjacent village; (e) a trip to conservation-focused agricultural sites in the village and an another nearby village; and (f) a trip to the August 8th agriculture festival on the coast in Lindi region.

Even in the short time period in which the club activities were implemented, the response of students, teachers, and community was very different from what I encountered in my dissertation research conducted in the northern sites of FPS and NPS; full support for club activities was expressed by the club teachers, head teachers, club students, parents of club students, and seniors in the village. To begin with, the club students unanimously agreed that the education provided during regular school hours was often insufficient. One male agriculture club student shared, “Some days [at our school] teachers do not teach. Other days they may teach only four or five subjects.” And a female member of the agriculture club had a similar observation: “At [our school] teachers teach zero to four school subjects [out of nine] per day. I prefer the club because we learn new skills that come from outside of our village.” Students preferred doing the club activities more than regular school work because the skills gained in club activities

could be directly applied in their own lives, as this statement from a male health club student demonstrates:

I like what we do in the club more than what we do at school. In the club we see and live what we are learning. In school we do not do this. There they only use words and just use books.

A similar opinion was expressed by a male member of the agriculture club:

I prefer the club because we learn non-local agriculture skills. If you fail [in year VII at our primary school] you do not pass [and do not advance to secondary school]. But in the club we learn life skills that we can apply in our life afterwards in order to have a better life. If we fail school we can still use these [club] skills to improve our lives.

This view was echoed by a female environmental club student:

In school we just sit and listen. In the environment club we needed to explain ourselves. I learned more this way.

A male head teacher of the village primary school also expressed that he observed positive effects of club participation for their students such as increased confidence, higher self-esteem, and the ability to provide more detailed explanations:

The clubs have been a great benefit to the students. The students [who participated in the clubs] believe in themselves more now and provide better explanations. It would be great to have even more different types of clubs.

A beginning female environment club teacher agreed with him:

Students [in clubs] are less afraid now. Through using a participatory methodology the students have developed self-esteem. They have learned that

they are able to lead, explain themselves, and be successful. They have become accustomed to this and are doing better work in their regular school subject study.

A veteran male agriculture club teacher also concurred:

The students have become teachers for their parents. At the beginning they could not ask questions. Now they have learned how to do this.

Another beginning female health club teacher described the positive benefits of the students being involved in club activities:

In our own classrooms students do not answer questions because they are worried. They do not love teachers and do not want to work. They come from a difficult environment. Many do not have enough clothing. But in the club activities the students became very motivated. They arrived early to school the day of the club activities...They have learned to believe in themselves.

As supported by the data drawn from interviews presented above, this study sheds light on how introducing educational projects where the active engagement of students and teachers in applying a participatory methodology is continually reinforced can result in positive benefits for student learning and motivation.

Changing Teacher Practice

In my pilot project in southern Tanzania (Roberts & Schwille, 2012), we found that increased student engagement required substantial changes in teacher practices. In working with teachers to shape their pedagogical practices, too, this short project had good results. Similarly to responses from teachers in the sites of my dissertation research in northern Tanzania, club teachers described that, prior to working in club activities from May to August 2012, they had very limited training in how to apply participatory

methods in their own classrooms. One veteran female health club teacher shared the following:

We have not received any hands-on training in a participatory methodology from the TMEVT. We have only been lectured about this in theory and never have seen how it can actually be applied until now.

This sentiment was echoed by a veteran male agriculture club teacher:

We not have received any training in how to use participatory methods. We only have books. This is a major problem. We teachers [in this village] do not know how to [use participatory methods]. And we cannot learn this in only a few days. Some teachers were sent to [a nearby village] and were lectured about how to use participatory methods, but their instructors only taught them by writing instructions on the chalkboard. Then [the teachers from this village] were supposed to return to [the village] and teach all of us. But [the teachers] never got any experience in actually practicing the use of participatory methods. It is all up to us teachers how we choose to teach.

After club activities started, however, many club teachers said they had been able to start using participatory methods in their classrooms. These methods included (a) designing sitting arrangements where students sit in a circle, (b) use of small groups, (c) presentation of findings by a spokesperson for each small group, and (d) having students carry out work themselves in classroom activities. For example, the beginning female health club teacher reflected that:

Because of the club activities I have started to use small groups in teaching math to year V. I wrote an example of how to do a problem on the board and had the

students work in small groups to solve it. I then picked small groups who had the correct answer to come up to the board and teach the students in the classroom.

And the veteran male agricultural teacher had a similar reaction:

Teachers here like me are accustomed to teaching theory only. I have learned in the club how to use the participatory method and that it is better if students see with their own eyes than just learn theory. I learned that students themselves must answer questions and not the teachers. They understand better when they explain their answers. In my own year I classroom in the subject of “Studies of Work” recently I had students work in small groups to draw and label trees. I then asked the students in each group open-ended questions about the vocabulary they labeled in their pictures.

A starting female environment club teacher described how, despite her classroom being overcrowded, she was able to implement participatory methods of instruction:

In my own classroom – I teach year VI where there are 83 students – I now have the students work in groups to answer some questions.

These examples illustrate how pedagogical practices of teachers can be influenced positively when consistent support in executing participatory instruction is provided.

Thus, Roberts & Schwille’s (2012) findings shed light on how applying a participatory methodology with ongoing modeling and support for teachers can change teacher behavior. However, many of the club teachers described that, although they were now implementing participatory methods in their own classrooms, they were still faced with many challenges such as limited textbooks and large classroom sizes. Overall, they

agreed that they still needed additional training in using a participatory methodology effectively through continued follow-up.

Conclusion

In this dissertation, I have used school gardening and farming as a window to look at the nature of primary schooling in two Tanzanian communities. Although initial data collection indicated that their school gardens and farms were relatively well taken care of, it turned out that school gardening was given a lot of emphasis, but without substantial improvement in student opportunities to learn. In fact, school gardens contributed, in my view, to diminished learning opportunities.

What would school cultivation be like, in my view, if it were to offer the opportunities to learn that are desired? Based on the skills called for by the 2005 national curriculum reform in Tanzania, in student and teacher time spent on school farm and garden activities I would expect students to be engaged in applying skills from the curriculum, especially in science and math. For example, in order to learn the plant life cycle, they could conduct small experiments where different plants of the same variety would be given different controlled amounts of water, sunlight, fertilizer, and even spacing. The students would gather data by recording information such as through measuring plant/leaf heights and widths, write journal entries where they reflected about their observations daily, and then compile their results and present their findings to their class and/or community. Students would also experiment with growing different crop varieties in order to determine which plants grow best in the climate and soils of their community. The presentations they would give about their findings could be based on a few factors such as the sheer yields of the crop, the taste, quality, value on the market, or

the ability to sell. Local farmers could be invited to serve as advisors in the process, and students or the advisors could even disseminate the findings to the community.

In these endeavors, students would be engaged significantly more in hands-on instruction called upon by the TMEVT's 2005 reform. Not only this, but students would gain an understanding of how to address food security in their community through controlled experiments in which they critically examine the type of plant care and plant varieties that are most suitable for their local climate. In so doing, students would be exploring and addressing issues in their community that are relevant to their daily lives and can be directly applied to their context.

In considering ways by which to enact change in teaching practices in Tanzanian primary schools in order for teachers to (a) maintain teaching practices where their students are engaged in academic instruction during school hours and (b) comply with the 2005 primary school education national curriculum reform's call for teachers to use participatory methods in their classrooms, I refer to three projects that offer insights into different ways to engage student, change teaching practice and provide organizational support.

Roberts and Schwille (2012) show how Tanzanian students in the village in southern Tanzanian village examined respond favorably to being actively engaged in participatory learning. Students specifically stated that their learning gains were substantial when they were empowered to take action in problem solving, inquiry, and experiential learning activities in lieu of the teaching practices at schools where teachers only teach one to three subjects out of the eight subjects in the prescribed curriculum.

McDonough and Wheeler (1998) also find that by having students actively involved in the learning process, presenting their findings, and working with adult villagers to take action, they learn about community problems and possible solutions. Their study details feasible ways for providing ongoing technical support to teachers and introducing activities where teachers are more actively engaged in the learning process. They found that these changes in teacher practice were the result of consistent technical support provided throughout the implementation phase of the project and ongoing staff development opportunities and follow-up support.

While McDonough and Wheeler find that a major obstacle for their project was securing the active involvement of the ministry of education in training teachers on an ongoing basis, Schwille, Dembele, & Diallo (2001), in their analysis of a World Bank project in Guinea to get primary school teachers to take more responsibility for their own professional development, show that one key element in facilitating such a major change is involvement of government officials at all levels—as well as teachers—throughout the process in the project design and its implementation, but especially in planning how to scale up the project on a national level. From the beginning, the project adhered to a participatory process where effort from participants was required from the start, from both classroom teachers and higher level ministry personnel. For example, the project involved people already in positions of power in the various ministry offices (central, regional, prefectural, subprefectural) so that the program became one of the regular activities at their offices. Another major factor was that in designing a guide to be used by teachers, the project staff consulted with teachers and revised it based on their feedback. This project was noteworthy not only because of the autonomy given to

teachers in decision-making, but because the project was scaled up to all regions in Guinea from 1995 to 2000 so that by the end of five years over half of the primary school teachers in Guinea had participated in it. And to provide the continual, but non-directive advice and support needed in such a program, some 300 mid-level ministry officials worked with teams of teachers as facilitators and internal evaluators.

Since the TMEVT also calls upon teachers to engage their students in activities in the classrooms where students gain understanding, problem solving skills, and critical thinking, further inquiry on the quality of education in rural Tanzanian primary schools should therefore examine these issues in greater detail at all levels of the educational system in order to identify how changes in teaching practices can be brought about on a wider scale in Tanzanian state public primary schools and what this would mean for opportunities to learn, in terms of both engagement and quality. While adult villagers reported a lack of accountability of teachers in Tanzanian state primary schools, a minority of parents stated, in interviews, that their children's teachers should follow their teaching schedule and engaging students in learning in strict adherence to their assigned teaching duties. These factors suggest that the expectations that villagers for teacher accountability are changing and that these may be potential areas of change in this nation's future. Further inquiry should continue to monitor and do research on such possibilities in order to improve student learning opportunities throughout primary schools, and especially to fulfill the promise of school cultivation in all respects

APPENDIX

APPENDIX B

A Review of the Research Questions:

What Changed During The Course of My Research and What Were The Answers Found?

Answers to the research questions presented in Chapter 2 are given in the section below. Cases where the gathering of these data was no longer relevant or insufficient are indicated below.

Question 1: How do teachers, school leaders, and donors understand the value, purpose, and implementation of teaching and learning in school cultivation programs and regular classroom activities and what kind of knowledge and support do teachers have for these initiatives?

In this dissertation I found that there are different expectations that stakeholders have for teaching and learning at each school which often act in opposition to one another. For example, the primary expectation, which is for all schools to prepare students sufficiently in order to pass national exams, was often opposed by the subsidiary expectations that schools should generate income and cultivate work ethic amongst students. This was because students at both schools were often ordered to participate in work activities during time designated for school subject study in the school day. These subsidiary expectations were also often promoted by teachers in lieu of academic instruction as a likely consequence of the two donors' emphasis on their own objectives, which were to promote agricultural innovation and sustainable environmental practices in their targeted communities. While donor technical support generally focused on pushing forward each of these objectives through the training of teachers and villagers in agricultural skills and knowledge, problematic teacher practices in classroom and in school farm/gardens were left unaddressed.

Therefore, in order to make progress in attaining these subsidiary expectations that were also favored by the donors, teachers continued to rely on traditional methods of

instruction in their classrooms and in order giving in the gardens. Despite the emphasis of the 2005 primary national curriculum reform's call for students to be actively involved in the learning process through problem solving activities and teacher facilitation of hands-on activities, student learning of academic subjects was very limited in both time and learning approach at both schools. Time was disproportionately allocated to farm activities in lieu of academic instruction, but also students in classroom and farm were treated as passive recipients of knowledge to be memorized.

Question 2: What are the values and beliefs of students, their families, and their communities regarding the educational services provided based on the outcomes and experiences they have or do not have?

The predominant view of students, families and their communities revealed that these schools were believed to be successful because students passed national exams. They were satisfied with the teachers at their school because teachers not only met this objective but were also facilitating other activities effectively such as the school farm and extra classroom instruction on the weekends to prepare students for national exams. However, a minority of participants voiced concerns about teacher habits at their school such as the rote instructional methods used, inability to adhere to their teaching schedules, and their use of student labor in the cooking of school lunch in lieu of having their students be engaged in classroom instruction. They voiced dissatisfaction with these teacher habits and desired change so that their children would be provided with a higher quality of education.

Question 3: What other social, cultural and economic resources do families access and activate in pursuit of agendas for schooling at the family and community level and through participation in schooling?

The social and cultural resources that families access in the pursuit of their agendas of schooling were not examined in this study. The reason was because the data collected on this aspect was insufficient because the focus of this dissertation shifted to learning about schooling practices and the views of students, teachers, villagers, and donors. However, I did gather data about the economic resources that families use. What I learned was that families must contribute significantly to their children's education through the imposition of school fees in Tanzania and also because of the requirement that they must contribute corn and beans for the school lunch as well as firewood for the cooking of school meals. In the case of FPS, families were unable to comply in contributing their required portion of corn and beans due to drought conditions faced in the 2011 rainy season. This simply meant that students were no longer able to eat school lunch each day.

It was also learned that the main objective families have for their children through schooling is economic; their aim is for students to be prepared sufficiently in order to attain a position of employment where income can be generated in their futures. Parents also now see schooling as an alternative means by which to prepare students for generating income in the future in lieu of the traditional occupation in their villages, which was farming. Nevertheless, they also view agriculture as being too difficult due to the challenges in making a profit such as harsh weather, fluctuating market conditions, and poorer health conditions due to the strenuous labor involved and the worsened effects

to their bodies through applying store-bought pesticides in their fields and those of other farmers.

Question 4: What are school gardens actually used for?

The main objectives of both donors were increasing agricultural knowledge and diffusing environmentally sustainable practices to the community through the school garden and farm programs in both school sites. However, I learned that teachers in both sites continued to use the school gardens and farms to meet the traditional objectives of school farms in sub-Saharan Africa: production. They did this in order to generate school income (only NPS) but also to supplement the school lunch (both schools). Teachers relied on traditional methods of instruction in garden learning and, despite being provided with training in the use of innovative agricultural methods provided by both donors, they generally fell back on using the traditional agricultural methods of their community while only occasionally teaching students how to use and apply alternative agricultural techniques or how to grow different plant varieties.

Summary of the Above Findings

The findings above show that a minority of parents desire improvements in the quality of teaching and learning at their children's schools. The findings from this study also reveal that their dissatisfaction about teacher habits at each school is a likely consequence of teacher time frequently being concentrated on activities that are not in compliance with their designated classroom instructional responsibilities. The preceding section of this chapter on OTL reveals that these findings come as no surprise. In fact, this situation mirrors the challenges faced in low-income countries across the globe. The purpose of this section on OTL above is to offer insights into how more can be learned

about the nature of teaching and learning quality in Tanzania in order to improve the educational services provided to students.

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