

PLANET AID/ADPP Mozambique/USDA Food for Education Programme

Baseline study report

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30 September 2013

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Acknowledgements

This baseline study has been realised thanks to the hard work and cooperation of a large number of individuals and organisations. The authors would like to thank all those who contributed to it. In particular, their thanks are extended to all those who took part in interviews or focus groups for the useful information they shared: many thanks to all the pupils, parents, community members, teachers and volunteers who contributed in this way. Sincere thanks are also due to the representatives of the Government of Mozambique at central, provincial and district level, who facilitated the process and gave of their time and expertise to provide important information; to the school heads, deputy heads and teachers who received the study team and spent time conducting school visits and sharing information with them; to the Food for Education Programme managers and staff, who gave invaluable help in organising the logistical aspects of the study; and to the programme officers who went around rural schools in difficult conditions when they had many competing demands on their time, collecting the information needed. Finally, the authors would like to thank the representatives of USDA, PAI and the ADPP management team for their support and assistance in preparing the report.

List of abbreviations and acronyms

ADPP	<i>Ajuda de Desenvolvimento de Povo para Povo</i> Development Aid from People to People
CSB	Corn Soya Blend
DIPE	<i>Direção de Programas Especiais</i> Directorate of Special Programmes (MINED)
DPEC	<i>Direção Provincial de Educação e Cultura</i> Provincial Directorate of Education and Culture
EPF	<i>Escolas de Professores do Futuro</i> (teacher training college run by ADPP)
FAO	Food and Agriculture Organisation
HIV&AIDS	Human immunodeficiency virus infection/acquired immunodeficiency syndrome
IR	Intermediate Result
JAM	Joint Aid Management Programme
M&E	Monitoring and Evaluation
MGD	McGovern Dole
MINED	Ministry of Education
MUAC	middle upper arm circumference
PAI	PLANET AID Inc.
PAMRDC	<i>Plano de ação multissetorial para a redução da desnutrição crónica em Moçambique</i> 2011-2014 (2020) Multisectoral Action Plan for the Reduction of Chronic Undernutrition in Mozambique
PARP	<i>Plano de Ação para Redução da Pobreza</i> Poverty Reduction Action Plan 2011-2014
PEE	<i>Plano Estratégico da Educação</i> Second Strategic Plan for the Education Sector 2012-2016
PRONAE	<i>Programa Nacional de Alimentação Escolar</i> National School Feeding Programme
SDEJT	<i>Serviço Distrital de Educação, Juventude e Tecnologia</i> District Office for Education, Youth and Technology
SDSMAS	<i>Serviço Distrital de Saúde Mulher e Acção Social</i> District Service of Health and Social Affairs
USDA	United States Department of Agriculture
WFP	World Food Programme
WHO	World Health Organisation
WISHH	World Initiative for Soy in Human Health

Executive summary

The Food for Education programme, funded by the United States Department of Agriculture (USDA) and implemented in Mozambique by PLANET AID Inc (PAI) and ADPP Mozambique in partnership with the Ministry of Education (MINED), is a comprehensive school-feeding programme, complemented by a major teachertraining program component and health and nutrition interventions. The programme's goals are to improve literacy of school-age children in Mozambique and to increase the use of health and dietary practices. Due to ADPP's experience of education, health and community development in Mozambique, the organisation is well qualified to implement the Food for Education programme.

This baseline study has the following objectives:

- a) provide a 'photograph' of the initial situation before the programme activities, giving information against which to measure the subsequent achievements;
- b) identify factors which need to be taken into account in implementing the programme (e.g. other interventions already taking place, resistance to certain approaches etc.) ;
- c) promote ownership of and awareness of the programme.

A brief review of selected literature relating to school feeding and relevant to the baseline study provides the necessary context against which the findings can be understood. It briefly summarises evidence of the benefits of school feeding, presents data on food security, malnutrition and stunting, anaemia and iodine deficiency and resumes the history of school feeding in Mozambique.

The presentation of the methodology used for the study explains the different data sets collected and used. These include quantitative and qualitative data from a wide range of informants: pupils, parents, teachers, schools head teachers, representatives of government at district, provincial and national level, programme volunteers, community members, nutritionists and other stakeholders involved in school feeding programmes.

The study's findings are grouped into findings regarding pupils, those regarding teachers and those related to schools. The information collected is presented and discussed in textual form, with reference to three tables of findings presented as annexes. They reveal a picture of pupils who struggle to read despite having satisfactory term test scores and have limited access to all but the most basic of school materials; weights and heights significantly below international standards for their age imply widespread chronic malnutrition and the majority of pupils claim to experience short-term hunger at some time whilst at school. Pupils eat on average slightly more than twice a day but frequently do not eat the food their bodies need or eat at the right time, and often come to school with an empty stomach. Pupils have problems concentrating in class, although they report these to a lesser extent than do their teachers. The majority of pupils have a basic understanding of the principles of basic hygiene practices, but they appear to apply these less frequently, possibly in part due to the absence of water available for hand washing in schools. Most pupils have taken de-worming treatment at some time.

Teacher findings show high self-reported levels of current skills, knowledge and use of teaching materials, which contrast sharply with the quality of teaching observed, which was teacher centred and non participative and often exacerbated by the poor material conditions in many schools. Teachers declare themselves open to discovering and using new teaching methods and would welcome opportunities for ongoing training. They report insufficient access to teaching materials, with the material

mentioned as most needed varying between teachers and schools. In particular they cited insufficient textbooks in their schools as a barrier to effective teaching and learning.

The school level findings reveal considerable variation between schools in terms of size, teacher and class numbers and the construction of the school, with differences observed between the four intervention districts. Despite primary enrolment rates of over 90%, these diminish over the first four years of primary school. The district of Moamba has a dropout rate of 30% for boys, probably due to its proximity with the South African border. Schools report attendance rates of between 76% and 86%, although these may be inflated. The infrastructure necessary to provide school feeding is not yet available in most schools, although 30% of schools (and 75% of the schools in Manhica) possess some type of kitchen. Most schools have access to water of some kind, although the quality of this is unclear; 44 schools have no access to water. 20% of the intervention schools have no latrines. Where latrines exist, these vary in quality and quantity: almost 50% are pit latrines surrounded by a grass wall. Almost half the schools surveyed have an existing garden, a key to the sustainability of the school feeding, and most of the others have access to suitable land. Finally almost all the intervention schools claim to have an active school council, felt to be an important requirement for the success of the programme.

The final set of findings concerns a series of factors revealed by the study which need to be taken into account in implementing the programme. These include other school feeding interventions currently taking place in Mozambique: the pilot of the national school feeding pilot in 12 schools in Tete province, and a WFP-supported nutrition programme delivered through health centres. Lessons from previous school feeding interventions are presented. These include the need for clarity regarding the expectation of incentives by programme volunteers. Warnings about the challenge of scaling out ADPP's approach and methods to an intervention of this size include the question of the profile and preparation of the programme officers and the need for an integrated information and data management system. Finally the importance is stressed of food provided to pupils being fortified in line with their nutritional needs.

The findings are summarised in terms of measures for each of the programme output indicators, which are presented in table form. Finally a series of action points which emerged from the findings is listed.

Despite a number of challenges, there is a general enthusiasm for the programme and a belief that it will help to improve school attendance and outcomes. If ADPP can capitalise on this generally positive attitude and on the many positive points revealed by this baseline study and address the areas of concern identified, the programme should achieve its objectives.

Introduction

The Food for Education programme, funded by the United States Department of Agriculture (USDA) and implemented in Mozambique by Planet Aid (PAI) and ADPP Mozambique (Planet Aid's local partner in Mozambique), in partnership with the Ministry of Education (MINED), is a comprehensive school-feeding programme, complemented by a major teacher training program component. The programme's goals are to improve literacy of school-age children in Mozambique and to increase the use of health and dietary practices. ADPP, which is a member of the Federation of Humana People to People network, has many qualifications to implement the Food for Education programme, its first experience of school feeding. It has over twenty years experience of education and community development in Mozambique, deep community implantation and a tradition of integrated interventions, which include and promote the connections between health, education, livelihoods and other dimensions of community development, working in partnership alongside the communities it supports.

Taking a holistic, multi-faceted approach to promote the health, wellbeing and education of school-aged children, the programme combines schoolfeeding with health, water and sanitation, and nutrition education components. To promote the sustainability of this intervention, in parallel with those activities, a teacher-training program benefiting 4,000 primary schoolteachers is implemented in eleven teacher training colleges (*Escolas de Professores do Futuro*: EPFs) run by ADPP in Mozambique in partnership with the Ministry of Education (MINED). The programme is based on community support for school-feeding and related activities and includes the formation and organization of School-Feeding Committees. Improved health and nutrition of the pupils in target schools is addressed through the development of school gardens, the provision of a safe and adequate school water supply, and the implementation of a de-worming campaign. The production of nutrition and health educational materials and information and the implementation of a nutrition campaign, in partnership with the World Initiative for Soy in Human Health (WISHH) is designed to reach 1,000,000 direct and indirect beneficiaries. It is hoped that the programme will serve as a model for the National School Feeding Program currently being piloted by the Government of Mozambique in collaboration with the Government of Brazil, the World Food Programme (WFP) and Food and Agriculture Organisation (FAO).

The target beneficiaries of the Food for Education Programme in Mozambique are:

- 60,000 primary schoolchildren in 242 schools in 4 districts of Maputo Province who will receive a daily meal;
- 4,000 future teachers who will receive teacher training at eleven training colleges;
- 1,000,000 people who will receive health and nutrition education and information.

As set out in the programme's Evaluation Plan, this baseline study, which was carried out before the onset of the programme interventions, by the programme team under the supervision of the M&E manager and with support from an external consultant, has the following objectives:

- d) provide a 'photograph' of the initial situation before the programme activities, giving information against which to measure the subsequent achievements;
- e) identify factors which need to be taken into account in implementing the programme (e.g. other interventions already taking place, community resistance to certain approaches etc.);
- f) promote ownership of and awareness of the programme.

On the basis of the baseline information presented in this report, targets will be established for programme monitoring and evaluation indicators at key milestones. These milestone targets will both allow the effective ongoing monitoring of progress and contribute to the framework for the mid-term and final evaluations.

The present report begins with a brief review of selected literature relating to school feeding, to provide the necessary context against which the findings of the baseline study can be understood. A section presenting the methodology used for the study follows; this is structured around the different data sets collected and used, which are presented at the same time. The study's findings are presented next: after a discussion of the comparability of the control group and intervention group samples, findings regarding pupils are presented and discussed, followed by findings regarding teachers and findings related to schools. The final set of findings concerns factors revealed by the baseline study which need to be taken into account in implementing the programme. This is followed by a summary and conclusions.

A number of sections are followed by suggested action points, introduced by an arrow (→).

Brief literature review

This review of selected literature does not seek to assess the extensive available literature on school feeding but to present information most relevant to the present baseline study and which provides context against which the primary data collected can be analysed. School feeding programmes have been widely used to improve health and educational outcomes of school-aged children¹. They have been used to address different problems, including relieving short term hunger, improving micronutrient status, growth, cognition, and academic performance and, in developing countries, to increase school attendance and enrolment (Kristjansson et al., 2009). Evidence from previous school feeding evaluations shows that school feeding has led to improved education, nutrition, and health outcomes for children, although school feeding is most successful at enhancing learning where other improvements in school quality are made simultaneously (World Bank, cited in Kristjansson et al., 2009). In addition to alleviating hunger and malnutrition, school feeding can also enhance food security within the child's household. Where children benefit from school meals, families are less likely to withdraw children from school during times of hardship. The evidence of positive impacts of school feeding on education includes higher enrolment and attendance levels and lower drop-out rates, associated with enhanced educational and lifetime livelihood opportunities. In certain contexts, school feeding has addressed education gender gaps by targeting girls. One concern is that the home diet may be reduced for children who are receiving food at school, since any extra food is used to benefit other household members (Galloway, 2006, cited in Kristjansson et al., 2009). A further concern is that in addressing a symptom of hunger, school feeding programmes fail to address its root cause; they may also cause stigma (McIntyre 1992, cited in Kristjansson et al., 2009).

National data on food security, malnutrition and stunting

The 2010 Multisectoral Action Plan for the Reduction of Chronic Under-nutrition in Mozambique estimates that 35% of the population of Mozambique are in a situation of chronic food insecurity and therefore vulnerable to natural shocks. Although food insecurity nationally has diminished in recent years and this is likely to continue, the diet of majority of the population is

¹ The rest of this paragraph is taken from the Evaluation Plan prepared by the consultant Simone Doctors for the Food for Education Project

low in diversity and poor in fats, proteins and micronutrients , although it provides sufficient calories for daily activities (PAMRDC, 2010 21-23).

The 2011 Mozambique Demographic and Health Survey uses weight and health measures to evaluate nutritional status, producing indicators of the nutritional state of the population based on height for age (H/A), weight for height (W/H), and weight for age (W/A). These are expressed as average deviation from the standard population (according to the WHO 2006 standard) using standard deviation (Z scores). Whereas H/A is an indicator of chronic malnutrition (which results in reduced growth and therefore stunting), W/H reveals acute malnutrition (which results in a child being too thin for their height: “wasting”) and W/A combines the other two indicators and indicates general malnutrition (both deficit in height/”stunting” and deficit in weight/”wasting”) (153).

The Survey found that 43% of Mozambican children under 5 suffer from moderate chronic malnutrition, having stunting or low height for their age (H/A); 20% suffer from serious chronic malnutrition, with a standard deviation of 3 below the WHO standard; and 8% from acute malnutrition, with low weight for height W/H, one in four of these cases being critical. The rate of infant malnutrition correlated negatively with the educational level of the mother and positively with poverty: in the lowest wealth quintile, infant malnutrition is more than double that in the highest (153). The mean rate of moderate chronic malnutrition or stunting in Maputo province is 23%: significantly lower than the national average, but nevertheless a cause for great concern. Likewise, the rate of acute malnutrition in Maputo Province is lower than the national average, standing at 2% (154).

Anaemia and iodine deficiency

The 2011 Mozambique Demographic and Health Survey found that 69% of children under five suffer from some form of anaemia, with 26% having ‘light anaemia’, 39% ‘moderate anaemia’ and 4% acute anaemia. Although Maputo Province has one of the lowest rates of childhood anaemia in the country, this nevertheless stands at 52%. The existence of childhood anaemia is clearly related to socioeconomic status. The percentage of children with anaemia diminishes with the educational level of the mother and with wealth measure (167). Anaemia may be caused by iron deficiency but this is often associated with malaria, blood loss due to parasitic infections and deficiency in other micro nutrients such as folic acid and vitamin A. Consequences of anaemia include decreased work capacity, fatigue, prematurity and low birth weight, perinatal mortality, maternal mortality, child mortality and impaired neuro-cognitive function in children (Christian, 2005) .

Iodine deficiency is also endemic in Mozambique: an estimated 30% of women of reproductive age and 68% of the school-age population suffer from iodine deficiency (PAMRDC, 2010:19). Iodine deficiency has been shown to lead to hypothyroidism, whose symptoms include extreme fatigue, goitre, mental retardation, depression and weight gain (Felig & Frohman, 2001).

Because of these high levels of anaemia and iodine deficiency, both of which can lead to educational problems, amongst other consequences, it is important that school feeding programmes should provide iron, vitamin A and iodine, as well as being accompanied by de-worming. It is also crucial that such programmes include a nutrition education component, so that children learn how to eat healthily and to take responsibility for their own nutrition and wellbeing. Girls approaching adolescence in particular should receive iron supplements and de-worming treatments as well as nutrition education so that they can learn to look after their own nutritional status.

History of school feeding in Mozambique

The WFP began boarding school feeding in 1977, two years after independence and at the beginning of the war of destabilisation which lasted until 1992, providing three complete meals per day to 28 000 beneficiaries in 191 boarding schools nationwide. In 2002 the WFP and Joint Aid Management Programme (JAM) began primary school feeding in 172 schools nationwide, benefiting 200,000 beneficiaries. In 2003, in response to the crisis caused by HIV&AIDS, the WFP began to distribute “take-home rations,” consisting of 50kg bags of cereals and pulses, distributed twice yearly to 10 000 girls and 27 000 orphans and vulnerable children, as an incentive for them to go to school. At this time, the WFP was providing school feeding to more than 250 000 children, approximately 6% of the 4 million children then in primary school. The programme used imported foods and evaluations underlined the high implementation costs. It was decided to gradually phase out the WFP programme, transferring responsibility for school feeding to the Government of Mozambique. The gradual takeover of the programme by the Government between 2007 and 2011 and the creation of a national School Feeding programme for Mozambique was supported by technical assistance from Brazil and the WFP, within a tripartite agreement in 2010. At the same time, JAM aligned its school feeding programme with the government plans.

In 2011, the Government included school feeding in its Second Strategic Plan for the Education Sector 2012-2016 (*Plano Estratégico da Educação: PEE*) and its Poverty Reduction Action Plan 2011-2014 (*Plano de Ação para Redução da Pobreza: PARP*). The same year, the Government, developed a new school feeding programme, with input from the WFP and the FAO, based on local purchasing, school production, lower costs and more community involvement. From 2012, the new programme is being piloted with financial and technical support for the WFP and the Government of Brazil, with the objective of implementing a sustainable school feeding programme from 2016 (Rego, 2012).

In addition to piloting the new model of school feeding in 12 schools, within the tripartite programme a strategy for sustainable school feeding was developed. This led to the National School Feeding Plan (*Programa Nacional de Alimentação Escolar: PRONAE*) which was approved on 14 May 2013 by the Council of Ministers of Mozambique.

The new UNDA/PAI/ADPP Food for Education Programme is one element in the PRONAE which, it is hoped, will be able to serve as a model for future interventions within the national plan.

Rates of literacy and secondary education amongst adults in Maputo Province

In order to provide some context for the enrolment rates of children in school, it is useful to know the educational profile of their parents. The percentage of women in Maputo Province with secondary education or higher rose from 15% in 2003 to 40% in 2011; for men the figures rose from 33% in 2003 to 49% in 2011. The percentage of literate women in Maputo Province rose from 70% in 2003 to 77% in 2011; for men the figures fell from 92% in 2003 to 85% in 2011 (Mozambique Demographic and Health Survey, 2011:46, 49).

Primary enrolment rates

Thanks to concerted efforts to achieve the Millennium Goals for Education and the Education for All objectives, primary enrolment rates in Mozambique have increased sharply over the past decade. According to the 2011 Mozambique Demographic and Health Survey, net primary school enrolment rates in Maputo Province in 2011 stood at 90.6% overall (91.1% male; 90.2% female; parity index 0.99), with gross primary enrolment at 143.5% overall (144.2% male; 142.8% female; parity index 0.99) (39).

However enrolment figures do not address the question of retention and disguise the fact that at least one in three children in Mozambique does not reach grade 4 and fails to achieve basic literacy (GMR, 2012). The 2012 GMR gives net intake rates for primary education as 66%, with a gender parity index of .99 and gross intake rates for primary education in Mozambique of 161 (165 male; 157 female) (346-7). The intake rates, which cover the whole of the primary cycle, in turn disguise the low level of achievement of many primary school pupils: the GMR claims that only 16% of Mozambican schoolchildren are able to learn 'the basics' (2012: 126).

Hand washing facilities in homes

In order to provide some context for the investigation of pupils' hygiene knowledge and practice, information about hand washing facilities in their homes is instructive. The 2011 Mozambique Demographic and Health Survey found that in the place where members of the household usually washed their hands, only 26% of these contained water and soap, and 44% did not contain water, soap or any other means of washing hands (local materials, such as ash, mud or sand). In comparison with the national figures, those for Maputo province were higher: water and soap were found in 74.9% of hand washing places; only 4.8% did not contain any means of washing hands (27-28)

Methodology

An initial baseline survey of 205 schools was conducted in early 2013 by ADPP's Food For Education team, under the supervision of their M&E officer. In April 2013, the external consultant was contracted to support PAI and ADPP to complete the programme Evaluation Plan and Programme Monitoring Plan and to extend and complete the baseline study. During a two week mission to Mozambique in May 2013, the consultant worked with the programme team to:

- plan the baseline study and develop the data collection tools;
- plan and deliver a training workshop for all programme officers on the principles of project M&E;
- train a team of programme officers to collect individual information during interviews with sample pupils and deliver questionnaires to sample teachers ;
- visit of the four intervention districts to conduct interviews and focus groups, school visits and observation of teaching
- conduct interviews with key stakeholders based in Maputo.

The pupil level data were collected during June by the programme officers based in the intervention districts and were then collated and entered into Excel workbooks by the M&E team in July. The questionnaire data from teachers was collated and entered into Excel workbooks by the M&E team. These data, plus the transcriptions of interviews and focus groups and the data on term tests from the DPEC were centralised and collated by the M&E manager before being transmitted to the consultant for analysis. Following the analysis of the different data sets, the consultant wrote up a presentation of preliminary results (early September), before writing up the present Baseline report. Throughout the period of data analysis and report writing, the consultant was in daily email contact with the programme team, who provided invaluable clarifications and responses to queries, in addition to restructuring information upon request. During this period, the M&E team also updated the original school survey to include information from schools which had been subsequently included as programme beneficiary schools, taking the total to 242. The process was thus one of extremely cooperative and flexible teamwork at distance.

Data sets analysed

In addition to the analysis of selected secondary data to compile the brief literature review (above), the Baseline findings presented below are based on analysis of a number of primary data sets. Rather than treating these individually, the Findings are presented thematically, and based on all the data available. The following data sets were compiled and used:

1. Survey of 205 intervention schools early 2013 (prior to the involvement of the consultant) using a questionnaire, updated 15 September 2013 to include 242 schools

The questionnaire was distributed to each intervention school by the programme officers, who subsequently collected it and transmitted it to the M&E team, via the district programme offices. In most cases the questionnaire was completed by the school head or by the school council. Due to some questionnaires being only partially completed and to some respondents failing to complete the questionnaire as hoped, in these cases the programme officers returned to the school to provide guidance. When new schools were included in the programme, they were asked to complete the same questionnaire. The questionnaire covered information relating to the size and profile of the school; the infrastructure of the school, in particular those aspects needed to provide school feeding in safe and effective conditions; information about pupils attendance and dropout rates; the school council; de-worming campaigns and access to external support. A summary of the information obtained is presented in the table in annex 3 and the findings are presented and discussed throughout the different sections of the chapter on Findings below.

2. Interview data collected from a sample of 529 intervention group pupils and 509 control group pupils, including literacy testing, weighing and measuring.

The size, composition and distribution of the pupil sample and of the control sample, were calculated on the basis of advice from a statistician.² Due to the requirements of the programme, which intervenes in virtually all the schools in 4 districts of Maputo Province (Manhica, Moamba, Matatuine and Magude), subjects were not allocated randomly to the intervention or control groups. The intervention group comprised 16 pupils per school (rather than 15, so as to easily achieve balance of gender and grade, by using 4 x grade 3 girls, 4 x grade 3 boys, 4 x grade 5 girls, 4 x grade 5 boys), from each of 32 schools (8 in each district)³. Alphabetical sampling was used, so the first 4 girls and the first 4 boys on the register were chosen from each target class. The control group consisted of 16 pupils, also balanced in terms of grade and gender, selected in the same manner from each of 32 schools in the district of Namaacha, a neighbouring district in the same province as the intervention schools and considered by the Provincial education authorities to be 'comparable'⁴.

Pupils were interviewed individually by programme officers: during the interview, the pupils performed a reading test, answered questions relating to their knowledge and understanding of basic hygiene and their access to school materials and were weighed and measured. It was decided not to use middle upper arm circumference (MUAC), another anthropometric indicator of

² The calculation was based on a sample reading test, with a mean of 35, standard deviation of 12, where an increase in 5% of the mean test score translates into an effect size of 0.15; it revealed a pupil cluster of 15 per school was needed, with 32 schools in each group i.e. 480 pupils in each group, to achieve 80% power.

³ This should have resulted in samples of 512 pupils from each group. The slight discrepancy in each case was due to the availability of pupils on the day of the interviews.

⁴ Even if it had been possible to identify 4 comparable non-intervention districts, for logistical reasons, it was not possible to constitute a control group composed of pupils from 4 different districts.

malnutrition, since the risk of measurement error is very high. The programme officers were trained to administer the interviews during a two day workshop on the principles of Project M&E, which had a strong focus on the importance of rigour and consistency in data collection methods and on the ethical dimension of data collection with children. Participants developed and trialled data collection tools in groups, performed simulations of the pupil interview, and were trained in methods for reliable and consistent weighing and measuring of school children, which they practiced.

During the reading test, pupils were asked to read aloud a short passage (84 words long) then to answer some questions about the text. The text used, which was the same for both grades, contained logical connections and related to personal experiences and was of a level of difficulty well within the theoretical level of the Grade 3 curriculum.

A summary of the information obtained is presented in the table in annex 1 and the findings are presented and discussed throughout the different sections of the chapter on Findings below.

3. Term test results provided by the DPEC for 1 654 intervention group pupils and 500 control group pupils

The DPEC of Maputo province made available term test results for Portuguese (literacy) and mathematics for 1654 grade 3 pupils from intervention schools and 500 pupils from schools in Namaacha. The size, composition and distribution of the sample were for the intervention group calculated on the basis of advice from a statistician⁵. Unfortunately it was only possible to obtain data for a control group of 500 pupils. The data, in the form of scores out of 20, were presented in Excel workbooks, with a different spreadsheet for each school. An initial comparison was made of the scores of the two groups (see annex 2), following which the decision was taken to focus on the independently gathered reading scores. For further discussion of this, see section *Pupils' scores for Portuguese and mathematics in term tests organised at Provincial level* below.

4. Questionnaire data collected from 200 teachers within the intervention schools

A questionnaire was completed by 200 teachers working in intervention schools, 50 from each of the intervention districts, balanced for gender, level of training and location. The questionnaire contained both questions relating to the teachers and to their pupils. In addition to personal data regarding their training and administrative level, teacher respondents were asked to assess their own skills, knowledge and use of teaching techniques and to answer questions about their access to teaching materials. The questionnaire also contained a series of questions about the respondents' experience and perception of their pupils, concerning short-term hunger, concentration in class, ability to learn, access to learning materials, and knowledge and practice of basic hygiene. The different sections of the chapter on Findings below draw on the findings of the information provided by teachers.

5. Transcripts of semi-structured interviews and focus groups

Semi-structured interviews were conducted with a number of key stakeholders: the nutrition specialist at UNICEF Mozambique; the Senior Program Assistant on School Feeding and a nutritionist at WFP; the Programme Officer responsible for school production at FAO; the head of the Department of Special Programmes and the Coordinator of School Production and Feeding of

⁵ The calculation, which assumed a correlation of 0.8 between baseline and follow-up scores and rho (for the clustering of difference scores) of 0.1, indicated the need for a sample of 50 pupils from 33 schools in each group (33 intervention and 33 control) i.e. 1650 pupils in each group to achieve 80% power.

the DPEC of Maputo Province; and several representatives of the Directorate of Special Programmes of the central MINED. During field visits to the four intervention districts, over the course of four days from 20-24 May 2013, semi-structured interviews were conducted with the Director of Education (or a representative) of each district, the Director of each of seven schools visited and the director of the District Service of Health and Social Affairs of Matutuine. A total of seventeen individual or group interviews were conducted. In all cases, both the consultant and the M&E manager were present and they decided in advance, on the basis of the planned scope and content, which one would lead the interview.

During the field visits, four focus groups were conducted, with teachers from beneficiary schools; parents and guardians of children from beneficiary schools; volunteers selected to prepare the food once the programme begins; and school council representative and community members. The focus group with teachers was facilitated in Portuguese by the consultant and the M&E manager. The other focus groups were facilitated in XiChangana, the most frequently spoken language in Maputo province, used in much of southern Mozambique and neighbouring countries, by one of the programme officers, a native speaker of XiChangana who also had experience of focus group facilitation and had received additional training.

Once consent had been obtained, all interviews and focus groups were recorded using a high quality digital voice recorder. The recordings were subsequently transcribed by members of the M&E team, following guidelines provided by the consultant, and then sent to the consultant for analysis. Transcription quality and accuracy was verified by the consultant using random checks of the transcriptions against the recordings. The focus groups conducted in XiChangana were transcribed directly into Portuguese by the facilitator. All transcriptions were in Portuguese, except for that of one interview (with the UNICEF representative) which took place in English. The transcriptions were analysed using template analysis, a method for thematically analysing qualitative data which involves developing a coding "template", to summarise and organise themes identified as important in a data set in a meaningful and useful manner. The method has the advantage of allowing the emergence of previously unexpected themes.⁶ The findings are presented and discussed throughout the different sections of the chapter on Findings below.

6. Field notes, photos and videos from school visits and observation of teaching

During the school visits, the M&E team and the consultant made field notes (often written up in the car straight after the visit) and took photos. During one trip they were accompanied by a team of professional photographers, who made a detailed record of the visit and the schools visited, including detailed photos of the school infrastructure. In each school visited, a lesson was observed using an observation framework previously developed by the consultant for use in Mozambique. In some cases, where it was possible to obtain consent, the lesson was also video recorded by one of the M&E team, using a mobile phone.

Findings

Comparability of control group and intervention group samples

Since this Baseline study does not function as a randomised control trial, but uses intervention and control groups imposed by the design and requirements of the programme, samples of pupils from the intervention and control groups were compared, in

⁶ For more information, refer to: http://hhs.hud.ac.uk/w2/research/template_analysis/intro.htm

order to establish their comparability and identify variables which are not balanced between these at baseline (with a view to allowing subsequent evaluations to adjust the estimated intervention effect for non-balanced variables as necessary). Following Consort guidelines,⁷ this information is presented as a table (in Annex 1), summarised by mean (M) and standard deviation (SD). To make the data more legible for the general reader, percentages are also used where appropriate.

Analysis of this information suggests that the variable of age might need to be addressed in future evaluations. The mean age of grade 3 pupils in the intervention group is 9.56 years (SD=1.85), as opposed to 9.08 years (SD=1.49) for the control group ($t=3.2$; $df=510$; $p=.001$). Likewise, the mean age of grade 5 pupils is 11.83 years (SD=1.60) in the intervention group and 11.23 years (SD=1.38) in the control group ($t=4.514$; $df=516$; $p<.000$). As is to be expected, given the age difference, mean weight and height are also significantly higher in the intervention group, although the difference is small (see annex 1). One explanation for the difference in age between the intervention and control groups might be that, as explained above, the groups were constituted on the basis of the design and requirements of the programme. Since the programme intervenes in virtually all the schools in 4 districts of Maputo Province (Manhiça, Moamba, Matatuine and Magude), it was not possible to build a control group of pupils from these districts and the control group pupils were selected from the neighbouring district of Namaacha. Although in the same province as the intervention schools and considered by the Provincial education authorities to be ‘comparable,’ it is possible that policy or practice regarding the age children first attend school, or sociological factors conditioning this, may differ from those in the intervention districts.

Significant differences were also found between the reading results of the intervention and control groups and are discussed below.

→ Future evaluations should control for the difference in mean age between the control and intervention groups, adjusting the estimated intervention effect, or redefine the samples to reduce this variation.

PUPIL INFORMATION

Pupils’ reading ability

In order to provide a source of information with which to triangulate the test scores obtained from the Provincial Directorate for Education (DPEC), presented below, pupils from both grade 3 and grade 5 were assessed independently on their ability to perform a reading test. Of the grade 3 pupils, only 14.8% (24.0% of control group) were able to read the text either fluently without problems or fluently with some hesitation, whereas 19.69 % (19.20% of control group) had difficulties reading the text but managed to complete it, 17.42% (27.60% of control group) had difficulties reading the text and did not manage to complete it and 48.11% (29.20% of control group) could read nothing at all (see chart 1 below). These findings, whilst preoccupying, are slightly better than those from a recent study of pupils in Cabo Delgado Province which, using different measurement criteria, found that “overall, students in Grade 3 are struggling to read. Of the 631 Grade 3 students sampled, 59 percent were unable to read a single word in Portuguese. Approximately 33 percent were only able to read from 1 to 5 words per minute (wpm) and only 6 percent of students in the sample were able to read more than 11 wpm” (Equip2, 2011).

⁷http://www.consort-statement.org/consort-statement/13-19---results/item15_baseline-data/

When asked to read the same text, Grade 5 pupils performed significantly better overall, although it is noteworthy that a significant number of pupils in grade 5 were unable to read a single word in Portuguese: 47.55% (48.62% of control group) were able to read the text either fluently without problems or fluently with some hesitation, 20% (12.25% of control group) had difficulties reading the text but managed to complete it, 13.21% (13.44% of control group), had difficulties reading the text and did not manage to complete it and 19.25% (25.30% of control group) were unable to read the text at all (see chart 2 below). The results of the statistical tests on the intervention and control group findings can be found in the table in Annex 1.

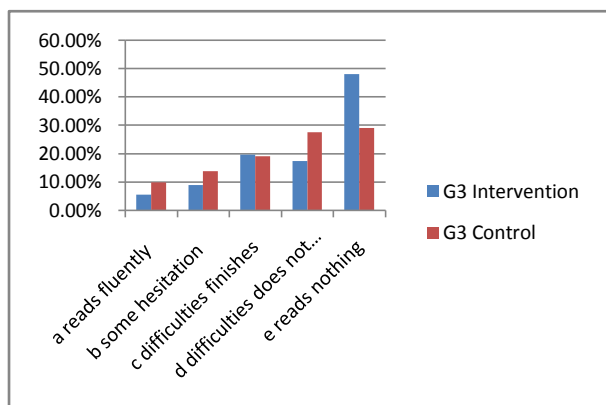


Chart 1: Results of reading test Grade 3

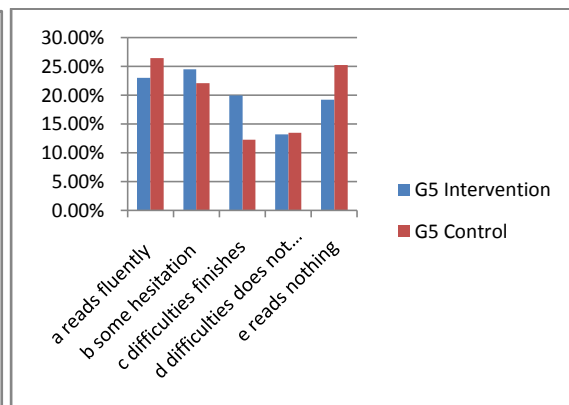


Chart 2: Results of reading test Grade 5

In terms of basic understanding of the text (the theme of which was the importance of hand washing), in answer to the question “what is the text about”, 57.20% of grade 3 pupils (54.4% of control group) mentioned hand washing in their answer, as did 78.49% of grade 5 pupils (68.38% of control group). On the further comprehension questions, designed to probe understanding of what had been read, grade 3 pupils scored a mean of 2.39 out of a total possible 6 points (control group 2.44/6), whereas the mean score for grade 5 pupils was 2.97/6 (control group 2.92/6) (see Annex 1 for the results of the statistical tests on the intervention and control group findings). Overall (grades 3 and 5 combined), a strong positive correlation is found between reading and basic understanding ($r=.636$; $p<.000$), with less strong but significant correlations between reading and further understanding.

Overall, the control groups performed better in reading than the intervention groups, although these differences are more marked in grade 3 than in grade 5 (see Annex 1). These differences observed between the intervention and control groups are particularly noteworthy, since the intervention groups have a significantly higher mean average age than the control groups (see above). The merely quantitative data do not provide any explanation of these differences: these might be due to differences in teaching between schools in the districts covered by the intervention and those in the control district; demographic or sociological differences concerning the pupils (although the other findings do not necessarily provide support for this) or differences in the way the data were collected. Future evaluations can control for these variations at baseline; however, before the evaluation stage, it would be useful to probe further in order to attempt to establish their source. For example, if they can be attributed to differences in the way the data were collected, these methods should be aligned before the evaluation stage.

→ Future evaluations should control for the difference in reading performance at baseline between the control and intervention groups, adjusting the estimated intervention effect as necessary.

Pupils' scores for Portuguese and mathematics in term tests organised at Provincial level

Term test scores were made available by the DPEC for a sample of 1 654 pupils (837 boys; 817 girls) from 50 of the intervention schools and a control group of 500 pupils (250 girls; 250 boys) from 10 schools in Namaacha, a district which will not benefit from the intervention. Although the McGovern Dole (MGD) standard indicator used to measure literacy of school age children is the number achieving a pass score (i.e. 10 or more out of 20) in the term literacy test, since mathematics score were provided in addition to Portuguese (literacy), these were also examined.

Overall, the mathematics scores reveal considerable differences between the intervention and control groups, with 26% intervention group pupils scoring over 15/20, compared with 46% in the control group; 51.27% of pupils scoring between 10 and 15/20 inclusive, compared with 40% in the control group; and 22.73% scoring below 10/20, compared with 14.00% in the control group. The Portuguese scores, when broken down in the same way, reveal less variation between the intervention and control groups: 25.21% intervention group pupils scored over 15/20, compared with 28.40% in the control group; 49.21% of pupils scored between 10 and 15/20 inclusive, compared with 50.40% in the control group; and 25.57% of the intervention group pupils scored less than 10, compared with 21.20 in the control group (see charts 3 and 4 below). For the same information in table form and disaggregated by sex, see annex 2.

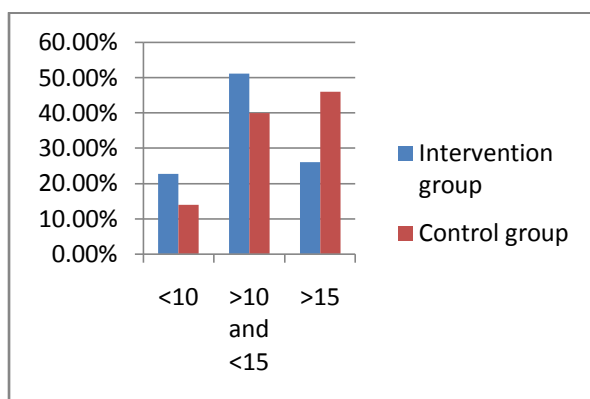


Chart 3: DPEC year 3 scores for Mathematics

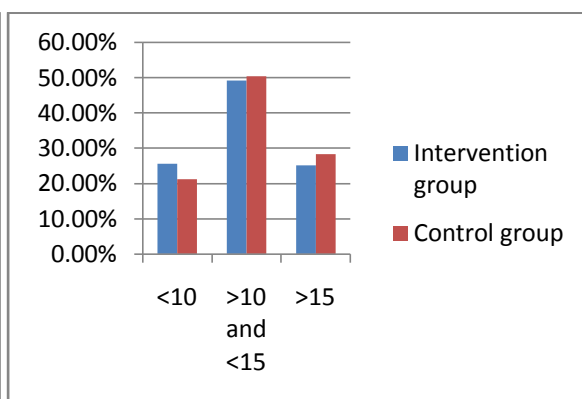


Chart 4: DPEC year 3 scores for Portuguese

Comparisons of these scores with the primary data collected from grade 3 pupils especially for the baseline study reveal some surprising differences in the overall picture they portray⁸. Whereas the data collected by the programme team revealed that only 14.8% of grade 3 pupils (24.0% of the control group) were able to read a short text either fluently without problems or fluently with some hesitation and 48.11% (29.20% of control group) were unable to read the text at all (see above), the DPEC statistics show 74.42% of grade 3 pupils (78.8% in the control group) scoring 10/20 or over in their term Portuguese test, suggesting that the marking system is so generous as to not provide a realistic picture of literacy skills in Portuguese. This discrepancy is a preoccupation since the McGovern Dole (MGD) standard indicator used to measure improved literacy of school age children is the number achieving a pass score (i.e. 10 or more out of 20) in the term literacy test. According to this measure, therefore, at baseline, 74.42% of grade 3 pupils (78.8% in the control group) were achieving a pass score in the term literacy

⁸ The data are presented in different forms: those provided by the DPEC, which relate to term tests taken in class, are presented as scores out of 20; the primary data collected by the programme team and based on an assessment of pupils' reading and comprehension are gradated differently. However this difference in units of measurement used does not explain the difference in findings.

test, whereas the independent reading test reveals much less optimistic results. This discrepancy calls into question the use of official term tests as a measure of literacy.

It was decided to initially prioritise the analysis of the primary data collected specifically for the purposes of the programme baseline study, rather than this 'official data,' for a number of reasons. These include the form in which this data was provided, the discrepancy in numbers between the intervention and control groups, the very large visible differences between the intervention and control group scores and the very large overall discrepancy between the results obtained in the independent testing of reading by grade 3 pupils and these scores.

→ Future evaluations should use independently collected data to assess progress in literacy.

Pupils' access to school materials

90% - 96% of pupils (across grades 3 and 5, control and intervention groups) claimed they took a pen to school with them, 93-97% that they took an exercise book and 73%-78% claimed they took a school bag to school with them (see annex 1 for detailed breakdown). This suggests that students do have access to the most basic school equipment, and was confirmed by the observation within schools and also by teachers' questionnaire responses.

However, only 35% of teachers consider their pupils have access to sufficient school materials, with the lack of pupil textbooks most often cited. When asked if all their pupils have basic textbooks, only 32% replied yes. 93% of teachers declared their schools lacked materials which would help pupils to learn. When asked to give more details, the responses varied greatly, from specific books to coloured crayons and mathematical materials such as compasses and protractors. The observation of lessons confirmed that, while the majority of pupils have a pen and exercise book, the supply of textbooks was insufficient, the few which were visible were shared between several pupils, which disrupted learning.

This suggests that which teaching and learning materials are most necessary is perceived differently from teacher to teacher or from school to school, and therefore that a flexible approach is needed in deciding what materials the programme will provide. In most cases, the most basic materials (pens and exercise books) are not what are most needed.

→ Decisions about the school materials to be provided by the programme should be taken on a school to school basis, in consultation with teachers.

Pupils' access to food and experience of short-term hunger

Overall, 58.24% of pupils claimed to "sometimes" feel hungry whilst at school, whilst 39.83% claimed to feel hungry at the moment of the interview. Whereas there was little difference between the responses of the grades and groups (see annex 1 for the breakdown), when asked whether they had eaten something at home before coming to school, there was more discrepancy between the intervention and control groups: within the intervention group, 54.55% of grade 3 pupils and 53.96% of grade 5 said they had eaten something before coming to school, compared with 70.80% of grade 3 and 58.50% of grade 5 pupils within the control group. It would be interesting to probe this result further to attempt to identify whether, for example, this is due to relative differences in wealth or in dietary culture between the districts in question or whether pupils were interviewed at different times of day (several informants told us that, due to the daily work routine of many households, the first meal of the day is prepared at midday or in the early afternoon, once the parents have come back from their *machambas* [vegetable plots]).

This means that children who attend the first school shift, which begins around 7 am, usually go to school with an empty stomach, whereas children who attend school during the afternoon shift are more likely to have eaten beforehand).

When teachers were asked whether their pupils appear to be hungry during the school day, 74% replied that they did “from time to time” (12% replied “frequently”; 2% “never”). Almost all teachers described the signs of hunger they encountered: these included lack of attention and participation in class, an inability to concentrate, sleeping, yawning or napping in class, lack of interest, wanting to go home early and generally low performance.

When pupils were asked how many times they usually ate daily, the mean response was between 2.35 and 2.59 times (see annex 1 for the breakdown); when asked how many times they had eaten the day before the interview, the mean response was slightly lower, between 2.21 and 2.42 times (two informants said they had not eaten at all the day before).

While these responses should be treated with prudence, since children do not always provide reliable answers to such questions (due either to a conceptual inability to convert their habits into an expression of daily frequency or to unreliability of memory) and/or may deliberately give biased responses, for reasons of prestige or to elicit sympathy, these responses are in line with those provided by other informants. During the focus group with parents, participants said that in general most families eat twice a day.

The information gathered from other stakeholders during the semi-structured interviews confirms the findings above and can be summarised as follows: in Mozambique the problem with school children eating is more one of timing and quality than of quantity: they will usually have something to eat, but it is often not what they need in order to thrive and it is not eaten at the right time to enable them to attend school in the best possible conditions. Meals are often not sufficiently nutritious or balanced, and do not contain the different elements a growing child needs. The available meat or other protein is often given to the father or head of the household, while the children receive little protein. The focus group conducted with parents confirmed this: when asked how food was allocated within the family, at first the respondents replied with the “correct” response, that priority was given to the children. When teasingly challenged by the facilitator, the respondents laughed and said “you know very well that when there is a chicken to eat, the father gets the chicken meat and the children get the feet to chew on.” Chronic food insecurity prevails and there is widespread ignorance about children’s nutritional needs. Family meal times are often organised to fit in with the parents’ work routine and not with children’s school hours, meaning that many children go to school with an empty stomach. This is compounded by the shift system which operates in many schools.

These findings echo the information provided in the literature review on *National data on food security, malnutrition and stunting* above, and have serious implications for the health and education of learners. Taken together, they point to the importance of nutrition education for pupils and their parents, in conjunction with school feeding and to the need to increase awareness of the importance of children eating a balanced diet, containing the different nutrients and micronutrients they need, and eating before going to school or performing other activities.

Pupils’ attentiveness and experience of concentration problems

Most teachers (85%) claim their pupils have problems concentrating in class “sometimes” (while 12% maintain this occurs “frequently”; and only 3% never). Most (82%) also claim pupils “sometimes” have problems learning (15% frequently; 3% never, see annex 1 for the breakdown). When asked their opinion as to why certain pupils experienced difficulty learning, 26% of

teachers' responses contained a reference to hunger or pupils' nutritional status or eating habits. Other responses frequently mentioned social problems, lack of parental engagement, linguistic problems, lack of motivation, the material conditions within the school and general "weakness" (it was not clear whether this weakness may be linked to general health and nutritional status).

When asked about their concentration in class, the pupils' responses were more optimistic: overall, 14.34% reported having problems concentrating in class "often", 40.89% "from time to time", whereas 43.80% claimed not to have concentration problems⁹ (see annex 1 for the breakdown). It is conceivable that teachers may over-report concentration problems or learning problems, preferring to answer "sometimes" rather than "frequently," for fear of appearing to have pupils who are frequently disengaged, which would reflect badly on them as educators. Students may under-report concentration problems, so as to appear to be better students, or may simply be unaware of the phenomenon. Even the pupils' self-reporting reveals over 55% of them experiencing some problems of concentration. Although the quantitative data do not constitute evidence of a causal relationship between the experience of short-term hunger and the concentration problems reported, most teachers cited some type of inattentive behaviour, failure to concentrate or lack of engagement in class as evidence that their pupils experienced short-term hunger (see section on *Pupils' access to food and experience of short-term hunger* above). These were also described as symptoms of short-term hunger amongst pupils in the overwhelming majority of the semi-structured interviews with education stakeholders. During the focus group with teachers, one teacher described the situation thus:

With certain pupils their results suffer because at a given moment, when the teacher's explaining something, they're not there in the classroom, paying attention to what the teacher says.../... they end up not doing well in the tests or participating properly. You don't see the child smile because they've come to school hungry. Of course sometimes it might not just be problems of hunger but social problems in the family, but hunger is also one of the factors behind these. Because the mothers are peasant farmers, they can go out [to their fields] without preparing anything [for the children to eat] and when the mother comes back and begins to try and prepare something, the child has already left for school.../... and while they're in the classroom, maybe they're just marking time until they can go home and eat what the mother has prepared, then they go home to eat.

Pupils' knowledge of basic hygiene principles

Asked about their pupils' knowledge and practice of hygiene (e.g. hand washing after toilet use and before eating), the teachers' responses suggest that more pupils know about these (the majority 50%; some 30%; a few 12%; very few or none 8%) than actually observe them (the majority 32%; some 36%; a few 19%; very few or none 13%). This might in part be due to the availability of water in schools: 37% of teachers declared that their pupils always have access to water at school; 28% that they have access sometimes; 36% that they never have access to water at school¹⁰.

Questioning of the pupils reveals far higher levels of self-reported observance, with 78.41% of grade 3 pupils (83.60% in the control group) and 87.92% of grade 5 (92.49% in the control group) reporting washing their hands after going to the toilet. However, it should be borne in mind that these pupil respondents had just performed a reading test based on a text about the

⁹ Just under 1% did not respond to the question.

¹⁰ However, as anyone who deals with primary school children either professionally or as a parent knows, there is frequently a gap between their knowledge of what constitutes good hygiene practices and their practical application of that knowledge, and that gap is not restricted to Mozambique!

importance of hand washing, which is likely to have influenced them to over-report hand washing. When asked about the consequences of not washing ones hands, 77.65% of grade 3 pupils (76.40% in the control group) and 92.08% of grade 5 pupils (86.96% in the control group) included in their responses a mention of the risk of falling ill. When asked what could happen if one ate with dirty hands or after touching animals, 77.65% of grade 3 pupils (87.60% in the control group) and 89.81% of grade 5 pupils (90.33% in the control group) gave answers which revealed a basic understanding of the consequences of the transmission of germs/parasites/bacteria etc. Once again, the text they had just read can be expected to have jogged the memories of certain pupils and possibly led to more such answers than if they had been asked the question in a different context. For each of these three questions, grade 5 pupils demonstrated significantly higher knowledge than those in grade 3. Taken together, the responses from teachers and pupils suggest that, while there is a fairly high general knowledge of basic hygiene practices and the consequences of their non-observance amongst the target pupils, they are much less likely to put these into practice, in part due to a lack of hygiene facilities.

→The programme should capitalise on pupils' theoretical knowledge of basic hygiene principles, allowing this to be translated into practical application, by reinforcing basic hygiene awareness and providing access to material conditions for hand washing.

Current access to de-worming/ experience of de-worming

The survey of participating schools revealed that in 90.75% of the 226¹¹ schools for which the question was answered, their pupils currently benefit from regular de-worming treatments at school, usually once or twice a year. 88.26% of grade 3 pupils (84.40% in the control group) and 91.70% of grade 5 pupils (83.40% in the control group) reported having taken de-worming tablets at some time (the question did not specify when or how many times).

These findings were supported by the interview with the Director of the District Service of Health and Social Affairs (SDSMAS) in Manhica, who explained that, despite the mission of the Service to deliver a de-worming campaign yearly in all schools in the district, in reality, due to logistical limitations, they only achieve this in 80%-84% of schools. She further explained that her services did not have the resources (human or material) to conduct these campaigns in the best conditions: ideally the administration of de-working tablet to children should be accompanied by educational presentations to the community of the need for the treatment, also which explain the possible side effects and dispel myths and rumours about the treatment. Failure to provide this educational information may lead to parents refusing the treatment or not sending their children to school on the days it is planned¹². This is evidently an area where the programme officers would be well placed to play this educational role within the community.

The programme design, which involves even the most remote schools having regular contact with programme officers, provides the opportunity for all pupils at all intervention schools to benefit from regular de-worming. In order for this to be effective, the programme officers would need to build up understanding of and support for de-worming interventions within the community, by providing accurate information and increasing awareness of the benefits amongst community leaders and representatives, in collaboration with teachers and the school council. Regular de-worming is an essential element in combating chronic

¹¹ Out of the total 242 Programme schools

¹²The informant explained that, where this educational role is not part of the de-worming campaign, parents and community members may see parasites emerging from children's orifices after the treatment and conclude these were actually *caused* by the treatment, whereas in fact this is a common side effect of the treatment and an indication that it has been successful in eliminating the parasites.

malnutrition and micronutrient deficiencies such as anaemia and this component of the programme is therefore both a crucial and a manageable key to its overall success.

Pupil height and weight

Mean height and weight are significantly higher in the intervention than in the control group, although the differences are small (for the breakdowns and independent samples test see annex 1). As has already been pointed out, the significantly higher mean age in the intervention groups may explain this, at least in part. Over all pupils, as one would expect, a strong positive correlation is found between age and weight of ($r=.601$; $p= <.000$); between age and height ($r=.481$; $p= <.000$) and between weight and height ($r=.558$; $p= <.000$).

Height

The heights of pupils in the study were on average one standard deviation below the WHO standard, and this deviation from the standard increased with age. The year 3 intervention group pupils had a mean height of 130 cm, corresponding to the 15th percentile for their age (9 years 7 months), with a standard deviation of approximately -1 according to the WHO standard¹³. The year 3 control group had a mean height of 129cm, corresponding to the 25th percentile for their age (9 years 1 month) and a standard deviation of approaching -1 from the WHO standard. The year 5 intervention group pupils' mean height of 139 cm falls within the 5th or 15th percentile for their age (11 years 10 months),¹⁴ meaning they have a standard deviation of between -1 and -2 according to the WHO standard. The year 5 control group (mean age 11 year 3 months) has a mean height of 136cm, corresponding to the 5th percentile and a standard deviation of between -1 and -2.

These findings are wholly in keeping with the 2011 Mozambique Demographic and Health Survey finding of 23% moderate chronic malnutrition or stunting in Maputo province. However since the official survey does not disaggregate below provincial level, it is not possible to make a more detailed comparison with its findings.

Weight

The grade 3 pupils had a mean weight of 27.58kg (intervention group) and 26.15kg (control group). For their mean ages of 9 year 7 months and 9 years 1 month respectively, these correspond to the 25th quartile and a small standard deviation (of between 0 and -1) from the WHO weight standards. The grade 5 pupils had a mean weight of 33.01 kg (intervention group) and 31.77kg (control group). Unfortunately it was not possible to find WHO standards on weight for children of over 10 years, making comparisons of the grade 5 pupils' mean weight with international standards impossible. The relatively lower standard deviation for weight than for height (at least for year 3 pupils) indicates a likelihood of chronic rather than acute malnutrition overall, in keeping with the official statistics for Maputo Province. However, since the figures reported are means, they may well disguise individual cases of acute malnutrition¹⁵.

¹³ Since the figures presented here are not disaggregated by sex and the WHO standards treat girls and boys separately, these figures are not exact (although at this age there is very little gender variation in the WHO standards).

¹⁴ 5th percentile according to the WHO standards for boys; 15th percentile according to the standards for girls. Because the study data are not disaggregated by gender it is not possible to get a totally satisfactory comparison with the WHO standards.

¹⁵ Another risk of analysing means is that cases of overweight or obese children may increase the mean overall. One way of countering this risk is to remove these weights from the sample, or replace them with a dummy value. This was not done in the present case.

The programme officers responsible for collecting data on pupils' weight and heights were carefully trained in performing these measures. However, given the delicate task of obtaining reliable weight and height measures in the context of rural Mozambican primary schools (where variation may occur due to inconsistencies in methods, infrastructure and/or equipment), care should be taken when drawing conclusions on the basis of these data alone. In combination with other information, it is hoped that at the evaluation stage weight and height measures may provide useful indications of the impact of the programme interventions.

TEACHER INFORMATION

In addition to drawing on interview and focus group data and on our observations of teaching in the schools visited, some of the information presented below was based on a survey of a sample of 200 teachers, balanced in terms of sex and district, who teach in the intervention schools. Of these, 98% have received some form of pre-service training, although only 33% have received any in-service training in the past 5 years. The overwhelming majority of them are recruited and paid at the lower administrative grades: N3 (44%) or N4 (53%); and are relatively young: 56% are aged 20-29, 37% are aged 30-39.

Teachers' self reported current skills, knowledge and use of teaching techniques

Teachers reported overwhelmingly high self assessments of the quality/level of their preparation to teach (98% of responses in the two highest bands, equivalent of "good" or "very good"; five bands were offered); of their capacity to perform their teaching role (92% of responses in the two highest bands); of their knowledge of the subjects they teach (99% of responses in the two highest bands) and of the techniques and methods they learned during their training (96% of responses in the two highest bands). They were also unanimous in claiming that the techniques and methods they learned during their training are those they use in daily their teaching (100%) and that they adapt these to fit the reality of their school (97%), giving examples such as creating teaching and learning materials, using local materials for teaching or adapting materials and teaching to the local context and language, the use of group work and interactive methods.

The limited observation of teaching during the data collection suggested a rather different reality, with teachers tending to use traditional, teacher-centred "chalk and talk" methods, which were not participative and often did not involve pupils actively. This reality was exacerbated by the challenging material conditions in which most teachers were teaching (usually either under trees in the open air or in very basic classrooms with the most rudimentary furniture and equipment, if any). It is probable that the discrepancy between the teachers' self-reported skills, knowledge and use of teaching techniques and the situation observed arises, on the one hand, from a genuine lack of information about alternative, more effective and modern techniques and, on the other hand, by a desire to appear competent in their professional role (possibly combined with a fear of repercussions if they were found to be performing below expectations)¹⁶.

In contrast to these findings, 87% said they would like to use other methods, revealing an openness to evolve and discover new approaches. Asked to evaluate their knowledge of effective teaching methods, 30% considered this to be very good, 60% good,

¹⁶ These self assessments were probably not an appropriate method of gathering information from Mozambican teachers, who are wary of any possibility of information regarding them and which might undermine their careers being transmitted to their hierarchical superiors. A more discerning, objective method of data gathering was called for.

and 10% average, with only 1% claiming to have none. The focus group with teachers also revealed a desire for more access to training and to modern teaching methods:

We do need more training. Teachers always need to update their knowledge, don't they? Also in terms of methodologies, because the world is evolving and moving forward and we need to update our knowledge more than we do.../... I also need the chance to exchange experiences with other colleagues.

Overall, these findings reveal a need for on-going, improved teacher training so that teachers can be introduced to and trained in modern, child-centred teaching methods; they also demonstrate a willingness by teachers to expand their knowledge and use of teaching methods, whilst having little awareness of the alternatives available.

Teachers' current access to educational supplies and materials

Only 45% of teachers said they had access to sufficient teaching and learning materials to teach well. However, in apparent contradiction to this, 6% claimed to have very good access to teaching and learning materials, 40% good access, and 33% average access, with 10% claiming to have either little or no access. Once again, it is likely that fear of their answers being scrutinised by their superiors may have coloured some of these responses. Furthermore, the observation of teaching revealed a absence of almost any visible materials, the only resource used by most teachers being standard teachers' manuals. The teachers who took part in the teachers' focus group spoke of the difficult in teaching about subjects which are beyond the experience of their pupils (such as animals which live in other countries) when they have no means of showing or illustrating these. They also suggested a resourceful approach to teaching and learning materials, mentioning bringing objects from outside the school in to use as teaching aids, rather than only teaching from the textbook. In a few cases we observed teaching and learning materials which had been made by teachers using local materials.

→Decisions about the school materials to be provided by the programme should be taken on a school to school basis, in consultation with teachers.

SCHOOL INFORMATION

Numbers of teachers and classes per school

Within the intervention schools, the average number of teachers per school is just under 8, with slightly more male to female teachers overall (see annex 3). Only Matutuine has more female than male teachers. Schools in Manhiça have the highest average number of teachers (just over 10), followed by Matutuine (just below 8), then Magude (7.39); Moamba has the lowest average number of teachers (slightly over 6). The average number of classes per school is 8.25 overall. When broken down by district, this ranges from just over 7 in Matutuine and Moamba, to just over 11 in Manhiça (see annex 3).

Girls' and boys' enrolment, attendance and retention rates

As recorded above, the official 2011 net primary school enrolment rates in Maputo Province were 90.6% overall (91.1% male; 90.2% female; parity index 0.99). Disaggregated enrolment figures for the four intervention districts are presented in annex 3 (but are only available as totals and not as percentages of the school age children in each district). According to the Baseline survey of schools, average attendance rates in the target schools are between 76% and 86% (see annex 3). This varies according

to district and gender, the lowest rates given being somewhat above 76% in Manhiça for both girls and boys, followed by Magude (around 80% for boys and 80.5% for girls); Moambe (83% for boys; around 84.5% for girls) has similar reported rates to Matutuine (83% for boys and around 85% for girls). There is a possibility that the reported rates may be inflated or simply reported based on estimations rather than reliable, consistent attendance records. If that is the case, it may be attributable, at least in part, to the format of the survey, since respondents (usually school heads) were asked to report “annual mean percentage of presence in classes for both girls and boys” without being given a formula to use in order to calculate this figure. It may also be due to a culture of “optimistic reporting” of official information.

In order to provide an alternative source of attendance information, the programme has introduced the practice of head counts, where the programme officers turn up at a school at least once a fortnight and count the number of pupils present. Programme officers conduct headcounts without announcing their intention to do so, and varying the day they go to each school, in order to avoid pupils merely attending on the days of the head count. It is hoped the data from the head counts can be compared with the attendance statistics reported by individual schools as a method of triangulation and for use in both ongoing monitoring of attendance and for the programme evaluations.

The programme survey reports average pupil dropout rates of 15.61% for boys and 11.41% for girls; when broken down by district, these range between 9% and just over 12%, with the exception of Moamba, where girls dropout is a little over 13% and the dropout rate for boys is much higher, at almost 30%. Dropout in Manhiçais reported at around 9% for boys and 10% for girls; in Matutuine around 12% for boys and 11.5% for girls; in Magude around 11% for both boys and girls (see annex 3 for the detail and breakdown). Once again, these figures were obtained on the basis of the respondent being asked to give the “annual mean percentage of pupils dropping out of classes,” without providing a formula to calculate this. The high dropout rate for boys in Moamba may be explained in part by its location and by the practice of boys going over the border to South Africa, either to attend schools there or to find work.

→ Future surveys should provide a formula for the calculation of attendance and dropout rates and, where possible, should be complemented by additional sources of information.

School construction

The school survey revealed that just under 73% of schools are built of conventional (or mixed) materials and 21.49% of local materials. The district with the highest percentage of schools built using local materials is Magude (almost 30%). Almost 6% of schools are either built of other materials or did not respond to this question (see annex 3).

Photos showing the variety of different types of school construction in the district of Magude





Availability and condition of food preparation infrastructure in schools

The capacity to deliver school feeding effectively and safely requires the necessary infrastructure within schools. 4 conditions have been identified as prerequisites to the preparation and serving of safe, nourishing food to school children: the existence of kitchens, storage rooms to store the dry food, firewood saving stoves and a method of storing water safely. Of the 242 schools surveyed by the programme team, 30.99% (based on 221 responses to this question) have an existing kitchen of some type, although this percentage masks a wide discrepancy between the situation in the four districts (75% in Manhiça; 28.3% in Matutuine; 8.88% in Moamba; 6.25% in Magude). Only 52 schools (21.49% overall, based on 226 responses) currently have a storage room, and none currently have a firewood saving stove or kitchen water storage tank. The survey also identified those schools where materials and space were available to build a kitchen, those where energy is available etc.

School gardens

Well managed school gardens are a key to the sustainability of the programme, since in the medium and long term they can promote the local production of food, contribute to a varied and balanced diet and support teaching about nutrition in schools. 113 (46.69%) of the schools surveyed have functioning school gardens (based on 229 responses). Of the others, the survey reveals that 108 have potential access to a piece of fertile ground, which could be used to create a school garden.

Access to clean, safe water in schools

Of the 242 schools surveyed, 103 are supplied with water from a protected well, 42 have access to tap water, and 50 use water from a river, dam or open well. 56 schools have a rain collection system which, in some cases functions as an alternative source of water, in others as the only source of water. 44 schools do not have access to water. The survey also gives details of the depth of the water table, the proximity of the nearest water source, etc., but does not address the question of water quality (see annex3).

Different water sources used by schools



Presence in schools of latrines

Almost 20% of the schools surveyed had no latrines. Although latrines of some type exist in just over 80% of the schools surveyed, these vary in quality and quantity. The most common are pit latrines surrounded by a grass wall, which account for almost 50% of latrines in schools. 26.78% are pit latrines with cement walls; 12.44% are latrines with cement lids; and 11.37% are other types. The survey did not provide information about the condition or state of repair of the latrines, nor whether they have water nearby for hand washing.

191 (78.93%) schools have separate latrines for males and females, whilst 176 (72.72%) schools have separate latrines for teachers.

Different types of latrines in schools



Prevalence of active school councils

238(98.35%) of the schools surveyed claim to have active school councils. The mean number of council members reported per school is 9.91, although this figure masks considerable variation between schools, with Manhiça having an average of 11.34 council members per school, Matutuine 10.73 members, Magude 8.72 members and Moamba 8.82 members. 49.43% of school council members overall are women. In addition, all interviewees, when asked about schools councils, claimed to have active school councils in their school or district. These responses, even allowing for the likelihood of politically motivated responses, suggest that the school council is an important community group, and that mobilising and engaging with school councils and gaining their support will increase the likelihood of the programme's success.

Other school feeding interventions currently taking place in Mozambique

National school feeding programme pilot

The new school feeding programme referred to in the literature review above, has been piloted in 12 schools in 2 districts (Changara and Cahora Bassa) in Tete Province since 2012, with the objective of providing lessons towards the implementation of a sustainable school feeding programme from 2016. This is part of the National School Feeding Plan (*Programa Nacional de Alimentação Escolar: PRONAE*) which was approved on 14 May 2013. The programme, which is based on local purchasing, school production and community involvement, is being delivered with financial and technical support for the WFP and the Government of Brazil and with technical support on local production from the FAO. The M&E team and the consultant interviewed representatives of all the partner organisations (MINED Directorate of Special Programmes, Government of Brazil, WFP, FAO).

The intervention districts were selected according to the WFP's criteria of improving food security and priorities defined by the Government, including low educational performance. The presence in Changara of UNICEF's child-friendly school project, which already supports school gardens, in partnership with the FAO, was an additional factor. After evaluation, 23 districts were defined as priority and of those, two were chosen for the pilot project. It seems from the interviews conducted, that although the initial plan was to assist 79 927 beneficiaries, in 2012 the project began working in only 2 districts. It also seemed that the plan for the roll out of the programme after the pilot had not yet been clearly defined.

The WFP representative explained that the WFP supported the Government to design the school feeding model currently being piloted: this is a new decentralised approach using local procured products, bought close to the school to reduce transport costs and to provide support for the local economy (whereas previous programmes had been centrally organised and used imported products). This has the advantages of fostering community participation and ownership of programme. It is also more advantageous system for the country itself. Buying local produce from small scale producers helps improve their own food security: there is no plan to work with large scale producers at present. The programme is delivered in partnership with the FAO, on agriculture and on The FAO provides the agricultural component, teaching local farmers how to produce the food which is needed, and WFP contributes by designing strategies for local purchasing, including questions of logistic etc., in order to build capacity, with a view to the programme eventually being entirely Government owned and managed. There is also a focus on establishing synergies with other sectors, e.g. Min of agriculture, since developing a local purchasing system requires a strong focus on supporting local agriculture: having sufficient agricultural production will be essential if government is ultimately to take over the programme entirely.

The programme is decentralised and locally managed, the MINED and WFP are not involved in its ongoing management. For the pilot phase, the WFP transfers funds to the district SDEJTs, who coordinate the transfer of funds to the participating schools, but retain direct oversight of how these are used: the SDEJT essentially manages the fund. School children are given nutritionally appropriate food made from fortified maize meal, pulses, such as beans or peas, oil fortified with vitamin D and iodised salt.

The PRONAE sees nutrition education as a strong part of school curriculum. Nutritionists made available by technical assistance from Brazil contributed to the PRONAE and are now training cooks in pilot schools in the principles of planning balanced and

diversified school meals based on local products: what to cook, in what combinations, for how long, how to make a weekly menu, how to include sufficient fruit and vegetables, how many calories a child needs daily, principle of diversification etc. School gardens in pilot schools are introducing new products, not currently known to population, in an attempt to promote diversification.

In 2012, the project delivered capacity building training for programme managers. It also capacitated communities to build the necessary infrastructure (kitchens, storage rooms etc.), so that they feel ownership of the programme, as they are unable to participate financially. The participation in the training of community leaders and other community members was a priority, in order that there could be community participation within the school councils who will manage the programme. These should include at least 2 women per school.

The different implementation partners are in close contact and dialogue with ADPP and visibly enjoy an easy, open exchange of information. They appear to be genuinely prepared to share information and to learn from one another's experiences. The difference in scale is striking: whilst the national programme, run by the Government with support from two international organisations is currently being piloted in 12 schools, the programme ADP is beginning is targeting 242 schools and a total of 60 000 pupils.

WFP-supported nutrition programme delivered through health centres

The WFP informed us of a WFP-supported programme to combat malnutrition, currently being delivered through 95 health centres in 8 provinces for children from 6 months to 15 years old, who are identified as having moderate acute malnutrition, according to weight, height and upper arm measures. The beneficiary children receive 10kg of CSB per month. This is currently operating in the intervention districts of Moamba and Magude (it was operating in Manhica until 2011) but not in Namaacha, where the control group is drawn from. WFP also provides nutrition support to children living with HIV in same districts. Beneficiary children who go to school may have been included in the sample groups for the Food for Education Programme Baseline study. This may have led to the Baseline study height and weight measures of children benefiting from the WFP programme being higher than they would have been otherwise. If this were the case it would of course impact on the mean height and weight measures. However, since we have no information about the identities of the beneficiary children and how many of them may have been included in the sample group for the baseline, this is impossible to verify. Beneficiary children who go to school will also benefit in the future from the Food for Education Programme, so the existence of the WFP programme might also constitute an extraneous variable when weight and height gains of pupils in the intervention schools are assessed as part of the Food for Education Programme evaluations, if some children are effectively benefitting from two sources of feeding. It would be possible to control for this during the programme evaluations, by asking pupils in the intervention group sample if they were benefitting from nutritional supplement from another source.

→During future evaluations, pupils should be asked if they are benefitting from nutritional supplements from other sources.

Lessons from previous school feeding interventions in Mozambique

Before its progressive withdrawal in 2010-12, the WFP previously worked in several provinces, including Maputo province (in the districts of Moamba and Magude, which are two of the ADPP programmes intervention districts). The WFP's previous school feeding model for Mozambique used the same products: maize, pulses and oil, but these were imported, rather than locally

sourced. The food arrived ready and was transported to the schools. The WFP coordinated the programme, in contrast to the present decentralised system. The WFP claims that in terms of impact, the previous programme resulted in a real increase in enrolments (with an increase of 4.5% for girls and 1.5% for boys in 2011 in the assisted schools). They claim the programme was responsible for a 6% increase in children progressing into the grade 5 class (from 65% in 2011 to 71% in 2012) and an increase of about 12% progressing into grade 7. 2012 saw a reduction in the dropout rate of 10% (7% for girls) in participating schools.

When asked what lessons they would share with APDD on the basis of their experience in school feeding, the WFP and FAO informants offered the following advice:

1. Community involvement is of fundamental importance, in order to make a programme sustainable. The community need to take ownership of the programme, for example through involvement in infrastructure construction etc.
2. Government needs to be 'inside the programme' and take ownership of it, rather than feeling it belongs to the WFP (or another implementing partner).
3. All food should be consumed in school, not taken home, in order to be sure that it benefits the intended beneficiaries.
4. Nutrition and agriculture education should be a strong part of the school curriculum, supported by school gardens. N.B The FAO have developed some pedagogic materials, which are freely available on their website and can be used by other agencies with acknowledgement.
5. Always work in an integrated manner with other initiatives and partners, for example with the Multisectoral plan for the reduction of chronic malnutrition.
6. When working with the MINED, focus on close liaison and collaboration e.g. in area of teacher training.

→ Implementation of the programme should take account of the lessons learned during previous school feeding programmes.

Expectation by programme volunteers of incentives

One issue which emerged strongly from the field visits, focus groups and interviews as being likely to constitute a challenge to the implementation of the programme is the question of incentives or remuneration for programme volunteers. The programme is designed to function on a voluntary basis, with community members providing their services in order to benefit the children in their community and therefore the community as a whole; furthermore MINED policies prevent any rewards being received by volunteers. However, it became clear during the field visits that many respondents assumed that those involved with the programme would be rewarded either with payment or in kind, for example by being allowed to eat the food provided and/or take supplies home. One head teacher in particular expressed astonishment and outrage when informed by the M&E team that no incentives would be provided and predicted that in that case it would be impossible to recruit volunteers to run the programme. It also became clear that many of the programme officers had not given clear information about the purely voluntary nature of involvement and had either hinted at or promised rewards would be provided or, at the very least, had not contradicted the widespread assumption that this would be the case.

The concept of voluntary work is culturally specific and there is not a strong tradition of volunteering in Mozambique. Community members repeatedly expressed the view that, if volunteering led to individuals missing out on working time (whether this involved small scale agriculture, food preparation or other tasks contributing to the day to day functioning of their households), they should be compensated for this loss. Only from respondents in positions of responsibility did we hear the view

that the programme represented an opportunity to help the children in their community and that volunteers would be rewarded by seeing their children or the children in their community thrive.

This question was raised during almost every visit or interview conducted and of the precedent was cited of the WFP-run programmes which had operated in certain schools until recently. There was a widespread belief that volunteers running that programme had been rewarded with food to take home. When we asked the WFP representatives about this claim, they explained that, under the WFP programmes, food was only ever intended for pupils, but sometimes the volunteers were allowed to eat too. However the WFP never remunerated volunteers. When in the past, children were given dried food to take home, it is possible that the volunteers also received those “take-home rations”. But the WFP has now stopped the practice of giving children food to take home: now all food has to be consumed in school.

During the focus group with community members identified as volunteer food preparers, we heard that in the school in question a community meeting had decided that, in order to ensure the volunteers took their work seriously, parents of children benefiting from the school feeding would contribute a small amount to pay the volunteers regularly. We heard of similar decisions being taken in other communities.

It is clear that this question will need to be resolved if the programme is to run successfully. Information about the functioning of the programme needs to be clear, unambiguous and coherent. The parameters within which individual communities are able to set their own conditions regarding incentives need to be clearly defined. At least two scenarios can be imagined: a strong ethos of performing voluntary work for the good of one’s community, in particular children, for no extra personal reward, could be inculcated in communities by clear messages from the programme staff and strong leadership from programme officers. Alternatively, a decision to allow individual communities to define incentives within certain parameters might be considered more pragmatic and culturally adapted. Either of these solutions would be preferable to that prevailing at present, in terms of the success and sustainability of the programme, which currently risks being undermined by the lack of clarity.

→ As a matter of priority, a clear, realistic position should be established on the question of incentives for volunteers and communicated without ambiguity to all programme staff and volunteers.

Challenge of scaling out ADPP’s usual approach and methods to an intervention of this size

Scaling out ADPP’s usual approach and methods to an intervention of this size is an opportunity which involves significant challenges; two of these are outlined below.

For over 20 years, ADPP’s approach to its education, community development and other work in Mozambique has been based on the principle of working alongside poor communities in a participatory process which supports people to make changes, improve their lives and solve their problems. According to this vision, overcoming poverty and human development are holistic processes which involve whole communities, including children, parents, teachers, community leaders and other community members as well as local leaders, national governments and international partners. Overcoming poverty is conceived as an integrated, coordinated, community-wide challenge, combining education, adult literacy, improved livelihoods, environmental protection, health and sanitation and the empowerment of women (ADPP, 2012). ADPP’s interventions in Mozambique are based on this community-based approach and on having trained, convinced, dedicated workers who are prepared to spend time and energy working alongside the beneficiaries of their programmes. For example, the Total Control of the Epidemic programme

to combat HIV&AIDS, educate people about the epidemic, mobilise them to know their status and to change behaviour in response to the epidemic, which has functioned with significant success since 2000 in Mozambique, is based on a team of trained, committed programme officers who are based within communities and who go out to meet and engage with people, talking with them and supporting them in making changes in their lives(ADPP, 2012).

The same model is the basis for the Food for Education Programme, where a team of 40 programme officers, 10 of whom are based in each of the 4 districts, are expected to create close links and work closely with the beneficiary schools, school councils and communities, supported by a coordinating team and a logistical team. Each officer is responsible for between 4 and 7 schools (usually 5 or 6) depending on the geography and distances involved. They are also required to liaise closely with the district coordinator and to serve as a conduit for information, including monitoring data, between the schools and the coordinator. This model is ambitious, given the geography, the transport challenges and the cultural and sociological characteristics of the communities involved. In order to function as intended, it requires highly trained, highly motivated and convinced individuals, imbued with the ADPP ethos and work ethic. Our field visits, the training workshop we conducted for the programme officers and extensive conversations with different members of the programme team revealed that, while some of the programme officers – often but not exclusively those who have a previous experience of working on an ADPP programme – possess these characteristics, there are many others who do not, or not yet. The speed with which the team was recruited, the relatively low salaries they receive and the lack of training they have received so far were all cited as reasons for there being a significant number of programme officers who did not appear convinced by or totally committed to the programme, or even to completely understand its objectives and methods, let alone share the vision of hard work and service on which it depends. This is one of the reasons for the ambiguity prevailing in certain communities around the question of incentives for volunteers reported above. Scaling the ADPP model out to a programme of this size will only be possible if significant steps are taken to improve the profile of a significant proportion of the programme officers, either through improved training, communication and inculcation of the ADPP values, or through replacing them with individuals who have a more suitable profile. It may be necessary to increase the reward package offered to programme officers, in order to attract and/or retain officers of the necessary profile to contribute successfully to achieving the programme objectives.

→The training and motivating of the team of programme officers and improving communications with them should be a priority; where programme officers are manifestly not committed to the programme they should be replaced.

Another challenge associated with up scaling ADPP's usual approach to the current programme is the question of information and data management. It was clear from speaking to ADPP management and staff, and this was confirmed once the process of data collection and processing for the Baseline study began, that the volume of information and data which will require processing in order to fulfil with the programme M&E plans alone exceeds ADPP's current technical (and probably human) capacity. The M&E of the programme, which involves individual level data for 60 000 pupils, plus the other beneficiaries, to be collected, entered, stored and processed, requires a dedicated data base. Currently the data is being managed using individual Excel workbooks, which are not integrated¹⁷.

→ A dedicated data base for the programmeshould be acquired and installed as soon as possible and programme staff adequately trained in its use.

¹⁷ This was evident during the preparation of the current report: the sheer volume and complexity of data to be collated, cleaned and processed using only Excel workbooks, before being analysed, made the process long and arduous.

Need for the food provided to pupils to be fortified in line with their nutritional needs

All the respondents with nutritional expertise expressed the strongly held view that, because of the high levels of anaemia and iodine deficiency amongst children in Mozambique, both of which can lead to educational problems, amongst other consequences, it is important that school feeding programmes should provide iron, vitamin A and iodine. They should also be accompanied by de-worming, since parasites are implicated in anaemia. It is also crucial that such programmes include a nutrition education component, so that children learn how to eat healthily and to take responsibility for their own nutrition and wellbeing. Girls approaching adolescence in particular should receive iron supplements and de-worming treatments as well as nutrition education so that they can learn to look after their own nutritional status.

→ Verify the CSB being provided is fortified, as per the contract with USDA, and that it contains iron, vitamin A and iodine in accordance with the nutritional needs of children in Mozambique.

Summary and conclusions

One of the main objectives of the baseline study is to provide pre-intervention measures against which to measure the subsequent impact of the programme's interventions. Based the baseline measures, targets will be defined for each indicator at specific milestones in the programme and at the end of the programme.

The measures identified by the Baseline study for each of the output indicators are summarised below. The table below, which is adapted from the programme's Evaluation Plan, sets out the programme's target Intermediate Results (IRs) in the first column, followed in the second column by the indicators which will be used to measure these. The third column has been added in order to present the Baseline measures are identified by the Baseline study.

(N.B. IRs marked with an asterisk in the table below are important steps in the intervention logic and underlying Theory of Change but which do not come under the programme formal Results Framework. They will be evaluated by a special study, to be conducted at the same time as the mid-term and final evaluations).

Table 1: Baseline measures of Indicators by which Intermediate Results will be measured

Outputs (Intermediate Result)		Indicators	Baseline measures
MGD SO1	Improved literacy of school-age children	<ul style="list-style-type: none">Percentage increase of children in participating schools passing the trimestrial literacy testScores of sample children in independent reading tests	<ul style="list-style-type: none">74.42% grade 3 pupils passing term literacy test¹⁸Grade 3: 14.8% (Grade 5: 47.55%) read fluently without problems or fluently with some hesitation (bands 1 and 2)
MGD 1.1	Improved quality of literacy instruction	Number of teachers in target schools who demonstrate use of new and quality teaching techniques and tools	0
MGD 1.1.2	Better access to school	Number of schools receiving school supplies and materials as a result of	0

¹⁸ However, due to the discrepancy between this figure and the results of the independently conducted reading test, this should be considered with extreme caution as a baseline figure.

	supplies and materials	USDA assistance	
MGD 1.1.4	Increased skills and knowledge of teachers	<ul style="list-style-type: none"> Number of teachers anticipated to graduate as a result of USDA assistance Increase in trainee test scores as result of teacher training Increase in teachers' knowledge and skills Number of teachers using new/or improved teaching techniques in the classrooms Number of teachers and student teachers who successfully complete nutrition and health trainings 	<ul style="list-style-type: none"> 0 Tests planned at beginning of teacher training programme¹⁹ Narrative description of teachers' knowledge and skill 0 0
MGD 1.2*	Improved attentiveness	<ul style="list-style-type: none"> Number of target learners who report improved attentiveness in the classroom Number of teachers who report increased learner attentiveness in the classroom 	<ul style="list-style-type: none"> Pupils report problems concentrating in class 14.34% "often", 40.89% "from time to time", 43.80% "no" Teachers report pupil problems concentrating in class 12% "frequently", 85% "sometimes", 3% "never".
MGD 1.2.1*	Reduced short term hunger	<ul style="list-style-type: none"> Number of target learners who report reduced short-term hunger in the classroom Number of teachers who report reduced short-term hunger of learners in the classroom 	<ul style="list-style-type: none"> Pupils report hunger 58.24% "sometimes", 39.83% "during interview". Teachers report pupils appear hungry 12% "frequently", 74% "from time to time", 2% "never".
MGD 1.3	Improved student attendance	<ul style="list-style-type: none"> Percentage of pupils regularly (80%) attending USDA supported schools Percent increase in regular attendance by year. 	<p>Manhiça: 76% (F), 76% (M) Magude: 80.5% (F), 80% (M) Moamba 84.5% (F), 83% (M) Matutuine 86% (F), 83% (M) as reported by school (to be triangulated with head counts)</p>
MGD 1.3.2*	Reduced health-related absence	<ul style="list-style-type: none"> Number of parents reporting fewer health-related absences of their children Percentage of pupils regularly (80%) attending USDA supported schools 	<ul style="list-style-type: none"> 0 Manhiça: 76% (F), 76% (M) Magude: 80.5% (F), 80% (M) Moamba 84.5% (F), 83% (M) Matutuine 86% (F), 83% (M) as reported by school
MGD 1.3.3	Improved school infrastructure	<p>Number of schools where constructed or rehabilitated</p> <ul style="list-style-type: none"> kitchens storage rooms firewood saving stoves kitchen water storage tanks <p>are in good condition and in use</p>	<ul style="list-style-type: none"> 75 (30.99%) have kitchen "of some type" 52 (21.49%) have storage room 0 have firewood saving stoves 0 have kitchen water storage tanks

¹⁹ Since the teacher training programme begins in January, it was not possible to collect information on this measure for the Baseline study. The EPFs will conduct pre-tests with each intake of trainees and conduct post-training tests at the end of their training.

		Number of latrines at target schools constructed or rehabilitated	194 (80.17%) have one or more latrine (condition and availability of water not specified)
MGD 1.3.4	Increased student enrolment	<ul style="list-style-type: none"> Number of pupils enrolled in school as a result of USDA assistance. Number of after-school learning clubs formed 	<ul style="list-style-type: none"> 90.6% enrolment (91.1% male; 90.2% female) 2011 Maputo Province (and see figures by district in annex 3) 0
MGD 1.2.2.1	Increased access to food	<ul style="list-style-type: none"> Number of school-aged children receiving a daily meal at school as a result of USDA assistance Number of school gardens established 	<ul style="list-style-type: none"> 0 113 (46.69%)
MGD SO2	Increased use of health and dietary practices	<ul style="list-style-type: none"> Percentage increase in learner weight Percentage increase in learner height 	<ul style="list-style-type: none"> Mean weight grade 3: 27.58 kg at mean age 9.56 years; grade 5: 33.01 kg at mean age 11.83 years. Mean height grade 3: 130 cm at mean age 9.56 years; grade 5: 139 cm at mean age 11.83 years.
MDG 2.1*	Improved knowledge of health and hygiene practices	Percentage of students that demonstrates acceptable knowledge of health and hygiene practices	<p>Pupil basic understanding grade 3: 77.65%; grade 5: 92.08%.</p> <p>Pupil reported hand washing grade 3: 78.41%; grade 5: 87.92%.</p>
MDG 2.2*	Increased knowledge of safe food preparation and storage practices	Percentage of food preparers at target schools trained in hand washing, safe food preparation and storage practices	0
MGD 2.3	Increased knowledge of nutrition	<ul style="list-style-type: none"> Number of students who are taught by teachers trained in nutrition and health trainings Number of people trained in child health and nutrition messages as a result of USDA assistance. Percentage of food preparers at target schools trained in good nutrition and dietary practices. Number of school gardens established 	<ul style="list-style-type: none"> 0 0 0 113 (46.69%)
MGD 2.4	Increased access to clean water and sanitation services	<ul style="list-style-type: none"> Number of schools with access to clean, safe water source Number of Clean Water Systems at target schools constructed or rehabilitated Number of latrines at target schools constructed or rehabilitated 	<ul style="list-style-type: none"> 192 schools have access to water of some type (quality not known) 0 194 (80.17%) schools have one or more latrine (condition and availability of water not specified)
MGD 2.5	Increased access to preventative health interventions	<ul style="list-style-type: none"> Number of students receiving de-worming tablets twice a school year 	<ul style="list-style-type: none"> 90.75% schools claim de-worming interventions once or twice yearly 88.26% grade 3 pupils; 91.70% grade 5 pupils claim have had de-worming at some time

MDG 2.6*	Increased access to requisite food preparation and storage tools and equipment	<ul style="list-style-type: none"> • Number of kitchens at target schools constructed or rehabilitated. • Number of storage rooms at target schools constructed or rehabilitated. • Number of firewood saving stoves at target schools constructed or rehabilitated. • Number of kitchen water storage tanks distributed at target schools. • Number of sets of bowls and utensils distributed at target schools. 	<ul style="list-style-type: none"> • 75 (30.99%) schools have kitchen “of some type” • 52 (21.49% have storage room • 0 have firewood saving stoves • 0 have kitchen water storage tanks • 0 bowls and utensils distributed
MGD 1.4.1 MGD 2.7.1	Increased capacity of government institutions	Number of government officials trained in nutrition and benefits of school feeding	0
MGD 1.4.4/ MGD 2.7.4	Increased engagement of local organisations and community groups	<ul style="list-style-type: none"> • Number of School Feeding Committees formed or strengthened • Number of School Feeding Committee manuals distributed • Number of school councils contributing to their school as a result of USDA assistance 	0 0 238 (98.35%) schools claim to have active school councils

In addition to the information summarised above, the baseline report identifies a number of factors which are potentially of crucial importance to the success of the programme and which should be carefully considered in planning implementation, which lead to a number of suggested action points already presented:

- During future evaluations, pupils should be asked if they are benefiting from nutritional supplements from other sources.
- Implementation of the programme should take account of the lessons learned during previous school feeding programmes.
- As a matter of priority, a clear, realistic position should be established on the question of incentives for volunteers and communicated without ambiguity to all programme staff and volunteers.
- The training and motivating of the team of programme officers and improving communications with them should be a priority; where programme officers are manifestly not committed to the programme they should be replaced.
- A dedicated data base for the programme should be acquired and installed as soon as possible and programme staff adequately trained in its use.
- Verify the CSB being provided is fortified, as per the contract with USDA, and that it contains iron, vitamin A and iodine in accordance with the nutritional needs of children in Mozambique.

Despite the challenges set out above, there is a general enthusiasm for the programme on the part of the education authorities and of beneficiaries and a belief that it will help to improve school attendance and outcomes. This is in particular true of schools and communities which had previously benefited from the WFP school feeding programme and regret its loss. This generally positive attitude represents an opportunity for ADPP to capitalise on. Provided the areas of concern are addressed, the evidence found during the Baseline study provides many reasons to believe the programme should achieve its objectives.

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Annex: 1 Table comparing the characteristics of the intervention and control groups based on data collected through interviews with pupils

	Grade 3 students			Grade 5 students		
	Intervention group	Control group	Independent samples test	Intervention group	Control group	Independent samples test
Number of students	264	250		265	253	
Sex ²⁰	49.24 % female; M= 1.49; SD=.501	48.40% female; M= 1.48; SD=.501	t=.191; df=512; p=0.849	49.81 % female; M= 1.50; SD=.501	48.22% female; M=1.48; SD=.501	t=.361; df=516; p=.718
Age	M=9.56 years; SD=1.847	M=9.08 years; SD=1.486	t= 3.2; df=510; p=.001	M=11.83 years; SD=1.595	M=11.23 years; SD=1.382	t=4.514; df=516; p<.000
Weight	M=27.58 kg; SD=5.801	M=26.15 kg; SD=6.415	t=2.645; df=512; p=.008	M=33.01 kg; SD= 7.667	M=31.77 kg; SD=7.160	t=1.899; df=516; p=.058
Height	M=130 cm; SD=.110	M=129 cm; SD=.140	t=1.410; df=510; p=.155	M=139cm; SD=.111	M=136 cm; SD=.127	t=3.255; df=515; p=.001
A Reading and comprehension test						
1. Reading test ²¹						
a reads fluently	5.68%	10.00%		23.02%	26.48%	
b some hesitation	9.09%	14.00%		24.53%	22.13%	
c difficulties finishes	19.69%	19.20%		20%	12.25%	
d difficulties does not finish	17.42%	27.60%		13.21%	13.44%	
e reads nothing	48.11%	29.20%		19.25%	25.30%	
N/R					0.40%	
	M=1.07; SD=1.247	M=1.48; SD=1.312	t=3.649; df=512; p<.000	M=2.19; SD=1.428	M=2.88; SD=1.568	t=-.502; df=516; p=.616
2.Basic understanding of text and topic y/n	(151) 57.20%; SD=.495	(136) 54.4%; SD=.499	t=-.636; df=510; p=.525	(208) 78.49%; SD=.412	(173) 68.38%; SD=.463	t= -2.411; df=513; p=.016
3.Further understanding i						
0	14.02%	14.00%		6.04%	9.49%	
1	42.05%	46.40%		36.23%	36.36%	
2	26.52%	22.80%		28.30%	25.69%	
3	14.39%	13.60%		19.25%	20.95%	
4	3.03%	3.20%		10.19%	7.11%	
N/R					0.40%	
	M=1.50 ²² ; SD=1.002	M=1.46; SD=.998	t=.542; df=512;p=.588	M=1.91; SD=1.096	M=1.80; SD=1.098	t=1.198; df=515; p=.232

²⁰ Percentages are presented here since these are more meaningful to the general reader. The Means as calculated by SPSS are based on the conversion of textual values into numerical values in order to analyse these in SPSS (i.e. 1 for yes; 2 for no).

²¹ Pupils were classified on the following scale:

- a) reads aloud fluently without problems (equivalent of 5)
- b) generally reads fluently but hesitates over some words (equivalent of 4)
- c) has difficulties reading but manages to finish the text (equivalent of 3)
- d) has difficulties reading and does not manage to finish the text (equivalent of 2)
- e) does not manage to read anything in the text (equivalent of 1)

Here means are a function of the breakdown above and should be read as a mean score out of 5.

4. Further understanding ii						
0	20.83%	15.60%		11.70%	6.72%	
1	68.56%	70.80%		71.32%	73.12%	
2	9.85%	13.60 %		16.98%	18.58%	
N/R	(2) 0.76%				1.58%	
	M=0.89 ²³ ; SD=.546	M=0.98; SD=.541	t=-1.887; df=510; p=.060	M=1.06; SD=.554	M=1.12; SD=.493	t=-1.296; df=512; p=.196
B. Interview responses						
1. takes to school						
a pen	90.15%	94.00%		94.34%	95.26%	
b exercise book	95.45%	93.20%		96.60%	95.65%	
c school bag	74.62%	73.60%		77.74%	77.47%	
2a hungry ²⁴ sometimes	61.36%; M=1.39; SD=.488	54.00%; M=1.46; SD=.499	t=-1.640; df=511; p=.102	58.11%; M=1.41; SD=.494	59.29%; M=1.41; SD=.492	t=.169; df=514; p=.866
b hungry now	40.91%; M=1.59; SD=.493	38.00%; M=1.62; SD=.486	t=-.744; df=510; p=.457	36.60%; M=1.63; SD=.483	43.87%; M=1.56; SD=.497	t=1.654; df=515; p=.099
c ate before school	54.55%; M=1.44; SD=.497	70.80%; M=1.29; SD=.456	t=3.484; df=505; p=.001	53.96%; M=1.45; SD=.499	58.50 %; M=1.42; SD=.494	t=.847; df=512; p=.397
3. attention problems ²⁵						
often	15.91%	11.20%		14.72%	15.42%	
sometimes	50.38%	39.60%		42.64%	30.43%	
no	33.33%	47.60%		41.51%	53.36%	
N/R	0.38%	1.60%		1.13%	0.80%	
	M=.83; SD=.682	M=.63; SD=.680	t=3.227; df=507; p=.001	M=.73; SD=.705	M=.62; SD=.741	t=1.746; df=511; p=.081
4a number of times eats daily						
0	-	-		-	-	
1	6.06%	6.40%		4.15%	4.74%	
2	55.30%	48.80%		46.42%	35.57%	
3	35.98%	41.20%		44.53%	55.73%	
4	2.27%	2.80%		4.91%	3.77%	
5	-	0.40%		-	0.79%	
N/R	0.38%	0.40%		-	0.40%	
	M=2.35; SD=.629	M=2.42; SD=.674	t=-1.245; df=510; p=.214	M=2.50; SD=.658	M=2.59; SD=.665	t=-1.536; df=515; p=.125
b number of times ate yesterday						
0	-	-		-	0.79%	
1	15.15%	16.40%		6.04%	9.49%	
2	50.00%	50.00%		50.94%	43.08%	

²² Based on a total of four possible answers, so should be read as a mean score out of 4.

²³ Based on a total of two possible answers, so should be read as a mean score out of 2.

²⁴ This and the following results are presented as percentages since these are more meaningful to the general reader. The Means as calculated by SPSS are based on the conversion of textual values into numerical values in order to analyse these in SPSS (i.e. 1 for yes; 2 for no).

²⁵ These results are presented as percentages since these are more meaningful to the general reader. The Means as calculated by SPSS are based on the conversion of textual values into numerical values in order to analyse these in SPSS (i.e. 0 for no; 1 for sometimes; 2 for often).

3	31.44%	30.40%		38.11%	45.06%	
4	2.27%	2.40%		4.53%	0.79%	
5	0.38%	0.80%		0.38%	0.40%	
N/R	0.76%	-		-	0.40%	
	M=2.22; SD=.741	M=2.21; SD=.770	t=.140; df=510; p=.888	M=2.42; SD=.693	M=2.37; SD=.716	t=.865; df=515; p=.387
6.washes hands after toilet	78.41%	83.60%		87.92%	92.49%	
7. mentions illness as consequence	77.65%	76.40%		92.08%	86.96%	
8.basic understanding of consequences	77.65%	87.60%		89.81%	89.33%	
9.deworming treatment ²⁶	88.26% M=1.10; SD=.301	84.40% M=1.15; SD=.360	t=-1.775; df=506; p=.076	91.70% M=1.08; SD=.271	83.40% M=1.16; SD=.367	t=-2.818; df=513; p=.005

²⁶These results are presented as percentages since these are more meaningful to the general reader. The Means as calculated by SPSS are based on the conversion of textual values into numerical values in order to analyse these in SPSS (i.e.1 for yes; 2 for no).

Annex 2: Table summarising grade 3 pupils' term test scores as provided by DPEC

	Intervention group	Control group
Total pupils	1654	500
Mathematics		
<10	22.73%	14.00%
10-15	51.27%	40.00%
>15	26.00%	46.00%
Portuguese		
<10	25.57%	21.20%
10-15	49.21%	50.40%
>15	25.21%	28.40%
Total boys	837	250
Mathematics		
<10	25.45%	14.40%
10-15	49.94%	40.80%
>15	24.61%	44.80%
Portuguese		
<10	29.39%	23.20%
10-15	48.98%	52.00%
>15	21.62%	24.80%
Total girls	817	250
Mathematics		
<10	19.95%	13.60%
10-15	52.63%	39.20%
>15	27.42%	47.20%
Portuguese		
<10	21.66%	19.20%
10-15	49.45%	48.80%
>15	28.89%	32.00%

Annex 3: Table summarising school level information obtained through questionnaires completed by directors of intervention schools

	Manhiça	Matutuine	Magude	Moamba	Total
Number of beneficiary schools	68	53	64	57	242
Enrolment male	15 175	4 155	6 481	6 363	32 174
Enrolment female	14 820	4 507	6 356	5 850	31 533
Enrolment total	29 995	8 662	12 837	12 213	63 707
Attendance male (average %)	76.68%	82.97%	79.48%	83.08%	80.55%
Attendance female (average %)	76.32%	85.33%	80.47%	84.57%	81.67%
Dropout male (average %)	9.15%	12.27%	11.24%	29.78%	15.61%
Dropout female (average %)	9.83%	11.53%	10.94%	13.32%	11.41%
Number of teachers male (average)	5.76	3.66	3.75	3.53	4.18
Number of teachers female (average)	4.5	4.19	3.64	2.49	3.71
Number of teachers total (average)	10.18	7.85	7.39	6.02	7.86
Number of classes(average)	11.18	7.15	7.52	7.14	8.25
School construction					
Conventional	44	37	44	49	174
	64.71%	69.81%	68.75%	85.96%	71.90%
Mixed materials	0	2	0	0	2
	0%	3.77%	0%	0%	0.83%
Local materials	15	11	19	7	52
	22.06%	20.75%	29.69%	12.28%	21.49%
Others or N/R	9	3	1	1	14
	13.24%	5.66%	1.56%	1.75%	5.79%
Water					
Protected well or pump	43	27	22	11	103
	63.24%	50.94%	34.38%	19.30%	42.56%
Tapwater	3	6	11	22	42
	4.41%	11.32%	17.19%	38.60%	17.36%
River or open well	8	6	17	19	50
	11.76%	11.32%	26.56%	33.33%	20.66%
Existence of a river or lake nearby	26	18	33	33	110
	38.24%	33.96%	51.56%	57.90%	45.45%
Existence of a rain water collection system	10	18	11	17	56

	14.71%	33.96%	17.19%	29.82%	23.14%
Latrines					
Schools with one or more latrine	56	49	46	43	194
	82.35%	92.45%	71.88%	75.44%	80.17%
Schools where separate male and female latrines	55	49	46	41	191
	80.88%	92.45%	71.88%	71.93%	78.93%
Schools where separate latrines for teachers	53	42	40	41	176
	77.94%	79.25%	62.50%	71.93%	72.72%
Type of latrine (only one type counted per school ²⁷)					
pit with grass	40%	32%	47.06%	78.57%	49.41%
pit with cement walls	29%	42%	31.37%	4.76%	26.78%
cement lid	22%	16%	11.76%	0%	12.44%
other	9%	10%	9.81%	16.67%	11.37%
School councils					
Active school council	67	51	64	56	238
	98.53%	96.23%	100%	98.25%	98.35%
Average number of school council members per school (male)	6.05	4.81	4.30	4.80	4.99
Average number of school council members per school (female)	5.31	5.94	4.43	4.04	4.93
Schools where de-worming regularly takes place	61	45	63	49	218
	89.71%	84.91%	98.44%	85.96%	90.08%
Schools with garden	36	38	25	14	113
	52.94%	71.70%	39.06%	24.56%	46.69%
Schools without garden with access to fertile land	14	12	39	43	108
School kitchens					
Schools with kitchen ²⁸	51	15	4	5	75
	75%	28.3%	6.25%	8.88%	30.99%
Schools without a kitchen	8	38	60	51	157
	11.76%	71.70%	93.75%	89.47%	64.88%
Schools with wood saving stove	0	0	0	0	0
School with existing cupboard to store food	13	13	12	14	52

²⁷ Percentages based on number of responses for each question

²⁸ Percentages based on number of responses for each question

products	19.12%	24.53%	18.75%	24.56%	21.49%
Activities					
Extracurricular activities	68	46	64	53	231
	100%	86.79%	100%	92.98%	95.45%
Help with homework	10	19	31	24	84
	14.71%	35.85%	48.44%	42.11%	34.71%
External assistance: help received from NGO or church	4	6	10	15	35
	5.88%	11.32%	15.63%	26.32%	14.46%