Fighting Hunger Worldwide

Impact Evaluation

WFP Cambodia School Feeding 2000-2010: A Mixed Method Impact Evaluation

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Background and Context

1. The Cambodia School Feeding Impact Evaluation is part of a series of evaluations commissioned by World Food Programme's (WFP) Office of Evaluation. The purpose of the Cambodia Impact Evaluation is to evidence intended and unintended effects of the WFP Cambodia School Feeding Programme.

2. The objectives of the impact evaluation are:

   a) To evaluate the outcomes and impact achieved so far from the various modalities that have been used in relation to stated educational and gender objectives;

   b) To evaluate outcomes and impact achieved in relation to WFP's new social safety net policy objectives (although these were not explicitly included in the programme design) and to assess the extent to which the programme has met, or has the potential to meet, these; and

   c) To identify changes needed to enable fulfilment of potential to contribute optimally to Cambodian objectives and the objectives of the current WFP Strategic Plan and 2009 School Feeding Policy.

3. The subject of evaluation is the three Protracted Relief and Recovery Operations (PRROs) in Cambodia from 2001 to 2010. These operations were designed before WFP's executive board approved the School Feeding Policy in 2009.

4. The evaluation applies a mixed methods approach, essentially consisting of quantitative and qualitative data collection methods which complement each other. Schools were pre-identified according to strata that correspond to different components of the Cambodian School Feeding Programme; Take Home Rations (THRs) and School Meals Programme (SMP) as well as non-targeted schools and schools with child-friendly activities. Across these strata, 108 schools were identified, of which 30 were control schools. At each school, a number of pupils were randomly identified, typically between 15 and 20 and the household survey was carried out in their homes. In total, 2,014 household surveys were carried out as part of the impact evaluation. Apart from relevant socio-economic data, the household survey included anthropometry measures, haemoglobin measurement, asset scores and food security assessments. Iron deficiency anaemia, is endemic in Cambodia, but data on school-age children is very limited. Nonetheless, the evaluation team was able to study this aspect by partnering with Helen Keller International (Cambodia Office).

5. A school survey was designed within the same strata and included 53 schools and 1,227 standardised tests among sixth grade students. Finally, econometric analysis was carried out on key data from the Ministry of Education's Education Management Information System, covering the period from 2001-2010. The analysis included panel data, standard cross-section regression and matching.

6. The evaluation faced some methodological challenges, mainly related to assessing income generation and effects on assets. In the absence of baseline information on key indicators, the analysis was limited to counterfactual assessment as at the time of the evaluation.

Cambodian Context

7. Despite economic growth in recent decades, large parts of the population in Cambodia still lives in poverty, making Cambodia one of the poorest countries in South East Asia. Cambodia has an estimated population of 13.4 million of which 30% still lives below the national poverty line. While Cambodia has surplus production of food, food insecurity, particularly significant during lean season, still affects more than 10% of the population – or an estimated 1.7 million. The main causes of food insecurity are limited livelihood opportunities and recent economic shocks, including the price of food, have contributed to a deterioration of household purchasing power, poor access to sufficient and diverse food, the low productivity among small-scale farmers or the lack of access to land for the poorest households. Exposure to floods and droughts also adds to the vulnerability of poor households.

8. Cambodia's recent history has been characterised by persecution, war, displacements which all have detrimental effects on the country's social and economic situation, especially in education. Today, education in Cambodia is characterised by deteriorated physical infrastructures and a vast shortage of qualified teachers. Despite strong efforts to rebuild the system, the quality of education services still remains an unresolved challenge. Although Cambodia has made considerable progress in expanding basic education in recent years, major concerns still remain related to high drop-out and low retention rates and an acute shortage of trained teachers, especially in remote rural areas.

9. According to the National Strategic Development Plan (2006-2010), the Cambodian Government is committed to ensuring equitable access to universal basic education for all children as well as reducing financial burden of poor students, amongst others. The School Feeding Programme is well aligned to national strategy framework. As for education, the programme support efforts to increase enrolment and ensure that pupils complete primary education; net enrolment rates in Cambodia reached 95% in the 2009/10 school year, up from just above 90% over a five year period; average completion rates are 83%, but with large national variations, some areas have completion rates as low as 43%.

10. Nutrition and food security is amongst the Cambodian Governments key priorities, according to the National Programme for Household Food Security and Poverty Reduction (2007-2011). Amongst its objectives is: Improved basic health of food insecure and vulnerable people. The health has seen improvements in recent years. According to the Cambodia Demographic and Health Survey (2005), there have been remarkable improvements in the health and nutrition status of the population since 2000; infant mortality rate (IMR) declined from 95 to 66 deaths for every 1,000 live births, and the under-five mortality rate declined from 124 to 83 for every 1,000 live births. Still, 39.5% of children under five are stunted, 28.8% are underweight and 8.9% are wasted (CAS 2008) and one in every 11 Cambodian children dies before reaching five years of age (2008). Thus, despite the progress made, the health status of the Cambodian people is still among the lowest in South East Asia.

11. Economic progress in recent decades has not favoured all parts of the population, and as a result, inequality has risen during the recent decade, maintaining many Cambodians in a marginalised and vulnerable situation. In order to reach out to the most vulnerable part of the population, the Cambodian Government has formulated and National Social Protection Strategy (NSPS) 2010, with support from WFP and the World Bank. It is NSPS's priority to develop social safety net interventions to benefit the poorest and most vulnerable Cambodians.

School Feeding Interventions From 2001 - 2010

12. A PRRO starting in 2001 included the first WFP school feeding component in support to basic education. During the period from 2001 to 2010, the School Feeding Programme experienced a considerable increase in numbers of beneficiaries, rising from 291,593 in 2002 to 482,961 in 2009, peaking in 2006 with more than 610,000. The decrease from 2006 was due to lack of funding (commodities) and rising food prices. Nonetheless, the School Feeding Programme (SFP) has reached a significant 20% of total primary education students in the 2009/10 school year in 1,624 out of 6,665 schools in country.

13. The period under evaluation has seen a significant change in terms of intervention targeting. Gradually, more vulnerable parts of the population have been targeted at the same time as school feeding interventions have been prioritised. On the basis of vulnerability assessments, coverage has changed from being country-wide to focusing on the most food insecure communities in 12 of the country's 24 provinces.

Scope and Modality

14. The SFP uses two modalities: an early morning meal (SMP) for primary students in targeted schools, this modality makes up for 45% of resources under the Cambodian school feeding programme. The other modality is the THR benefitting the poorest students in grades four through six, representing 18% of school feeding resources. Some schools also use a combination of both modalities; this is the case for 37% of the total school feeding resources for Cambodia. The age group targeted through the different modalities is between 6 and 11 years in grades one to six.

15. WFP has also reduced the number of partners in line with the geographical targeting. The result of this process is a focus on more strategic partners, including national and international non-governmental organisations (NGO) and governmental institutions. United Nations Children's Fund (UNICEF) is also a partner to WFP and both organisations have promoted the Child-Friendly School (CFS) concept in Cambodia since 2006. This concept includes activities which are part of the Essential Package; more than 600 schools benefit from this partnership.

Strategic Alignment

16. The school feeding activities are aligned with WFP's Strategic Objective (SO) 4 – Reduce Chronic Hunger and Undernutrition[1] .Furthermore, school feeding activities carried out in Cambodia are coherent with WFP's School Feeding Policy, approved by the Executive Board in November 2009.

Outcomes and Impact of School Feeding

Education

Enrolment

17. The evaluation has demonstrated that there is a significant effect on enrolment; analysis of Ministry of Education's data reveals an effect between 2-2.5% when a school is incorporated into the School Feeding Programme; interestingly the effect is stronger on girls´ enrolment, reaching levels between 2.4 and 3%. A direct comparison of schools that were not part of the

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[1] Under the Programme Category Review WFP/EB.A/2010/11/ Rev.1 (June 2010), PRROs will be designed in support to SO1 and SO3 while CP or DEV will be designed in support to SO4.

SFP in 2002 but included in 2009, reveals an increase in enrolment of 6.1% more compared to schools that were neither included in 2002 nor 2009. Both effects are marked and clear indications that school feeding is a strong incentive for parents to send their children to school. However, the positive effect is only sustained for as long as the school benefits from the programme.

Attendance

18. Concerning attendance, the household survey showed that *only* THR have a significant effect on attendance, contributing to an annual increase of between 2.4% and 3.2%; effects from SMP marked a somewhat positive tendency, but they were not significant. Furthermore, the same survey showed that thanks to THR, attendance among female students is markedly more regular than that of male students. THR, therefore, is fulfilling its objectives of incentivising attendance among students in grades four through six. Interviews highlighted the effect of early morning SMP on punctuality.

Promotion and Repetition

19. Using the Ministry of Education's own education data, the evaluation demonstrates that there are tendencies of positive effects on promotion rates, particularly among girls but only with statistical significance in grade four. In terms of repetition rates, the statistical analysis showed that School Feeding Programmes tend to lower repetition rates, but the result is only significant in grade one.

Difference in Promotion Rates (Targeted vs. Non-targeted schools)
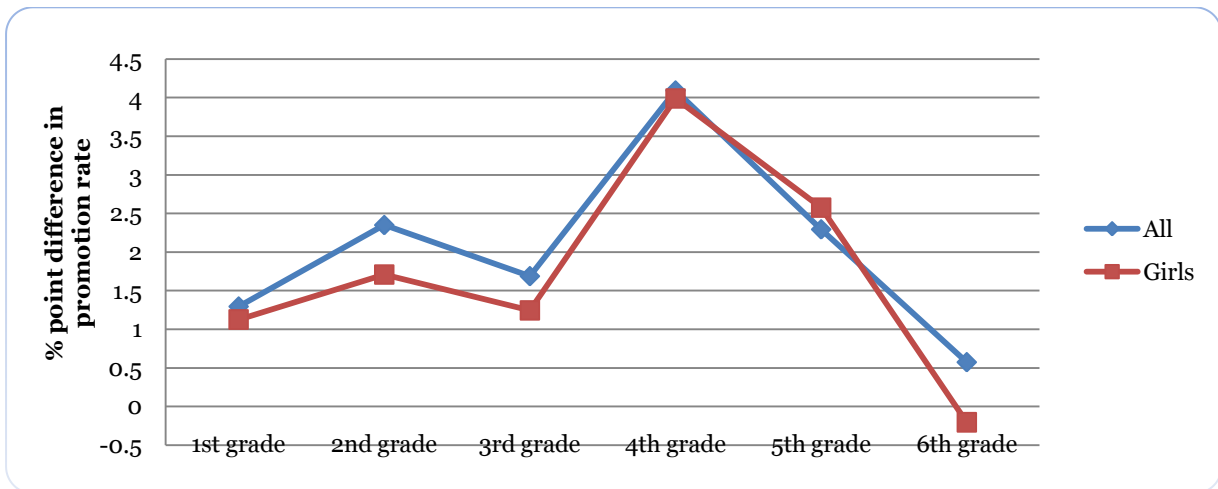
Difference in Repetition Rates (Targeted vs. Non-targeted schools)
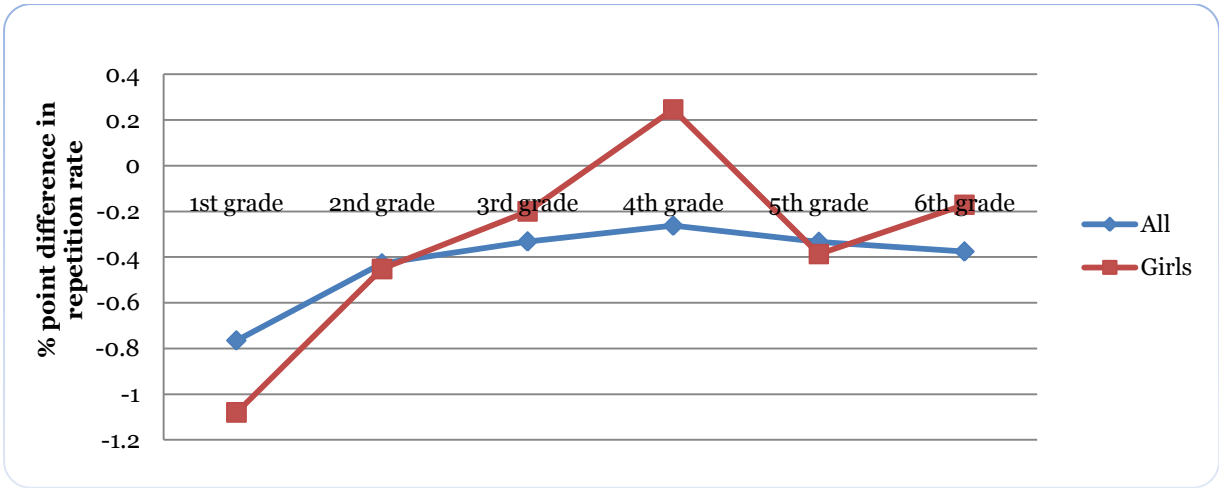
Drop-out

20. School feeding does reduce drop-out, especially for grades two through four where effects were significant – between 1.8% and 2.7%. Girls drop-out follows similar trends, but are only significant in grades four and five, in both cases more marked than the general tendency. This is an essential indicator, and the result reveals that school feeding positively influences pupils' and parents' willingness (and capacity) to stay in school.

Difference in Drop-Out Rates for Boys and Girls Grades 1-6 (Targeted vs. Non-targeted schools)
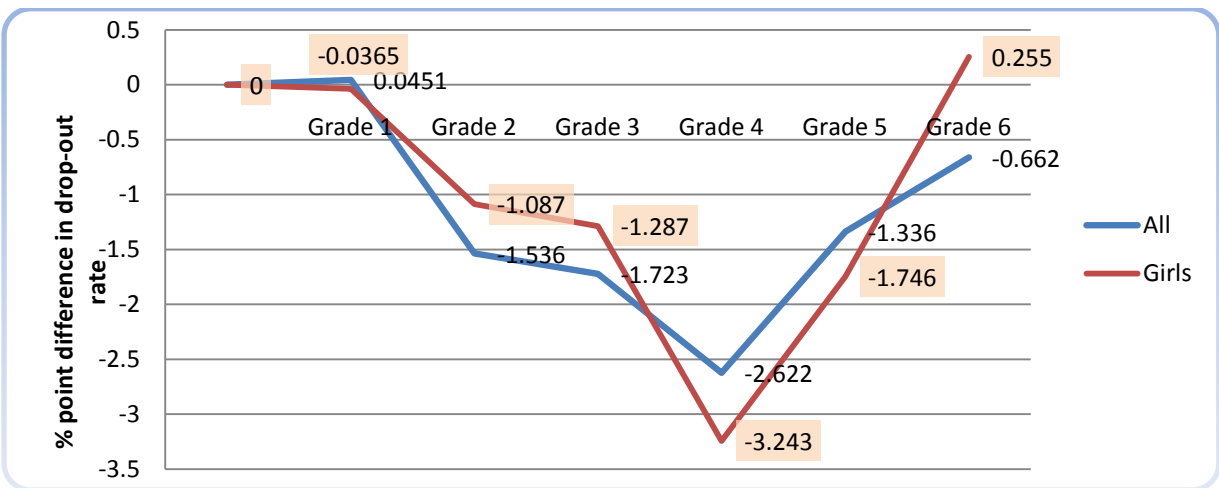
Improved Learning

21. Standard performance tests showed minimal, but non-significant, benefits for targeted schools (a 0.16 score in favour of targeted schools). Possible explanations to these minimal effects across the different strata are attributable to contextual schooling factors. Interestingly though was the marked effect among girl student's math tests in Siem Reap, where there was a significant effect.

Nutrition

22. The school meal in Cambodia provides 593 kcal/person/school-day, and based on current evidence, this is an adequate ration size to support enhanced nutrition and child health.

Anthropometry – Child health

23. According to anthropometric data, the population means for all the groups of schoolchildren are well below the expected averages of a well nourished population. The poorest index is the Height/Age, which is used to measure stunting or chronic undernutrition.

24. The survey data shows significant anthropometric effects on girls, whereas there were no measured effects on boys. Girls benefitting from the SMP are heavier than girls who are not by approximately 1 kg. This is statistically significant evidence of a positive impact on girls' weight. There was also evidence, though less marked, for increased height of girls in the SMP, by up to 1.56 cm. No significant effect on girls Mid-upper-arm-circumference (MUAC) was seen. The boys' results are less encouraging, with no effects on height, weight or MUAC. There is no clear explanation for this difference and the result warrants further analysis, but it suggests that the meal enables girls to take advantage of the natural pre-pubertal growth spurt. The evaluation found no sign of significant results for child growth from the THR. The reason for such appears to be that these rations are shared among family members and thus have less effect than daily meals provided at the schools.

25. Interestingly, the evaluation showed an important, positive, synergistic interaction with girls in the SMP and household sanitary conditions. In concrete terms, this correlation leads to a height advantage of up to 1.8cm among female SMP beneficiaries. This finding is coherent with body of knowledge and supports healthy school approaches, such as the child-friendly school concept implemented in Cambodia, as an appropriate means to improve health among pupils.

26. The School Feeding Programme also shows a positive effect on reducing morbidity among pupils. In the household survey, families were asked how many days their child had been absent from school due to illness in the past two weeks. There is good evidence that both the SMP and THR lead to a reported reduction in absence from school due to illness in girls but not in boys. Reported morbidity was lowest where THR and SMP were combined, followed by SMP and THR.

Micronutrient Status

27. Using World Health Organization (WHO) criteria, the mean haemoglobin levels and the prevalence rates of anaemia showed that there is no significant effect of SMP on the haemoglobin levels of pupils. Given the SMP food basket (with no iron fortified commodities) no impact on haemoglobin levels or anaemia status would be expected. There is some evidence that girls in the poorest asset class have lower haemoglobin (0.40g/dl) than those in the higher asset class.

28. Vitamin A deficiency was investigated using the proxy indicator of reported night blindness. Again, the proportion reporting night blindness was lowest in the SMP+THR group at 5.3%, followed by 5.5% in the SMP group. However, it was high in the THR group at 7%. The percentage in the control was 7.2%. Although these differences are statistically insignificant, they do suggest an improved vitamin A status for those benefitting from the SMP modality.

Improved Calorie and Protein Intake

29. Data analysis from the household survey has shown that the SMP has a robust and significant association with the *individual dietary diversity score* (IDDS) -- a proxy for nutritional adequacy. This holds true across gender, provinces and wealth groups using a

number of regression analysis models. As expected, the THR has no significant effect on the IDDS of boys or girls.

Value Transfer

30. The evaluation analyses to what extent the two different modalities of the WFP School Feeding Programme in Cambodia (SMP and THR) represent a value that have significant outcomes at households level, particularly in terms of income generation, wealth status, food security and physical protection. If the value transfer is of sufficient value, the assumption is that it can serve as, or contribute to, social safety nets, hence potentially mitigating negative effects stemming from poverty or natural disasters on vulnerable and poor households.

31. The evaluation divided households into different categories (classes) in order to differentiate effects accordingly. In terms of value transfer, the household survey documented that the THR represents a higher proportion of household income than the meal provided at the school. This result was expected since THR beneficiaries are selected among poor and poorest households (asset classes) in the community. The THR beneficiary families generally have lower incomes than SMP beneficiaries. The survey demonstrated that THR represents up to 26% of household income for lowest asset classes and 14% for the same class among SMP beneficiaries.

32. The survey and interviews also demonstrated that school meals have an effect on time saved among beneficiary families, especially women. Because children eat at schools, and are like to attend more regularly, less time is spent on preparing meals and looking after children. While the assumption is that time saved may be spend on income generating activities, the survey did not identify any effects in terms of extra income among beneficiary households.

Food security

33. As for food security, the household survey showed that beneficiaries will be more resilient to food shortages during the lean period. This is particularly the case for THR, where poor families extend the period during which they do not have to buy rice, hence decreasing their vulnerability or increasing options for investing in assets. It was also found that, thanks to THR, beneficiaries are able to enrich their diet with fish, vegetables or eggs during the days that they remain on THR rice in the lean season.

How does School Feeding create impact?

The Role of Contextual Factors (Outside WFP's Control)

Education

34. The school feeding interventions are based on causality in which input, output, outcome and impact levels are logically connected. However, certain factors hinder effects from being more marked. Poverty and vulnerability, the need for extra household income affects the attendance of children once they are considered old enough to take on labour activities; low education among parents, most have minimal levels of education (one-three years); low quality of education due to poor teacher preparation, teacher absenteeism as well as access factors such as insufficient schools offering all nine primary grades and inadequate and healthy infrastructures and school conditions. Interviews confirmed that pupils repeated grades either because of difficulties in understanding the subject matter or long periods of absenteeism.

Nutrition and food security

35. Despite of the high levels of national level food production and good economic growth, food insecurity remains. The main causes are lack of opportunities, the vulnerability towards natural disasters and economic shocks (fuel and food prices). At the individual level, poor households struggle with access to food and inappropriate sanitary conditions that affect child health and contributes to chronic undernutrition. Both WHO and UNICEF have reported high levels of haemoglobinopathies (genetic anaemias) within the Cambodian population, which may also be a hindering factor.

Value Transfer

36. The evaluation identified three external factors that influence the extent to which school feeding may produce outcomes in terms of income generation, asset creation and households' capacity to cope with threats. Firstly; assets are guarantees for accessing private credit, which is the most common mechanism to acquire assets in rural Cambodia; poor households are normally characterised by the few assets they possess and thus have limited opportunities to access credits and are less likely to increase their income through assets.

37. Secondly; low levels of education tend to impede poor families from getting out of poverty, which also means that they remain vulnerable and prone to adapt negative coping mechanisms. Thirdly; the characteristics and magnitude of threats households are faced with, be that from natural disasters or idiosyncratic shocks, also affects household vulnerability. The type of threat, as well as their recurrence, determines the degree to which school feeding may serve as safety net.

The Role of Implementing Factors (Within WFP's Control)

38. Successful school feeding programmes are based on high community involvement (contribution and control) and explicit government commitment (strategic and financial). While the Cambodia School Feeding Programme is well functioning and organised, the following factors could be addressed by WFP in order for interventions to become even more effective and sustainable: design (i.e. input, purposes and objectives), community involvement and government ownership and commitment, combined with strategic capacity development.

39. Partnership with UNICEF in implementing Child Friendly School (which are similar to the Essential Package) are normally considered to be an enabling factor for improved schooling, a fact supported by a wide body of evidence suggests that. Although there was no marked evidence of effects from Child Friendly School activities, the evaluation team considers that contextual factors have hindered more visible effects to date.

40. A high resolution targeting of beneficiaries, aligned with purpose and objectives, will affect the overall programme effectiveness. The household survey indicated that targeting may be further refined in order to better include the poorest and most vulnerable groups. Evidence suggests that food assistance amongst these groups is more effective, and also when it comes to value transfer. WFP has considerably improved targeting and geographical concentration over the years. Ultimately, the choice of modality also influences the level of targeting and focus on those most in need.

41. As for nutrition, the evaluation assessed levels of haemoglobin and found that low levels are usually caused by a lack of iron in the diet. WFP Cambodia is currently testing two different types of iron fortified rice for acceptability of use/taste and if successful, the introduction of fortified rice to the food basket could contribute to a reduction of iron deficiency anaemia.

The Interaction between Factors

42. As mentioned earlier, the School Feeding Policy is built upon a logical basis and the programme in Cambodia follows the same approach. The causal relations between input, output, outcome and impact levels very much depends on contextual factors as well as implementing factors. School feeding programmes, unlike conditional cash transfer programmes, depend on other contextual factors in order to reach its objectives. Providing a meal alone does not automatically lead to expected outcomes and impacts, and this was the case for all three aspects evaluated.

43. Impact depends on the type of input envisioned for the specific programme, i.e. food rations size, its content, its relative value and its timely delivery. In terms of causality, contextual factors influence, and to a large degree determine, how effectual inputs may lead to expected outcomes and impacts. Interestingly, this is particularly the case in education, where nutrition and value transfer seems to be less influenced by contextual factors when inputs are rightfully planned for according to purpose.

44. The evaluation provides evidence that SMP and THR ration modalities produce different results within education, nutrition and value transfer. It is, therefore, important for WFP to define the priority purpose of the SFP. This is illustrated by the following examples:

    a) SMP and THR has the same effect on enrolment but not on attendance;

    b) A combination of both SMP and THR seems to have an effect on girls' math performance, but following the marked effects among THR beneficiaries, this modality may have attributed more significantly.

    c) THR does not contribute to same nutritional results as SMP;

    d) SMP has effects on health of girls and reduces morbidity, yet there were no evidence suggesting that THR did;

    e) SMP promotes higher dietary diversity than THR

    f) THR have more effect on value transfer than SMP;

    g) THR has more effect on food security and households' coping mechanisms than SMP.

45. While all activities under the two modalities are within the policy log frame of WFP's school feeding, the evaluation was not able to track clear interlinkages that demonstrate causalities between one area and the other. In other words, causality between improved child-health, understood as a nutritional impact, did not lead to marked effects on learning outcomes, although students are absent less frequently due to illness (improved morbidity through SMP). Contextual factors may contribute to a neutralisation of more marked effects and clearer causality between areas.

46. Improved food security through the THR modality could not be linked to educational outcomes, at least not within the timeframe of the evaluation, but longitudinal studies may shed more light on eventual causalities. Nonetheless, it can be safely assumed that improved food security, and the possibility of investing more in assets, will have an impact on children's schooling as opportunity costs may outweigh the short-term benefit of taking the children out of school. The same is true for improved health; it will most likely contribute to improved education performance.

47. In the Cambodian case, THR is, on the one hand, an adequate tool to target specifically vulnerable populations, as it has potential to function as a social safety net mechanism. It is

also effective as incentive for poor families to keep children, especially girls, in school. On the other hand, SMP is a modality that serves nutritional purposes and raises enrolment figures in targeted areas. Nonetheless, both cases underline the need to define the purpose of intervention and identifying the most appropriate modality. Both modalities work and may produce more marked effects and impacts, but each in their own way.

Conclusions and recommendations

48. The School Feeding Programme is aligned to the government education goals and national strategy framework and in the past 10 years, it was effective in its aim to support primary education by contributing to increased enrolment, attendance and promotion and to reduced drop-out. The SFP has also marked effect on nutrition and value transfer to households. Notwithstanding, the school feeding modalities of SMP and THR affect education, nutrition and value transfer differently. **Recommendation 1:** *WFP Cambodia should consider the differentiated effects of modalities in future programming.*

49. The National Social Protection Strategy is the most appropriate framework for future school feeding operations in Cambodia and THR is the preferred approach as it targets those most in need and is simultaneously more effective as social protection scheme by representing a higher value for beneficiaries than SMP. **Recommendation 2***: It is recommended that a higher proportion of WFP Cambodia resources be dedicated to THR.*

50. SMP is an incentive for families to enrol their children, and the modality has a stronger effect on nutrition than THR but is less targeted to poorest households, meaning that it is not ideal in terms of value transfer (in the Cambodian context). As opposed to a specific targeting of vulnerable groups, SMP is geared toward large-scale programmes and, as such, it is an important complement to sector-wide efforts aimed at increasing enrolment (and attendance). Government commitment is key for such programmes to work on a more sector-wide basis. **Recommendation 3***: It is recommended that WFP Cambodia focuses its involvement in SMP on supporting the development of a sustainable nationally owned SMP. The core of WFP's involvement would be in supporting the development of capacities within national institutions and developing a sustainable procurement modality. Based on current experience, WFP and the Ministry of Education should identify a pilot modality for later roll-out.*

51. The positive effect of SFP could be significantly increased through mutually reinforcing partnerships with agencies dealing with improving quality of education. **Recommendation 4:** *It is recommended that future interventions be part of comprehensive packages, and the collaboration with UNICEF should be enhanced to include other partners as well.*

52. Schoolchildren in Cambodia suffer from high levels of chronic undernutrition, underweight and anaemia which will contribute noticeably to child health, economic productivity and the MMR. **Recommendation 5:** *It is recommended that WFP Cambodia continues its participation in multi-sectoral initiatives, such as the technical working groups, which are required to combat childhood undernutrition that is both efficacious and cost-effective.*

53. Tackling childhood undernutrition is a vital priority in Cambodia, and different ways of doing so need to be explored. The use of fortified rice within the SFP could be a useful contribution to this if it can be demonstrated that it is efficacious in both sexes in reducing the prevalence of iron deficiency anaemia. WFP school feeding policy highlights that WFP will ensure that school meals are nutritious, fortifying them where needed.

Recommendation 6: *It is recommended that WFP Cambodia carefully studies, designs and implements fortified School Feeding food distribution.*

54. A higher resolution on targeting with focus on household level vulnerability criteria will increase effects and impacts of the THR modality, especially with regards to value transfers and retention of children from poorer families. **Recommendation 7:** *It is recommended that targeting be improved in order to better ensure that most vulnerable populations are targeted.*

55. Current school feeding monitoring measures change over time on key indicators, but does not compare with non-treatment areas. In order to improve monitoring, prospective analysis must be improved and the use of smaller control groups operationalised as part of WPF's regular monitoring. **Recommendation 8:** *It is recommended that WFP use control groups and longitudinal indicators for future monitoring purposes in order to strengthen results based programming and enhance evidence of interventions in all three areas of education, nutrition (including anaemia) and value transfer as contemplated in the school feeding policy.*

Full Report

1. Introduction

1A. Evaluation Design

1.   The Cambodia School Feeding Impact Evaluation is part of a series of evaluations commissioned by WFP's Office of Evaluation[3]. The purpose of the Cambodia evaluation is to provide evidence as to whether or not school feeding programmes deliver expected results and if these results make a difference at the sectoral level.

2.   Evaluation results will be used internally to craft eventual course adjustments within the programme and to provide accountability measures for WFP's external stakeholders and partners. The intended users of this particular evaluation are WFP staff worldwide and more specifically, the Cambodia Country Office (CO) where the evaluation findings and recommendations will inform the office's formulation of a new five-year country programme. At the headquarter level, the evaluation targets policy units, the school feeding unit, the Office of Evaluation and executive board members, as well as other units with stake in school feeding programmes, including nutrition and safety nets. Outside WFP, additional parties with interest are WFP donors, UN-partners, NGOs as well as the general public for purposes of accountability.

3.   The impact evaluation responds to specific objectives outlined in the TOR. See Annex A for the complete TOR. Objectives of the impact evaluation are:

   a.   To evaluate the outcomes and impact achieved so far from the various modalities that have been used in relation to stated educational and gender objectives;

   b.   To evaluate outcomes and impact achieved in relation to WFP's new social safety net policy objectives (although these were not explicitly included in the programme design) and to assess the extent to which the programme has met, or has the potential to meet, these; and

   c.   To identify changes needed to enable fulfilment of potential to contribute optimally to Cambodian objectives and the objectives of the current WFP Strategic Plan and 2009 school feeding policy.

4.   The subject of evaluation is the PRROs in which school feeding has been part since 2001 (see part 1C). All of these operations were designed before WFP's executive board approved the organisation's school feeding policy in 2009. This implies that WFP-supported school feeding interventions carried out under the Cambodian PRROs do not necessarily correspond to the log frame of the SPF. Consequently, the CO in Cambodia is not held accountable for activities that are not designed or formulated in coherence with the school feeding policy.

5.   In accordance to the school feeding policy, the evaluation focuses on three main areas: education, nutrition and value transfer. With regards to education, the main focus is on school level outcomes in terms of enrolment, attendance, promotion, repetition and effects on learning outcomes. Statistical analysis and surveys, combined with interview data, are main sources of information used to establish the counterfactual. Additionally, the evaluation seeks to discover if any impact can be attributed to school feeding interventions in the areas of nutrition and value transfer.

6.   The nutritional impact indicators from the SFP log frame were used to guide this aspect of the evaluation. As such, the indicators used to measure impact are enhanced nutrition, child health and decreased morbidity. The primary measure of impact is the anthropometric measurements, which are traditionally used as an indicator of population and child health. In general terms the negative impacts of undernutrition, including short height, are believed

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[3] Together with Cambodia, impact evaluations are carried out in Bangladesh, Cote d'Ivoire, Gambia and Kenya.

to be reversible up to two years of age. However, the prevalence of stunting increases throughout childhood as continued poor nutrition continues to affect height. Children cannot grow if they do not consume an adequate diet. School feeding as an intervention, offers the opportunity to complement and improve the diet of children and prevent any further debilitating growth failure. Haemoglobin, dietary diversity and morbidity are also explored.

7. Impact assessment at the household level (value transfer) is based on the following indicators: value of the food transferred to household, change in the income and food security, using household Food Insecurity Access Scale[4], asset index as well as the use of the extra time available when children attend school.

8. According to WFP, impact implies depth (making a significant difference in someone's life) and breadth (affecting a large number of lives in absolute and/or proportional terms) and has a temporal aspect (i.e. effects that last, which may only be observed over the long term in some instances[5]). In the TOR, WFP defines impact as having:

> *"Lasting and/or significant effects of the intervention – social, economic, environmental or technical – on individuals, gender and age-groups, households, communities and institutions."*

9. Impact evaluations are widely recognized to be methodologically challenging processes, the main reason being that impact, understood as the result or effect derived from a determinate intervention (input), is more challenging to 'trace' than measurements whose effects are closer to the input. Interventions being evaluated are often affected or 'contaminated' by other activities and attributing impact to a singular intervention, therefore, becomes a key challenge for impact evaluations. WFP is aware of the attribution challenge and considers solid evidence of how interventions have contributed to "lasting" or "significant" changes a significant step forward in terms of evaluating impacts of interventions[6].

10. The evaluation applies a mixed methods approach in which the combined approaches of data and information gathering complement each other. The approaches are: (i) a desk review of existing literature, (ii) stakeholder interviews and participatory focus group discussions, (iii) surveys (school and household) and (iv) an analysis of secondary data sources. In combining these four approaches, the evaluation identifies current trends in the Cambodian education system and generates comparisons between targeted and non-targeted schools at the national level (approach iii and iv). Stakeholder interviews provide insight into how to interpret trends within the system as well as the role of school feeding or contribution and focus group discussions (and some stakeholder interviews) bring the evaluation closer to an understanding of the links between school feeding, the individual beneficiary and the education system (approach ii). The desk review provides an overview of WFP's relevant policy framework, supported interventions in Cambodia; alignment and coherence with national strategies and policies. It also relates interventions to findings from other studies carried out at the global level (approach i).

11. Consultations were done within the pre-identified strata of schools; these strata correspond to different components of the SFP (THRs and SMP) as well as non-targeted schools and schools with child-friendly activities. The review phase identified 11 strata; five in Prey Veng Province and six in Siem Reap Province. The two provinces were selected based on criteria regarding vulnerability, poverty, school enrolment and performance data, WFP activities and the presence of child-friendly school activities. Across these strata, 108 schools were identified, of which 30 were control schools. At each school, a number of pupils were randomly identified, typically between 15 and 20 and the household survey was carried out in their homes. In total, 2,014 household surveys were carried out as part of the impact

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[4] The indicator substitutes the food consumption indicator used in other school feeding impact evaluations.
[5] Impact Evaluations of School Feeding 2010-11 - Concept Note (WFP 2010).
[6] Ibid

evaluation. The school survey was designed within the same strata and included 53 schools and 1,227 standardised tests among sixth grade students. Interviews and focus group discussions were carried out with key stakeholders, including international partners, government institutions and WFP CO staff. Focus group interviews targeted beneficiaries (children and parents), teachers, school-committee members and school directors. The survey results are representative of two provinces only.

12. Survey data and data from Ministry of Education's EMIS system were both analysed using econometric analysis. In the econometric analysis of the data three approaches have been used: panel data, standard cross-section regression and matching. In the analysis of the MoESY data we have taken advantage of the time structure in the data to analyze year-to-year changes using standard panel data methods. The household survey data on the other hand does not contain any information from before the school feeding programme was initiated and therefore comparison was made to a control group. Due to the impossibility of choosing, *a priori*, a control group with the same characteristics as the beneficiary schools, two methods were used to control for heterogeneity between the two groups: (a) regression with different sets of explanatory variables and (b) matching. The regression approach uses explanatory variables (e.g. socioeconomic variables) to control for intervention/control group heterogeneity. The matching models consist of two steps: first we calculate the probability that a child is a beneficiary given its characteristics. This is referred to as the propensity score. Secondly, we "match" each beneficiary child with the non-beneficiary child that has the closest propensity score. In this way each child from the treatment group is compared with the most similar child from the control group, which ideally will remove any bias due to heterogeneity between the two groups.

13. The propensity score was calculated using the full set of available explanatory variables (referred to as ExVar in the methodology annex) and the squares of these variables, whenever possible, to capture go some way towards capturing non-linear effects. Thus, the propensity score approach constructs a socioeconomic profile of all the children based on the information from the survey and uses this to match them (See the Methodology Annex E for a more detailed description of this)

Limitations

14. Impact evaluations are challenging, per se, due to the rigorous approaches they require in order for evaluators to be able to determine how and why certain interventions have contributed/attributed to certain results. The evaluation team is, nonetheless, confident that the evaluation processes have been carried out with rigor. However, during the evaluation, some limitations were encountered:

a. There was no baseline data or other longitudinal information upon which data could be compared. This prevented the team from evaluating change over time which would have been useful information in all aspects of evaluation[7], but particularly assessments related to value transfers (income generation). The lack of baseline data is not uncommon for evaluations, and in order to mitigate this data gap, the team used control groups to determine the counterfactual.

b. Another challenge was the identification of a control group for THR beneficiaries. The reason being that THR beneficiaries are selected without reference to pre-defined cut-off points. The selection process is participatory and implicates local authorities, school

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[7] WFP carried out a 'Standardised School Feeding Survey' in Cambodia in 2006 (part of a global effort to assess impact of WFP supported school feeding programmes. Another study was carried out in 2007 by WFP CO Cambodia, the so-called 'School Feeding Baseline Survey'. The first study did not use control groups why it was difficult to use the data as baseline information as changes would only be measured against WFP targeted schools, meaning that counterfactuals could not be established. The second study used a mixture of data produced from WFP to establish baseline data and did not use control groups either. The methods used in the second study make comparisons impossible.

directors and teachers, who select the more vulnerable households without using cut-off, except for the still limited use of ID-Poor cards[8].

c. The survey and the evaluation team's field visits were conducted simultaneously. This meant that some results arising from the survey could not be explored further by the evaluation team through in-depth interviews and focus groups discussions.

d. Field visits were not randomly chosen and were 'prepared' in advance with the possibility that certain bias from interviewees should not be discarded. A non-programmed visit to a non-targeted school in Siem Riep revealed another reality (teacher absent and few students) than the one we saw during 'planned' visits.

1B. Context in Cambodia

History and Socio-Economic Data

15. Persecutions, war and resultant displacements in Cambodia's recent history have severely affected the quality of education services. Cambodia gained full independence from France in 1953, but the US offensive in Vietnam in late 60s and early 70s included bombings in eastern parts of Cambodia. The offensive paved the way for a growing support for the Communist Khmer Rouge. In April 1975, the Khmer Rouge took power and attempted a radical restructuring of Cambodian society. Between 1.5 and 2 million Cambodians died from execution, forced hardship, or starvation during the Khmer Rouge regime under Pol Pot. The regime lasted less than four years, until Vietnamese forces invaded the country and toppled the regime in early 1979. However, unrest and suffering continued as Cambodia also had to endure the consequences of Cold War campaigns in South East Asia. Vietnamese occupation and Khmer Rouge guerrilla warfare meant that millions of Cambodians remained displaced and were forced to serve on either of the two fronts. The end of the Cold War in 1989 paved the way for peace in Cambodia, and in 1993, the first democratic elections were held with a massive 90% turn-out. The previous decades, however, disrupted school activities and created the loss of a generation of teachers and educators at all levels. Today, education in Cambodia is characterised by a vast shortage of qualified teachers and deteriorated physical infrastructures.

16. According the National Institute of Statistics (NIS), Cambodia has a population 13.4 million (NIS 2008)[9] of which about 30.1% live below the national poverty line (ADB 2009) – a decrease of 6% from 1997 to 2007, according to the World Bank [10]. Cambodia had steady economic growth, averaging at 7.1% between 1994 and 2004, and peaking at 13.5% in 2005. This economic growth was driven by an expanding tourism sector and a strong clothes manufacturing industry. The economy stalled in 2008, as the economy was affected by the global financial crisis, and for the first time since the mid-1990s, the economy shrunk in 2009 at 1.5%. The 2010 and 2011 estimated gross domestic product (GDP) growth figures, 4.1% and 5.1% respectively, are still far from the double digit growth figures before the financial crisis[11]. The downturn of economic growth maintains Cambodia among the poorest nations in the region; according to United Nations Development Programme (UNDP), Cambodia still ranks only 137th of 182 on the 2009 Human Development Report[12]. GDP per capita stood at $1,802 in 2007, with public expenditure on health at $43/capita. Data on public expenditure on primary education is not available in the HDR. In 2006, Cambodia moved up from a low to medium Human Development Index (HDI) classification.

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[8] Poor families are issued an ID Poor card according to their poverty status. The card means they have access to certain benefits, i.e. free health care.
[9] The CIA World Factbook estimates the number to be 14.7m, whereas the Asian Development Bank refers to 15.0m (2009).
[10] http://data.worldbank.org/country/cambodia (consulted on July 1, 2010)
[11] Estimated growth figures are from Economist Intelligence Unit Country Report Cambodia 2010
[12] In comparison, neighbouring Vietnam is placed 116, Laos 133 and Thailand 87. Only Myanmar (138), Nepal (144), Bangladesh (146), and Timor-Leste (162) ranks lower in the South-East Asian region.

Nonetheless, economic growth in Cambodia has not been equal for all Cambodians and inequalities, as measured by the Gini coefficient, have risen to 0.43 in 2007, from 0.39 in 2004.

Education

17. According to the National Development Plan (2006-2010), the Cambodian Government is committed to ensure equitable access to universal basic education. Another important commitment, in light of the school feeding programme, is to reduce the financial burden of poor students.

18. Although Cambodia has made considerable progress in expanding basic education in recent years, major concerns still remain related to high drop-out and low retention rates and an acute shortage of trained teachers, especially in remote rural areas. Cambodia has a high Net Enrolment Rate (NER) at the primary school level (94.8% 2009/10). The lowest primary enrolment rates are recorded in Rotanak Kiri (84.4%). National primary completion rates are 83.2% with the lowest rates recorded in Modul Kiri (42.8%).

19. Net enrolment in primary schools and in secondary schools, as well as transition rates from primary to secondary levels, have all shown varying degrees of improvement. According to 2009/10 Education Management Information Systems (EMIS) data records, NERs are approaching universal enrolment levels. In a recent WFP survey (2007) it was found that the primary school NER for the districts covered by the WFP SFP was 92.0% in comparison to a nationwide net enrolment figure of 91.3% in 2005/6. A review of the Education Sector Strategic Plan records shows a 93.3% net enrolment in the 2007/8 school year – enrolment in 'remote areas' saw an increase of 4.6% from 2005/6 – 2007/8.

20. The high enrolment rates are contrasted to low efficiency at primary level. While students' promotion rate for Grades 1-6 in the 2006/7 academic year saw an increase of 3.2% to 52.5% (compared to 49.3% in the 2005/6 school year)[13], primary completion rates are still low and far from the international goals set out in the Education for All (Dakar Framework of Action) and the Millennium Development Goals (MDG).

21. High rates of gross enrolment rates are indications of low efficiency (slow progress or high repetition rates) within primary education in Cambodia, but the rate also indicates late school entry. Inefficiency is a disincentive for parents in regards to keeping their children in school as opportunity costs rise. According to the Ministry of Education, Youth and Sports (MoEYS), gross enrolment rates rose sharply by the end of the 90s from around 90% and has 'stabilised' around 120% since 2002/3[14]. "Over-aged" children are a widespread problem in Cambodian schools, and are one factor that can explain why some gross enrolment figures are often above 100%.

Health and Nutrition

22. Food security and nutrition is among the Cambodian Government's key priorities, including improved basic health of food insecure and vulnerable people. The Cambodia Demographic and Health Survey (CDHS 2005) suggest remarkable improvement in the health and nutrition status of the population since 2000. The report shows that the infant IMR declined from 95 to 66 deaths for every 1,000 live births, and under 5 mortality rate (U5MR) declined from 124 to 83 for every 1,000 live births. This represents a decrease of over 30 %. Still, 39.5% of children under five are stunted, 28.8% are underweight and 8.9% are wasted (CAS 2008) and one in every 11 Cambodian children dies before reaching five years of age (2008), and numbers rose for maternal mortality: 470 deaths per 100,000 live births in 2008, from 440 in 2001.

23. Despite the progress made, the health status of the Cambodian people is still among the lowest in South East Asia. This low health status warrants continued multi-sector

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[13] MoEYS 2009, p. 6
[14] MoEYS 2009, p. 7

interventions, addressing nutrition and food security, access to safe water and sanitation and basic health services, including health and nutrition education.

24. The CDHS report states that the nutritional status of children improved between 2000 and 2005. Statistics from 2005 show that 43.2% of children are stunted, 28.2 % are underweight and 8.4 % are wasted, compared to 49.7 % stunted, 45 % underweight and 38.4 % wasted in 2000[15]. In general, children with uneducated mothers, and those living in the poorest households, are most likely to be chronically malnourished. The data also show that stunting is apparent even among children less than six months of age (6 %). Stunting increases with the age of the child. There is very little difference in the level of stunting by gender. The next CDHS is due to be undertaken in 2010.

25. The Cambodian Anthropometric Survey (CAS) 2008 was specifically implemented to determine if the global economic downturn and food price crisis had had a negative effect on the nutritional status of Cambodians. It followed a methodology which allowed for direct comparison to the CDHS 2005 and CDHS 2000, and importantly, this included the recalculation of the CDHS results to use the WHO growth standards introduced in 2006.

26. The CAS determined that the declining trend in the prevalence of undernutrition, both chronic and acute, had stopped. The prevalence of acute undernutrition nationally was 8.9% and chronic undernutrition was 39.5% in 2008. Surprisingly, wealth quintile had little effect on the rates of acute undernutrition, whereas chronic undernutrition, with its average value of 39.5%, varied between 28.6% and 48.1% with increasing levels of poverty. The CAS highlighted the problems faced by the urban poor in Cambodia who had a Global Acute Malnutrition rate of 15.9%, above the WHO emergency level cut-off.

Food Security and Food Consumption

27. The CFSVA 2008 estimated that 11% of the population (1.7 million people) are food insecure (non-lean season) and 12.5% of rural households. In the Tonle Sap and Plains areas, considered the most vulnerable ecological areas, the proportion of food insecure households was estimated in 15.3% and 9.4% respectively. The CFSVA estimated that the number of food insecure individuals could grow from 1.7 million in June 2008 to 2.8 million during the next lean period, an increase of 64%. Furthermore, the International Food Policy Research Institute (IFPRI) 2009 Global Hunger Index ranks Cambodia within the category of "medium vulnerability", but with potential "alarming" consequences of the global financial downturn on poor households[16]. However, Cambodia has been a net exporter of rice since the mid 1990's, indicating that access to food, not national availability, is the limiting factor of food security. The landless poor, including those in urban areas and those with small land plots, tend to be the most vulnerable to food insecurity. Net rice producers were able to benefit from the high food prices of recent years, but the already food insecure suffered[17].

28. Food consumption, especially in rural areas, accounts for about two-thirds of total household expenditures, indicating the subsistence nature of livelihoods. Furthermore, up to 70% of energy intake comes from rice, indicating the limited dietary diversity that is normally consumed[18]. The CAS 2008 showed a poor level of dietary diversity, albeit unchanged since 2005, with an average of 4.6 of 14 food groups being eaten in the prior 24 hours, and this level of dietary restriction predisposes the population to micronutrient deficiencies.

Vulnerability and Social Safety Nets

29. Despite the above-mentioned economic growth and poverty reduction Cambodia has experienced in the last decade, many Cambodian households remain poor. The economic

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[15] Cambodian DHS Survey 2005. Using data based on WHO 2006 growth standards.
[16] IPFRI 2009, p. 18
[17] CDRI The impact of high food prices in Cambodia 2008.
[18] National Institute of Statistics, Ministry of Planning. Summary report: Food Insecurity Assessment in Cambodia, 2003/04 Cambodia Socio-Economic Survey. September 2007

growth has, however, been accompanied by increasing social inequities, especially in the rural areas, and illustrated by a Gini coefficient which rose from 0.39 to 0.43 between 2004 and 2007[19]. Poverty in Cambodia is closely linked to vulnerability, which is the result of a combination of exposure to shocks and the capacity of households to cope with them. Many Cambodian rural households are exposed to common risks of disasters that affect their crops, to idiosyncratic shocks such as the death of the family head or illness of a household member, and have been seriously affected by the 2008 food prices rise crisis. According to Cambodian Demographic and Health Survey (CDRI)[20], between July 2007 and July 2008, food prices increased by 36.8% in Cambodian markets, and rice prices increased by 100%. Up to 88% of Cambodian households reported having faced difficulties in May 2008, up from 76% in May 2007, mainly related to high food prices. According to a CDRI sample including 14 villages, the proportion of villagers who reported not having enough money to buy food or to cover essential expenses went up from 62% to 69% in the same period.

30. Social safety nets target this category of the population which is excluded from the benefit of economic growth, and whose vulnerability prevents them from escaping from poverty. In their review of safety nets in Cambodia, previous to the formulation of a NSPS - currently in process of adoption by the Government of Cambodia), Council for Agricultural and Rural Development (CARD), WFP and the World Bank identified several gaps and challenges faced by safety net interventions. The implementation gaps mentioned are the low coverage of the urban vulnerable population (the urban population is significantly less poor than the rural population, but there are extremely poor pockets of population that still exist); the concentration on food-based interventions, considered to have high logistical costs and eventual negative effects on local markets; the low development of other types of interventions which have proved successfully in other countries (such as cash-based interventions - conditional cash transfers); the lack of appropriate targeting (many ad hoc targeting procedures, and limited geographical coverage), and the lack of monitoring and evaluation of the existing interventions. CARD, WFP and World Bank also identified institutional and financial challenges such as the need to build a long-term vision and not only respond to immediate priorities; the need to improve the coordination of interventions between the Government and its partners and to create a specific government body to promote the coordination between relevant ministries; and finally the low budget allocated to safety net interventions, which are often funded by partners and implemented in parallel to the Government system[21].

31. The objective of the formulation of the NSPS is to fill these gaps. Within a global and long-term vision of social protection, it establishes the priority of developing social safety net interventions to benefit the poorest and more vulnerable Cambodians[22]. The NSPS aims to provide a framework and to support the relevant line ministries in charge of the implementation of social safety net interventions, looking for improved coordination, sustainability, effectiveness and efficiency. It defines objectives in terms of the coverage of basic needs, investment in human capital (nutrition, maternal and health care, education, the struggle against child labour, etc), access to work and income, access to health, and assistance to special vulnerable groups.

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[19] "While poverty rates decreased in both urban and rural areas, inequality and the urban-rural divide increased between 1993-94 and 2007. Less than 1% of the population in Phnom Penh was deemed to be poor in 2007, compared to more than 20% in other urban areas, and almost 35% in rural areas, where approximately 80% of the population lives. While inequality in Phnom Penh has decreased, it has increased in other urban and rural areas" (Cambodia Safety net review; Draft Policy Note; 2009; CARD, WFP and World Bank; p. 13).

[20] CDRI The impact of high food prices in Cambodia 2008.

[21] Cambodia Safety Net Review; 2009; CARD, WFP & World Bank.

[22] "The main goal of the NSPS is that poor and vulnerable Cambodians will be increasingly protected against chronic poverty and hunger, shocks, destitution and social exclusion and benefit from investments in their human capital" (National Social Protection Strategy for the Poor and Vulnerable; CARD, WFP and World Bank; 2010).

Cambodian Development Goals and International Partners

32. The Cambodian Government has a firm commitment to achieving the MDG education goals by 2015. To that end, the MoEYS has defined various priority actions under multi-year strategic frameworks, e.g. the Education Strategic Plan and Education Sector Support Programme (ESP/ESSP) 2006-2010. The three main policy areas concern equal access, quality and institutional and capacity building. While the WFP supported SFP is coherent with the ESP/ESSP's policies, specific mention and strategic consideration of school feeding as a potential contributor to these policies has yet to be reflected in the Education Strategic Plan (ESP).

33. Cambodia hosts major bilateral and multilateral donors, including more than 20 UN agencies, the World Bank, the Asian Development Bank (ADB) and major OECD/DAC donors, such as the USA, the United Kingdom, Germany, Sweden, etc. Multilateral and bilateral combined support for 2009 was estimated to be approximately 910.5 million US$[23]. Coordination and harmonisation efforts in Cambodia have achieved significant progress during the late 90s, and 2007 saw the establishment of the Cambodian Development Cooperation Forum, and mechanisms such as the Joint Monitoring Indicators have been set up to measure joint development efforts. There have been 19 working groups created to provide consultation, collaboration and cooperation at the sectoral level, and they consist of representatives of the Government of Cambodia and its development partners. WFP participates in several TWG, including the Education Sector Working Group, Joint TWG, a working group on HIV in education and a TWG on Food Security and Nutrition, among others.

1C. WFP's Work on School Feeding in Cambodia from 2001 - 2010

34. The evaluation focuses on school feeding operations in Cambodia from January 2001 to June 2010. While the period under analysis includes a total of eight programmes (three development programmes, one emergency operation and one special operation) the impact evaluation only focuses on the following PRROs.

Table 1.   Programmes Evaluated

Project Number	Start Date	End Date	Title
6038.1	Jan 2001	Dec 2003 (extended to Jun 2004)	Food Aid for Recovery and Rehabilitation in Cambodia
10305.0	Jul 2004	Dec 2006	Assisting People in Crisis
10305.1	Jan 2008	Dec 2010	Assisting People in Crisis

Input-outputs PRROs 2001 - 2010

35. The commodities managed under the different PRROs from January 2001 to December 2010 experienced large instability. Total commodities managed under the PRROs decreased from almost 127.000 metric ton (MT) in the years 2003/4 to 79.000 MT in 2007/9 (10305.0 PRRO) – a decrease of almost 38% (28% SMP and 10% THR). The actual distribution in 2007 reached only 16.611 MT, which was 53% less than the planned figure for that year (35.388 MT). Nonetheless, in the same period, there was an increased prioritisation of resources devoted to social sector activities. School feeding's share of WFP activities in 2009 reached 38% (see Graph 1 over leaf).

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[23] According to the Cambodia Development Cooperation Forum, December 2008 (Press release: "*Government and development partners committed to second phase of rectangular strategy*": viewed last time on June 3 at: http://www.cdc-crdb.gov.kh/cdc/first_cdcf/default.htm)

Graph 1.   School Feeding share of Commodities Distributed in 2009
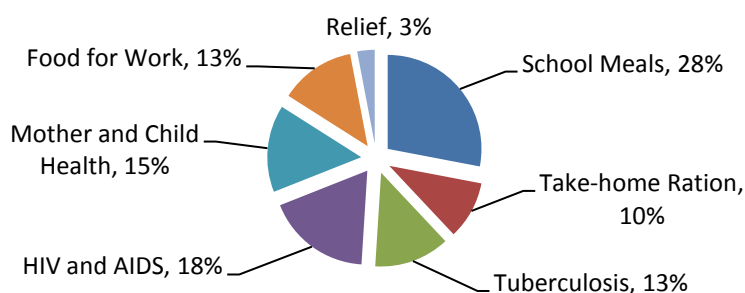
Source: WFP CO Cambodia

36. During the period of the three PRROs, the school feeding programme experienced a considerable increase in numbers of beneficiaries, rising from 291,593 (2002) to more than 610,000 in 2006 and 2007, levelling off at 482,961 in 2009. However, lack of funding (commodities), combined with increased food prices, affected programme implementation from 2007, and the total numbers of food aid beneficiaries in Cambodia decreased 33%. Notwithstanding, school feeding beneficiaries decreased only 19% in 2008 due to the prioritisation of school feeding interventions (see Graph 2 below).

Graph 2.   School Feeding Beneficiaries vs. Planned (2002-2010)
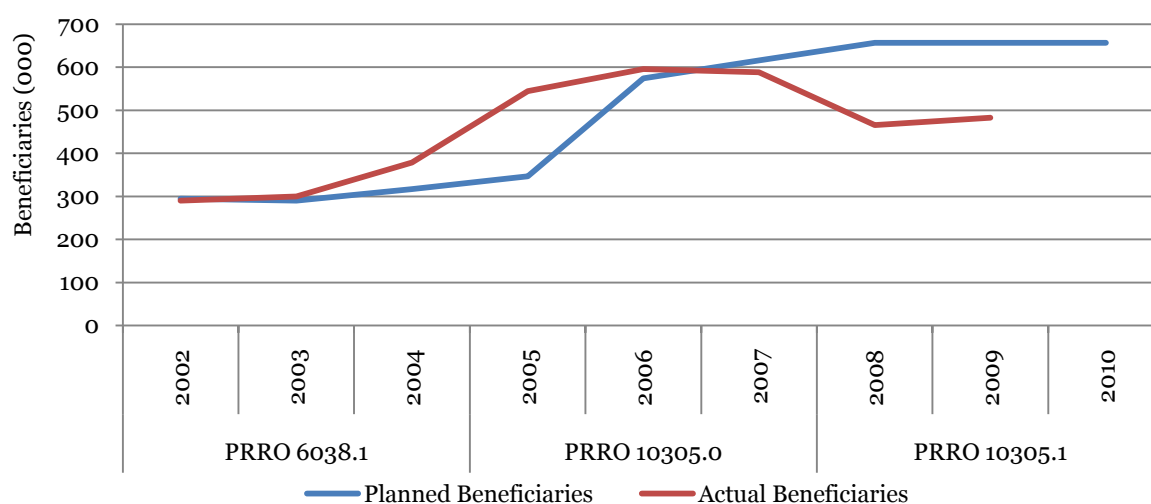
Source: Adaption from: WFP Office of Evaluation, Mixed Method Impact Evaluation of WFP's School Feeding Programmes in Cambodia (2000 -2010) Terms of Reference, 2010, page and 2009 data collected from WFP CO Cambodia.

37. Despite prioritising school feeding under the three PRROs, the reduction of commodities from 2006 and onwards has meant that the actual food delivered to beneficiaries were either diminished in size and quantity (mainly affecting fish, oil and beans) or ceased for shorter or longer periods (e.g. SMP) and THR was not delivered for four months in 2007 and 3 months in 2008 (during this period THR distributions were only disrupted for one month). See Annex G.2 for an overview of pipeline breaks and reductions since 2006.

38. A 2008 WFP sponsored study revealed that the Cambodia SFP had an average cost to WFP of US$ 48,03 per child (THR + SMP) which compares advantageously with the WFP average of US$61 (THR and SMP). Neighbouring Lao People's Democratic Republic had a WFP SFP (THR+SMP) at a cost of US$70,51. A EU review[24] of the country's budget for the primary education sector was of approximately US$ 28 per child enrolled (2009).

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[24] The Education Sector in Cambodia / A Diagnostic Review for ESP I ESSP 2009-13 A review of key technical and strategic issues in the sector (September 2009)

Targeting

39. The targeting of activities under the PRROs being evaluated has changed over time from national coverage (24 provinces) to a focus on more vulnerable areas. The reorientation was initiated in 2005, and on the basis of vulnerability assessment findings, coverage was changed from being countrywide to focusing on the most food insecure communities in 12 provinces. Within these food insecure areas, school feeding activities target schools with lower levels of enrolment and higher drop-out rates. This new targeting coincided with WFP's increased focus on school feeding at the expense of other food aid beneficiaries.

40. The Integrated Food Security and Humanitarian Phase Classification (IPC) study in 2007 further enhanced WFP's targeting on more vulnerable populations. The reorientation of activities under the PRROs in favour of school feeding interventions has meant that the SFP covered a significant 20% of total primary education students in 2009/10. Table 2 (below) shows the SFP coverage for the school year 2009/10 in the 12 targeted provinces.

Table 2.   MoEYS schools vs. WFP supported schools in targeted provinces (2009-2010)

Province	Total MoEYS primary schools	WFP-assisted schools				
		SMP only	THR only	SMP+THR	Total	%*
Banteay Mean Chey	394	5	145	16	166	42
Kampong Cham	779	24	2	115	141	18
Kampong Chnang	255	3	2	100	105	41
Kampong Speu	305	-	-	107	107	35
Kampong Thom	460	187	-	-	187	41
Odar Mean Chey	159	129	-	-	129	81
Phnom Penh	-	1	-	-	1	-
Preah Vihear	175	13	30	6	49	28
Prey Veng	**563**	**185**	**25**	**17**	**227**	**40**
Pursat	265	4	-	38	42	16
Siem Reap	**463**	**136**	**93**	**153**	**382**	**83**
Stung Treng	103	-	-	30	30	29
Svay Rieng	212	36	-	22	58	27
Total	**4133**	**723**	**297**	**604**	**1624**	**39**

Source: WFP Office of Evaluation, Mixed Method Impact Evaluation of WFP's School Feeding Programmes in Cambodia (2000 -2010) Terms of Reference, 2010, page 7. Highlighted Provinces (Prey Veng and Siem Reap) were included in survey. *Number of WFP assisted schools versus total number of MoEYS schools in targeted provinces. Total number of schools in country is 6,665.

41. The programme is implemented through three modalities: SMP, THR and a combination of both (SMP+THR). The SMP makes up 45% of the total school feeding interventions, THR only 18% and the combined modality 37%. While the SMP targets grades 1-6 to all pupils at the targeted school, the THR is more selective as it only targets pupils from grades 4-6, as these are the most vulnerable in terms of drop-out or irregular attendance. In schools where both modalities are combined, grade 4-6 pupils benefit from two modalities. The age group targeted through the different modalities is between 6 and 11 years in grades 1 to 6.

42. Within the 12 target provinces, districts, and schools, are selected on education performance indicators. There is no individual targeting for SMP, whereas, children are selected on the criteria of poverty for THR. The selection process is participatory, and involves teachers and sometimes children.

Partnerships

43. The number of partners decreased in the period being evaluated, and focus has been put on more strategic partners. Under the approach of national coverage, the number of WFP partners was correspondingly high; in 2005 there were 11 international NGOs and 16 local NGOs. In 2009, the number of partners decreased to five international NGOs and 10 local NGOs. While the number of international and local non-governmental partners has decreased, WFP has placed more focus on collaboration with governmental authorities; from the MoEYS level through to provincial and district education administrations. The purpose of such collaboration is to enhance both national capacity through training of provincial and district staff in school feeding management and ownership of the SFP through direct involvement in management and implementation of the programme (selection of schools, control of commodities and monitoring).

44. In 2006, WFP also strengthened its partnership with UNICEF, and efforts have been made ever since to enhance joint operations under the CFS policy promoted in Cambodia by UNICEF and adapted by the MoEYS. The CFS contemplates activities outlined under the enhanced UNICEF-WFP partnership, the so-called Essential Package, which aims at making common school-based activities more effective and cost-efficient, as well as improving outcomes and social equity (see Annex G3. for a short description)[25]. In Cambodia, school feeding and CFS are targeting more than 600 schools.

Strategic Alignment

45. The school feeding activities are aligned with WFP's Strategic Objective (SO) 4 – Reduce Chronic Hunger and Undernutrition[26].

46. School feeding activities under the PRROs are also aligned to WFP's school feeding policy, approved by the Executive Board in November 2009[28]. Although school feeding activities have been implemented for more than a decade in Cambodia, thus prior to the approval of the school feeding policy, input and output are aligned with the policy in terms food rations, deworming, advice to the Government, local procurement, essential package activities and school infrastructure (access roads under food for work-schemes and improved kitchen facilities[29]).

47. At the national level, the SFP is aligned with the Government of Cambodia's efforts to eradicate poverty and food insecurity. School feeding as an incentive-based intervention was included in MoEYS's 2006-2010 ESP, where it was referred to as incentive with regards to reducing drop-out and improving progression in primary schools, as well as a merit-driven programme for youth from poor families[30]. WFP has recently played an active role in assisting the Government of Cambodian Government in formulating the NSPS (see paragraphs 28 and 29).

Cambodia School Feeding Intervention Logic and Policy Log Frame

48. The impact evaluation assesses outcomes and impacts of school feeding interventions in Cambodia since 2001 and the school feeding policy. In order to assess impacts at these two levels, the evaluation team refers to the school feeding policy's intervention logic – or programme logic – in order to analyse causalities between interventions (input – output) and expected outcomes and impacts. The programme's intervention logic is held together with the school feeding policy log frame, as impact assessments refers to both of these 'log frames' (see also Part 1.A) It should be noted that the PRROs did not include specific nutrition and value transfer objectives. The graph below outlines the main features of the school feeding policy that has been evaluated (highlighted areas).

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[25] The evaluation included CFS activities in this evaluation in order to identify eventual impacts or added values when SMP is carried out in CFS schools.
[26] Under the Programme Category Review WFP/EB.A/2010/11/ Rev.1 (June 2010), PRROs will be designed in support to SO1 and SO3 while CP or DEV will be designed in support to SO4.
[28] See World Food Programme (2009), *School Feeding Policy*, Rome, Italy.
[29] Fuel efficient stoves have been built at schools in partnerships with TNT and NGOs.
[30] See MoEYS 'Education Strategic Plan 2006-2010', pp. 12 and 25.

Graph 3.   Analytical Intervention Logic: Input - Output

			SAFETY NET	
INPUT	**OUTPUT**	**TYPE OF OBJECTIVES**	**OUTCOMES**	**IMPACTS**

INPUT	OUTPUT	TYPE OF OBJECTIVES	OUTCOMES	IMPACTS
MICRO-NUTRIENT FORTIFIED MEALS, SNACKS, TAKE-HOME RATIONS WITH DE-WORMING	**NUMBER OF CHILDREN FED, RATIONS AND DE-WORMING TABLETS DISTRIBUTED, SCHOOLS REACHED**	*Nutrition*	Improved micronutrient status of school children *Indicator: Prevalence of iron deficiency anaemia*	Enhanced nutrition and child health, increased learning, decreased morbidity
			Improved calory and protein intake *Indicator: Kcal transferred to schoolchildren*	
		Education	Increased enrolment **Indicator**: *Enrolment: average annual rate of change in number of boys/girls enrolled*	Improved learning
			Increased attendance **Indicator**: *Attendance Rate*	Increased HH human and financial capital
			Increased retention/Decrease in school dropout **Indicator**: *Retention rate/Dropout rate*	Increased lifetime earnings of targeted children
			Improved school achievement *Indicator: Promotion rate*	Increased access to education for girls and OVCs
			Short term hunger alleviated leading to improved child cognition *Indicator: Teachers' perception of children's ability to concentrate and learn in class*	Decrease in maternal and infant mortality rates
			Completion of basic education **Indicator**: *Pass Rate*	Increased awareness on family planning, fewer and healthier children
		Gender	Increased gender equality in education **Indicator**: *Gender ratio: ratio of girls to boys enrolled*	Decreased HIV/AIDS prevalence
				Inter-generational effects - positive influence of more educated parents on children growth
MICRO-NUTRIENT FORTIFIED MEALS, SNACKS, TAKE-HOME RATIONS WITH DE-WORMING	**NUMBER OF HOUSEHOLDS BENEFITING FROM SCHOOL FEEDING**	*Value Transfer*	Increased household income *Indicator: Monetary value of food transferred*	Improved food security
				Increased investments in HH productive assets
				Improved health/nutrition status of non-school going children and other household members
			Improved household food consumption **Indicator**: *Household food consumption score*	Decrease in reliance on negative coping mechanisms
				Decrease in child labour participation
POLICY, PLANNING AND TECHNICAL ADVICE TO GOVERNMENTS	**PROVISION OF CAPACITY DEVELOPMENT ASSISTANCE TO COUNTRY ENTITIES INVOLVED IN SCHOOL FEEDING**	*Capacity Development*	Strenghten government capacity to plan for and implement School Feeding *Indicator: Action plan and milestones to reach the 8 SF quality Standards i) sustainability ii) sound alignment with national policy frameworks; iii) stable funding and budgeting; iv) needs-based, cost-effective programme design; v) strong institutional and implementation arrangements; vi) local production and sourcing vii) strong partnerships and inter-sector coordination; viii) strong community participation and ownership	Improved effectiveness of school feeding policies and programmes to reduce hunger
COMPLE-MENTARY ACTIVITIES	**LOCAL PROCUREMENT**	*School Feeding as a Platform for Complement ary Activities Providing Wider Socio-Economic Benefits*	Increased farmer income and marketing opportunities with local procurement and processing for school feeding *Indicator: Food for school feeding purchased locally, as % of food distributed for school feeding in-country*	Food assistance transformed into a productive investment in local communities - Improved local economies
	ESSENTIAL PACKAGE		Essential Package interventions at school (safe water, fuel-efficient stoves, woodlots) promoted *Indicator: Proportion of schools with assets in place*	Wider socio-economic benefits (reduced fuelwood consumption and carbon footprint, improved school infrastructure, improved education environment)
	SCHOOL INFRASTRUCTURE		School infrastructure (schools, school kitchens, access roads) promoted *Indicator: Proportion of schools with school assets in place*	

Right margin (vertical text): **CYCLE OF HUNGER INTERRUPTED**

* Project specific Indicators not currently appearing in the Strategic Results Framework

2. Results: Outcomes and Impact of School Feeding

2A. Education

49. The results presented in these paragraphs stem from the two types of surveys (household and school) and the interviews carried out during the evaluation mission.

50. The education assessment was done using data from the household and school surveys as well as data from MoEYS. These data sources were combined with interviews with parents, pupils, teachers, education authorities and local communal authorities. A thorough description of the surveys, interviews and methodologies can be found in Annex E. The assessment is based on the following indicators: enrolment, attendance, repetition, promotion and improved learning.

Enrolment

51. There are strong indications that the SFP has had an effect on enrolment, both when it comes to SMP and THR. The evaluation team used various analytical models on the EMIS data to establish the counterfactual between beneficiary schools and control schools (see Annex E). The panel data model includes all primary schools in 2001-2009 and takes into consideration different variables used by MoEYS to account for conditions at schools that may have an effect on enrolment.

52. When applying different analytical models, there is a positive significant effect on enrolment. Panel data analysis estimates an increase in enrolment in the interval between 2-2.5% when a school is incorporated into a SMP[31], with a more marked effect among girls' students of 2.4-3%. A direct comparison between 2002 and 2009 also shows a positive significant effect; schools that were not part of the SFP in 2002, but included in 2009 had an increase in enrolment over the entire period of 6.1% more than schools that were neither included in 2002 nor 2009[32]. Considering the high NERs that have been reached in recent years in Cambodia, the increase generated by school feeding is significant and underlines the effect it has on enrolment.

53. However, the evaluation found that once the school is no longer part of the school feeding programme, attained effects on enrolment diminishes or disappears. The analysis measures effects in 2009 on schools that are no longer part of the programme but at some time in the period from 2002 – 2009 did benefit from school feeding[33], and they did not experience significantly higher increases in enrolment compared to schools which did not participate. There is however a tendency that schools do not get back to enrolment levels as from before the school feeding programme, meaning there is a net effect, despite the registered decrease.

54. The statistical results from the EMIS data coincide with statements expressed by interviewees during the evaluation mission. All interviewees highlighted the effect that school feedings has had on the enrolment of children at community levels; parents, teachers and education authorities confirmed this tendency, making reference to situation before and after introducing school feeding and the effects the programme has as an incentive for parents to send their children to school.

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[31] See methodology section, models FE2-FE4 (FE1 estimate not used since it seems to underestimate effect).
[32] See methodology section, model D1.
[33] See methodology section, model D2.

55. Interviewees highlighted the positive effects that school meals have had on early enrolment. According to interviews, early school meals have meant that parents are more willing to send their children to school at the age of 6-7 years. While this can have the positive effect of reducing children's late entry to primary school, it may also enhance the chances that children have to complete basic education at a younger age. Thus, children become less exposed to drop-outs or irregular attendance that results from parents' dispositions in terms of prioritising domestic labour or salaried jobs over education as a means to increase household income. However, the evaluation has done a regression analysis of data from household surveys in order to confirm this tendency and there were no statistical indications that SMP has an effect on early entry among target groups (see table in Annex G3-A). The evaluation found conflicting results concerning early entry and the effects that school feeding potentially have on early entry merits further investigation.

Attendance

56. Measuring attendance is complicated and requires accurate data from the schools, which is also often a challenge. In Cambodia, regular attendance is only monitored at the school level and not recorded in MoEYS' EMIS. Records are also known to be somewhat biased[34]. In order to add another element to attendance records, the household survey included questions related to children's school attendance[35].

57. In regards to attendance, the household-survey showed that only THR has a significant effect on attendance. In other words, the team was not able to measure significant effects on attendance among SMP beneficiaries. The household survey showed that attendance among THR female is markedly more regular than among other students (see Graph 4 below) and the lowest attendance was recorded among school-meal control strata (though difference with SMP is insignificant). Female attendance is generally higher in all strata and THR seems to have a particular effect on female attendance, hence fulfilling its objectives of incentivising attendance among the group of beneficiaries.

Graph 4.   Attendance by Gender and Strata
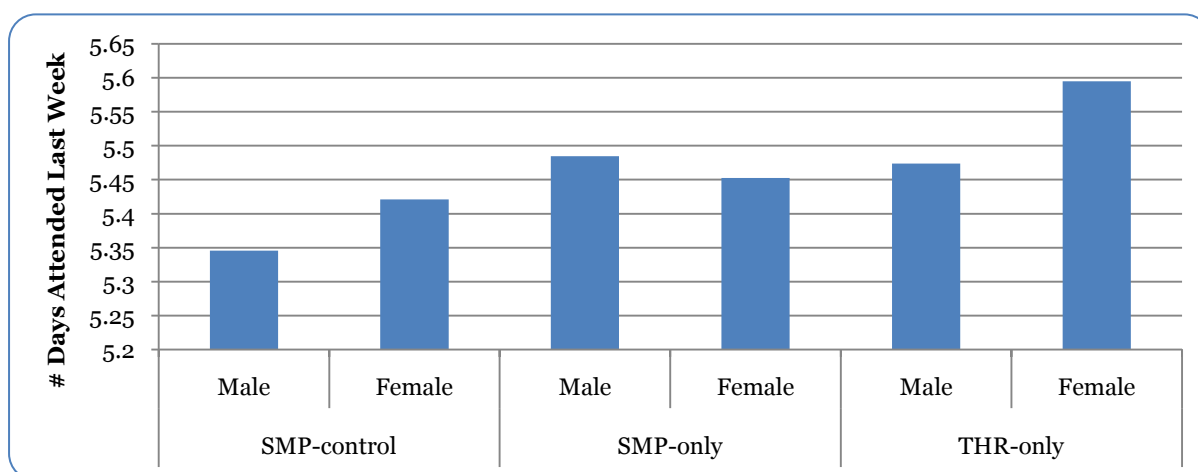
Source: Evaluation team – household-Survey. Number of observations: SMP-Control (652), SMP-only (676), THR-only (399).

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[34] The main challenge using attendance data rests in the fact that this data is based on teachers' daily records. Such records may be inflated as school budgets or other assistance (including food) often depends on attendance records. This will bias the estimates based on MoEYS data upwardly. The analysis of attendance in the household survey has acted as a check on these results.

[35] Head of households were asked about their children's attendance the week before the survey – note that there are six school days per week in Cambodia – the attendance scale is therefore 1-6.

58. According to data from the household-survey, the general tendency of higher attendance among THR beneficiaries can also be presented in terms of days when projecting the five-day recall on a monthly- and yearly scale. The projection gives the following result: on a monthly basis, THR means that attendance increases by 0.5-0.7 day and on a yearly basis, the increase is between approximately 5-6.5 days, corresponding to 2.4 – 3.2 percentage increase (See table 3). While it is important to notice that these data does not take into consideration annual variation, they do demonstrate positive effects at the time of the survey.

Table 3.   Estimated effect of THR on Attendance

	Increase Days			Attendance Increase (%)
	Per week	Per Month	School-year	
Low estimate	0.12	0.5	4.8	2.2%
High estimate	0.16	0.7	6.4	3.0%

Source: Evaluation team – household survey, Highest and lowest estimate from models R2-R4 and ATT

59. A third source for assessing attendance is WFP Cambodia's monitoring system which also found positive effects related to attendance. WFP's monitoring of attendance differs from the survey in the sense that it only measures attendance change over time and does not measure the counterfactual (comparing attendance trends with control schools)[36]. According to WFP Cambodia monitoring, attendance rates for boys and girls in targeted schools increased by almost 9% from the end of the 2007/8 school year to mid-school year 2009/10 (see Graph 5 below). Here the positive effect is clear, but the counterfactual effect cannot be established, nor can the impact of school feeding be established due to the lack of control groups.

Graph 5.   WFP Monitoring Attendance Rates
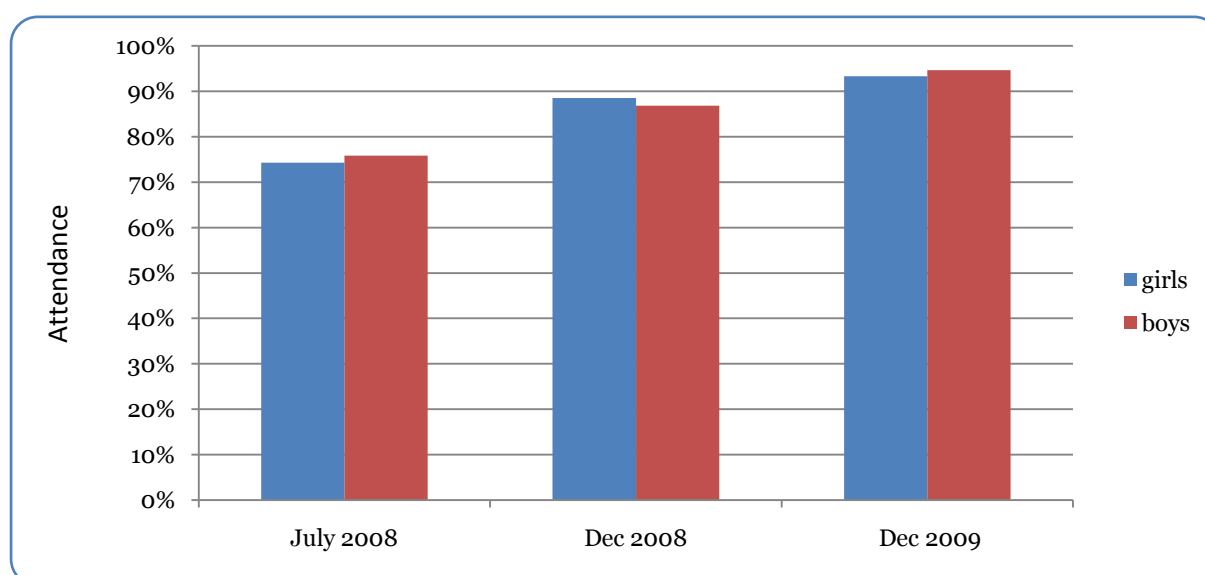
Source: Data: WFP Standard Project Report 2008 and 2009. Graph: Evaluation team.

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[36] WFP collects data from school monitoring and uses head-counts and school records to assess attendance.

60. However, parents and teachers who participated in interviews mentioned that school feeding had an effect on attendance, but with some nuances that are not captured by the survey (i.e. in terms of number of days). The effect highlighted by interviewees can be categorised into three areas: (i) children being more punctual in the mornings, (ii) improved participation and concentration during class as well as (iii) more regular attendance throughout the day. Firstly, the early morning meal has meant that pupils are more punctual and a correlated effect is that they, therefore, would take more advantage of the school day. Secondly, before the introduction of school meals, many parents reported that students, especially younger children who went home in mid-morning breaks to have something to eat, did not come back to school once the break was over. This trend was also an issue that was highlighted during interviews at control schools, but with a negative outcome; children often stayed away after going home at breaks. Thirdly, school meals have the positive effect of pupils being more active in class and able to concentrate for longer periods of time. This tendency was confirmed by all teachers and parents that were interviewed.

61. The interviews and focus discussions also revealed that they are faced with challenges affecting attendance despite the existence of the SFP. According to many interviews, the fact that families' economies do not suffice to maintain all children in school, many parents opt to take children out of school if they can get a job at garment factories, low-paid jobs with other farmers or home-based labour activities. Migration is an alternative income option for many families, having a potential negative effect on attendance. However, there were several examples from the interviews indicating that, because of school feeding, parents were more willing to let the children stay with relatives during periods in which they would normally migrate abroad or to other provinces due to labour opportunities. Interviews among control groups confirmed the opposite tendency; children were taken out of school when parents migrated.

Promotion and Repetition[37]

62. Promotion is one of the outcome indicators of WFP's school feeding policy and refers to how students progress from one grade to the next. The assumption is that more regular attendance and increased performance among pupils would also lead to higher promotion rates. There is no automatic promotion in Cambodia and pupils' promotion is determined by final exams at the end of the school year. All decisions concerning promotion are taken by teachers at the school level and there are no centralised systematisations of final exam results.

63. In order to measure the effect on promotion rates, the evaluation team set up a panel data model using a set of variables that are based on MoEYS' EMIS-data. The model compares trends over a defined period of time from 2001 to 2009 in order to identify the counterfactual between beneficiary schools and control schools, meaning that the vertical axis represents the difference between target and control schools.

64. The outcome of the analysis reveals that the SFP has an effect on promotion rates; but that this effect is only significant in grade four (see Graph 6)[38]. The graph illustrates percent point change once a school is being targeted by the SFP[39]. While there is a positive trend in all grades, there are no clear explanations as to why effects are only significant in grade four.

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[37] WFP refers to retention and drop-out rates as indicators of eventual effects from school feeding programmes. In this analysis, both indicators will refer to promotion repetition as 'proxy indicators' for retention and drop-out
[38] See analysis FE4, Annex E
[39] See analysis FE4, Annex E

Graph 6.   Difference in Promotion Rates (Targeted vs. Non-targeted schools)
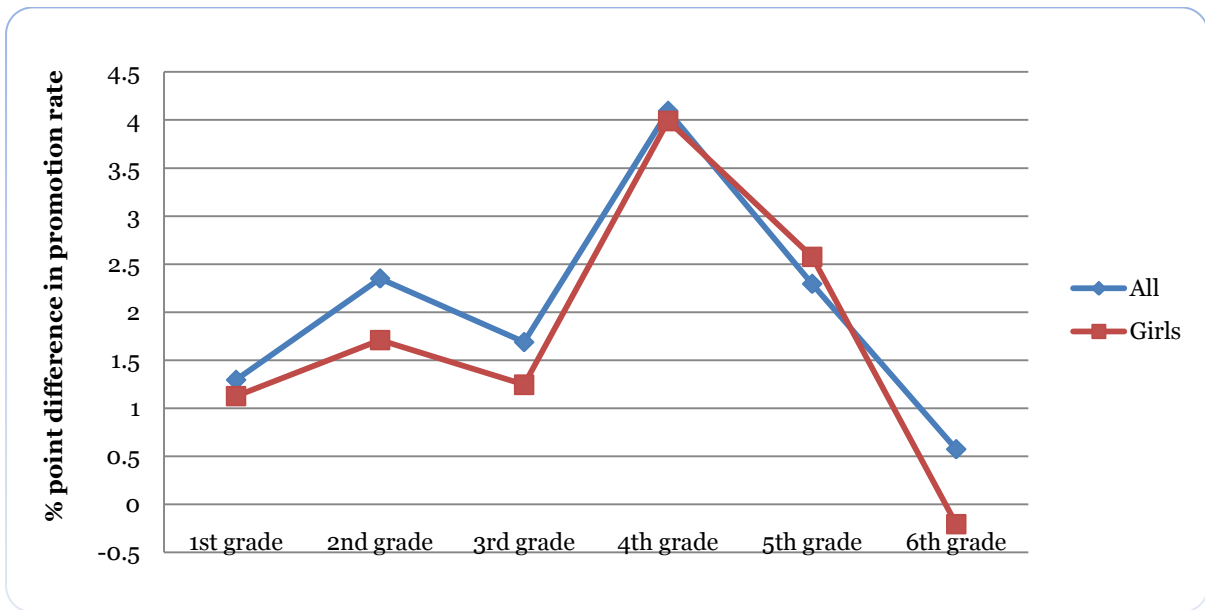
Source: Evaluation Team – household Survey. Model FE4. N=35962.

Graph 7.   Difference in Repetition Rates (Targeted vs. Non-targeted schools)
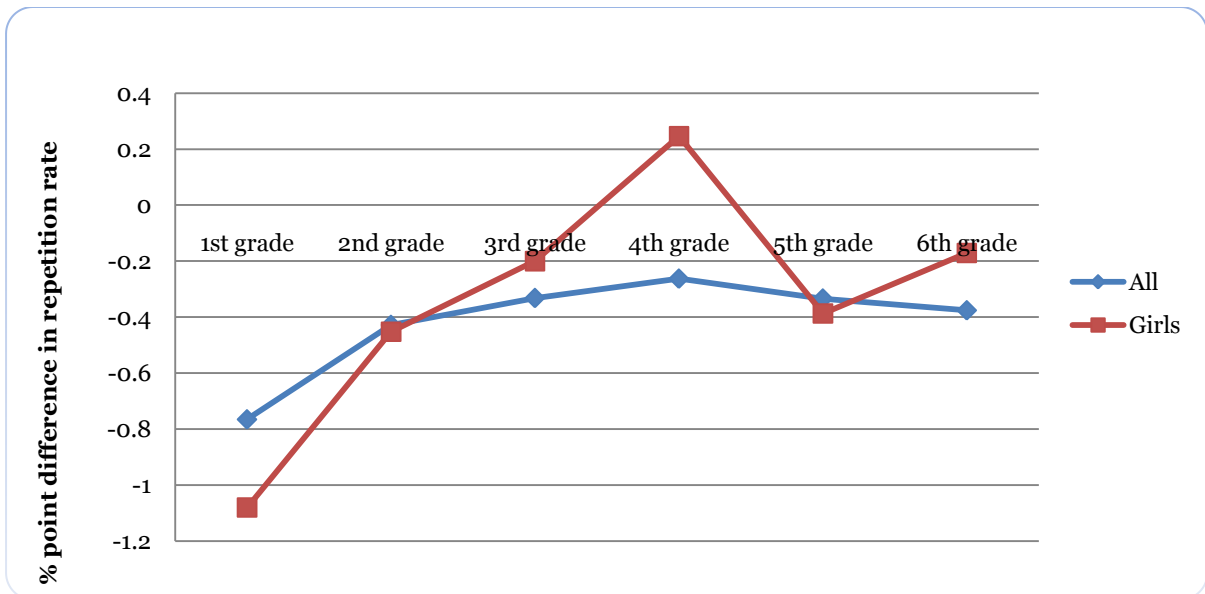
Source: Evaluation Team – Household Survey. Model FE4. N=35962.

65. In terms of repetition rates (Graph 7), the panel data analysis again indicates that the SFP lowers repetition grades but the result is only significant in one (Grade 1) out of six grades[40], with the effects among girls more significant.

66. Questions related to repetitions were included in the household-survey. Results from the survey reveal that THR generally has a more positive effect on repetition than school meals, which may be a result of the effect THR has on attendance. As for SMP, the tendency is less clear as the repetition rates quite clearly follow the control group, with exception of 17 and 18-year-old students.

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[40] see Annex E models FE1-FE4 for detailed analysis results

Graph 8.   Number of Grades Repeated by Age
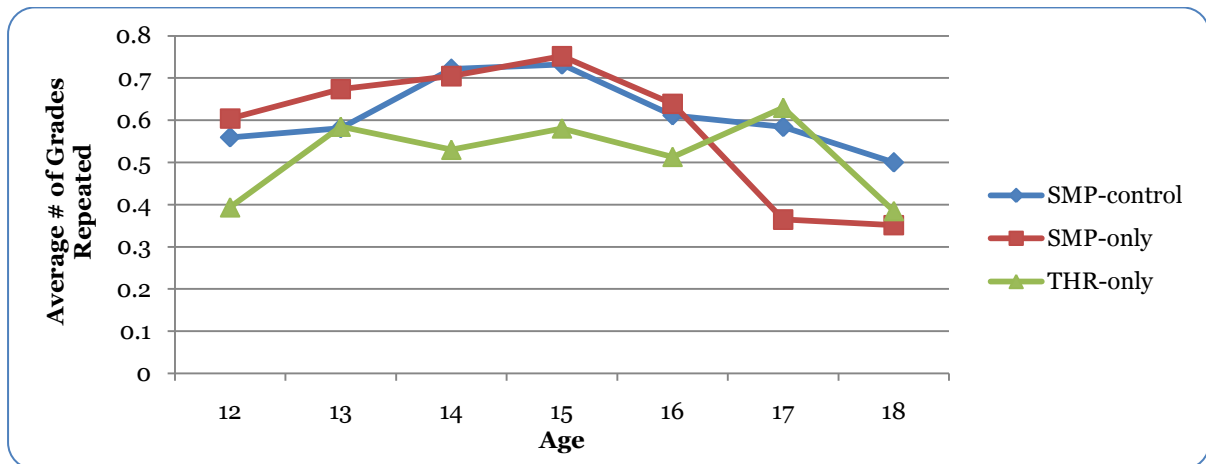
67. Focal group interviews with pupils and teachers confirmed that grades were repeated because students either had difficulties in understanding the subject or because they were lagging behind in subjects due to long periods of absenteeism from schools, mainly due to parents' migration, but also as a consequence of other labour activities.

Drop-Out

68. School feeding does reduce drop-out, especially for grades two through four where effects were significant – between 1.8% and 2.7%. Girls drop-out follows similar trends, but are only significant in grades four and five, in both cases more marked than the general tendency. This is an essential indicator, and the result reveals that school feeding positively influences pupils' and parents' willingness (and capacity) to stay in school.

Graph 9.   Estimated Change in Drop-out Rate (%)
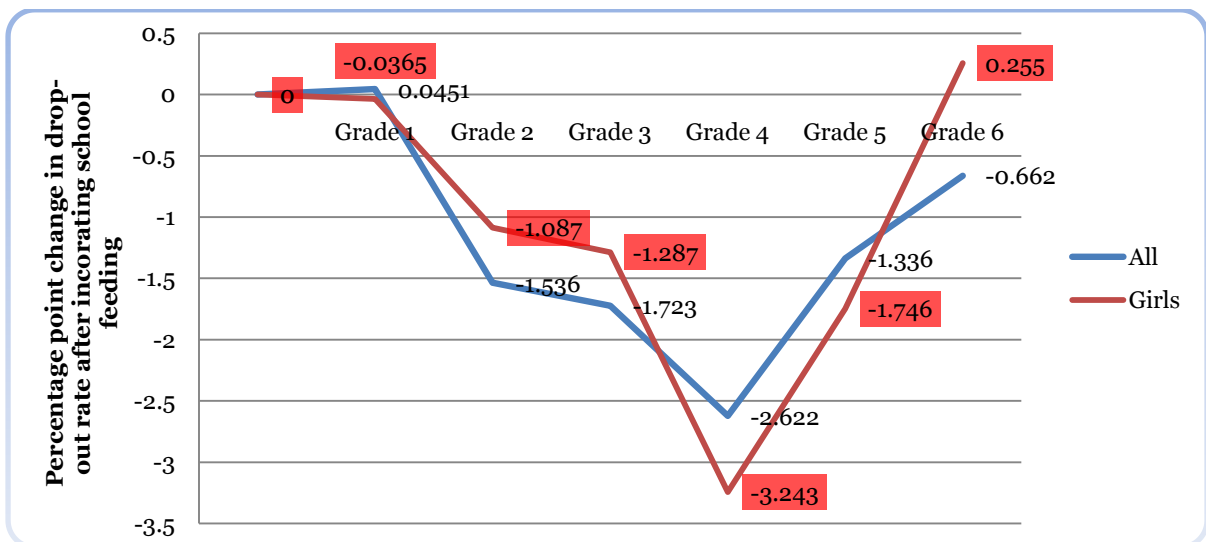
Source: Evaluation Team – EMIS DATA. Note: The graph depicts the estimated average percentage point *change* in drop-out rate after being incorporated in the School Feeding Programme. Example: in the 2nd grade, the value for the series "All" is -1.536 and for the series "Girls" it is -1.087. This implies that, on average, our model estimates that a school's drop-out rate decreases 1.536 percentage point overall and 1.087 percentage point for girls after incorporating the School Feeding Programme. Hence, both overall and for girls alone there is a positive effect of school feeding (in the sense of a lower drop-out rate). For further details, see table 3, Annex E.

69. In grade 4 the counterfactual effect is 2.7% and 1.7% and 1.95% for grades 2 and 3 respectively. The effect on grade 4 corresponds to the significant effects the programme has on promotion rates (see graph 6).

Improved Learning

70. Improved learning is an impact indicator in WFP's school feeding policy and in order evaluate school feeding's 'impact', the evaluation team administered a standardised test for grade six pupils covering the areas of math and language (writing and comprehension). The test was adapted from a MOEYS national standardised test. The purpose of running the test was to gain evidence as to whether performance in targeted schools was better compared to non-targeted schools. Measuring the differences between standardised test performances allows for the establishment of the counterfactual of school feeding interventions and to be able to respond to the SFP's impact indicator on improved learning[41].

71. The test was carried out at 53 schools with 1,227 grade six students taking the test. Of these students, 665 were from control schools and 585 were from WFP-beneficiary schools[42]. The selection of the schools coincided with the strata used for the household-survey. The MoEYS test used is neither applied nor administered nationally, and where schools do apply the test, results are managed locally and not disseminated systematically to MoEYS. Such standardised test results would, therefore, not provide reliable data and, furthermore, would not coincide with the strata (targeted- and control schools) selected for our survey[43].

72. Standard performance tests showed minimal, but non-significant, benefits for targeted schools (a 0.16 score in favour of targeted schools). Interestingly though was the marked effect among girl student's math tests in Siem Reap, where there was a significant effects. This could be interpreted as a result of more regular attendance of female students as a result of THR. When combining the math and language score, however, the difference between targeted and non-targeted schools becomes insignificant. Generally, there was a slight difference in favour of targeted schools in terms of math tests, but no significance as to language tests (see Annex G3-B for a more detailed graph by theme, gender and province).

73. This finding coincides with international evidence; school feeding as a stand-alone intervention does not create improvements in performance. While school feeding promotes enrolment and presumably also promotes more regular attendance among target school population, it does not automatically lead to an increase in students' performance. This finding coincides with other studies on school feeding, including the Kenya School Feeding Impact Evaluation and Impact evaluation on school feeding programme in Laos (see Buttenheim, et al, 2010).

74. The survey considered CFS as strata in its design in order to be able to establish whether or not combined efforts (CFS and school feeding) have any effect on education. According to a regression analysis of the household survey results, there were no observable effects of combining school feeding with CFS[44]. Again, these findings are related to the paragraph above and are assumedly related to contextual factors hindering further effects in terms of improvements.

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[41] It is important to mention that these tests do not measure eventual cognitive improvements
[42] See Annex E, table 2 for a complete list of schools
[43] There are no established pass-rate cut-offs in Cambodia meaning that it is impossible to measure outcomes at this level, i.e. outcome indicator 4.2.4 in WFP's Strategic Results Framework. Another difficulty is that basic education in Cambodia is 9 years, of which the school feeding programme only targets first two cycles (grades 1-3 and 4-6).
[44] See Annex G – Graph G3-D

2B. Nutrition

75. Nutrition results are presented in relation to the school feeding policy logical framework (2009). Specifically for nutrition, the intended impacts of the logical framework are for 'enhanced nutrition and enhanced child health'. Outcomes include improved micronutrient status and improved calorie and protein intake.

76. School feeding in Cambodia runs for 200 days per year or for 10 months for THR. The SMP ration provides 24% of energy requirements of 10-14 year olds per school day, the THR 15%. Details can be found in Annex G-4.

77. The WFP school feeding programme, through the daily meal, provides 593 kcal/person/school-day and based on current evidence this is adequate to support enhanced nutrition and child health.

Enhanced Nutrition and Child Health

Anthropometry – indicators of nutritional status

78. At the population level, no proof was found in differences of weight, height, MUAC between the two modalities (SMP and THR), however this masked striking sex differences (see Annex G3 for full results).

79. The highest income group is significantly heavier and with a higher MUAC than the lowest income group. Surprisingly, income had no effect on height in this study.

80. Regression modelling of data, shows that girls in the SMP are heavier, than girls not in the programme, by approximately 1 kg. This is robust statistically significant evidence of a positive impact on girls' weight. There is partial evidence for increased height of girls in the SMP, by up to 1.56 cm. No significant effect on girls MUAC was seen. The boys' results are less encouraging. There is no clear explanation for this difference and the result warrants further analysis, but it suggests that the meal enables girls to take advantage of the natural pre-pubertal growth spurt. There is partial evidence that boys are shorter in the SMP. There was no evidence of an effect on boys' weight or MUAC.

81. The survey conveyed that THR did not produce any significant results for child growth. These rations are shared among family members and, therefore, have less effect than daily meals provided at the schools.

82. There is an important, positive, synergistic interaction with girls in the SMP and the presence of a latrine in the household. Regression analysis modelling suggests this leads to a height advantage of up to 1.8cm among SMP beneficiaries.

83. There is no apparent effect of the asset class of the household on the height, weight or MUAC of the girls in this population. Again, in boys the situation is less clear as evidence suggests that boys in higher asset class (3) have higher height and weight than the lowest asset class (4).

84. Table 6, in Annex G3, presents the population means of these indices for each programme modality. It shows that the SMP has a mean weight/age and BMI/age higher than the control group which supports the regression analysis findings. The height/age, however, is the same in the groups. Overall, the population means for all the groups of schoolchildren are well below the expected averages of a well nourished population. The poorest index is the Height/Age, which is used to measure stunting or chronic undernutrition. The mean Height/Age in the school child population in Cambodia is -2.06 standard deviation from the mean, whereas, the definition of clinical chronic undernutrition is -2 standard deviation from the mean.

Child Health

85. Families were asked how many days their child had been absent from school due to illness in the past two weeks. There is good evidence from regression analysis that both the SMP and THR lead to a reported reduction in absence from school due to illness in girls but not in boys. This supports the findings of improved anthropometric status in girls as improved nutrition is also expressed by immune function.

86. Children in the SMP had the lowest rate of absence due to illness at 0.98+/-0.2, followed by THR at 1.07+/-0.29. The control groups had a higher rate of absence at SMP-control at 1.28+/-0.23 and. However, the SMP+THR group had the highest rate, with 1.43+/-0.52. One explanation of the conflicting result for SMP+THR is the older average age of this group.

87. 30% of all respondents reported infections in the previous two weeks, with 'fever' being the most common. Reported morbidity was lowest in the SMP+THR group at 0.24+/-0.06 (mean +/-95% confidence interval), followed by the SMP group at 0.30+/-0.03, the THR group at 0.31+/-0.05, SMP-control at 0.32+/- 0.04.

88. In addition, data on whether or not the child had been dewormed in the past six months and whether or not s/he received/recently received VAS were gathered as potential confounders to the survey results, but no significant information was uncovered.

Micronutrient status

Haemoglobin and iron deficiency anaemia

89. Anaemia, including iron deficiency anaemia, is endemic in Cambodia but data on school-age children is very limited. This study found prevalence rates of between 59% among the control group and 83% in the SMP+THR for children 8-17 years of age. WHO classify rates >40% as severe anaemia. Further detail can be found in Annex 3G-e

90. Regression and matching analysis models have been used to examine the mean haemoglobin levels and the prevalence rates of anaemia[45] and the survey showed that there is no effect of SMP on the haemoglobin levels of girls. Given the SMP food basket (with no iron fortified commodities) no impact on haemoglobin levels or anaemia status would be expected.There is some evidence that girls in the poorest asset class have lower haemoglobin (0.40g/dl) than those in the higher asset class. The SMP ration is not currently designed to correct anaemia, but the combination of foods fortified with vitamin A and iron could lead to an effect.

91. The survey showed that there is fairly strong evidence of a negative effect on boys in the SMP. They have a mean haemoglobin level 0.37 g/dl *lower* than the control using matching analysis. This does not, however, translate to significantly higher levels of anaemia. The differences in haemoglobin levels of boys cannot be accounted for by differences in food intake.

92. The percent of individuals consuming iron-rich animal foods in the previous 24 hours was estimated from the IDDS: 76% consumed fish, 46% flesh meat and 8% organ meat. The breakdown by programme type showed that no difference was seen in the consumption of iron rich foods regardless of participation in the SMP. No important gender differences were found.

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[45] Based on WHO cut offs

Other micronutrients

93. Vitamin A deficiency was investigated using the proxy indicator of reported night blindness. The proportion reporting night blindness was lowest in the SMP+THR group at 5.3%, followed by 5.5% in the SMP group. However, it was high in the THR group at 7%. The percentage in the control was 7.2%. These differences are not statistically significant using standard t-tests but do suggest an improved vitamin A status for those in the SMP (See Annex G3–F for graphic illustration of results).

Improved Calorie and Protein Intake

Individual dietary diversity score – a proxy indicator for nutritional adequacy

94. Measurement of the IDDS[46] yielded the following results which suggest an increased dietary diversity[47] for children in the WFP programme:

- SMP   6.20   Control   5.67
- THR   5.14
- SMP+THR   5.29

95. Data analysis from the household survey has shown that the SMP has a robust and significant association with IDDS a proxy for nutritional adequacy. This holds true across gender, provinces and wealth groups using a number of regression analysis models giving an advantage in the order of 0.7 IDDS score. By sex, this is a 0.65 increase in girls, 0.95 in boys. As expected, the THR has no significant effect on the IDDS of boys or girls.

96. Prey Veng had an IDDS of 6, which is categorised as "good" whereas Siem Reap has a lower score of 5.4 and categorised as a "medium" level of dietary diversity. The CAS (2008) covered different population groups but gave results of 4.6 for children 6-35 months and 4.7 for mothers. This could be because mothers prioritise feeding their children over themselves and/or reflective of an improved situation over 2008 and/or that the SMP supports a higher IDDS.

97. The SMP has proven to have a robust, significant positive effect on the IDDS of school age children. The IDDS results by gender and province for dietary diversity are outlined in the table 4 below:

Table 4.   IDDS by Province and Gender

	Individual Dietary Diversity Score (maximum score 14)				
	SMP&THR	**Control**	**SMP**	**THR**	**Total**
Prey Veng	-	5.8	6.5	5.5	6.0
Siem Reap	5.3	5.5	5.8	4.8	5.4
Total	**5.3**	**5.7**	**6.2**	**5.1**	**5.7**
Female	5.3	5.7	6.1	5.1	5.6
Male	5.3	5.6	6.2	5.2	5.9
Total	**5.3**	**5.7**	**6.2**	**5.1**	**5.7**

Source: Evaluation Team – Household Survey. Number of observations: SMP&THR(187) SMP-Control(652), SMP-only(676), THR-only(399).

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[46] Guidelines for measuring household and individual dietary diversity. Version 4. December 2008. FAO/EU/FANTA.

[47] IDDS can be interpreted as follows: <=3 low dietary diversity; 4-5 medium DD and >=6 high DD

98. The IDDS increases with the asset class of the household. However, this does not carry through for the beneficiaries of THR rations. This is supported by the table below showing that IDDS increases through the wealth groups in this study (see table 5).

Table 5.   IDDS by Asset Class and Modality

Asset Class	Modality				
	SMP&THR	Control	SMP	THR	Total
Asset Class 1 (poorest)	5.3	5.1	5.6	5.0	5.2
Asset Class 2	5.3	5.8	6.1	5.2	5.7
Asset Class 3	5.2	5.7	6.4	5.4	5.8
Asset Class 4	5.1	5.9	6.5	5.1	6.1
Total	**5.3**	**5.7**	**6.2**	**5.1**	**5.7**

Source: Evaluation Team – Household Survey. Number of observations: SMP&THR (187) SMP-Control (652), SMP-only (676), THR-only (399).

99. Although girls appear to have a lower IDDS than boys, the tendency is not statistically significant by the regression analysis (see table 6).

Table 6.   IDDS by Gender and Modality

Gender	Modality				
	SMP&THR	Control	SMP	THR	Total
Female	5.3	5.7	6.1	5.1	5.6
Male	5.3	5.6	6.3	5.2	5.8
Total	**5.3**	**5.7**	**6.2**	**5.1**	**5.7**

Source: Evaluation Team – Household Survey. Number of observations: SMP&THR (187) SMP-Control (652), SMP-only(676), THR-only(399).

Other variables

100.   The food provided by SMP is well accepted by the community and 90% of children reported eating all of the food each day. 7.3% reported that it is not available to them each day. Only 1% responded that they didn't like the food, and another 1% reported that they were not hungry.

101. The taking home of food from the SMP is rare, with 95.6% of respondents never doing so. 1.5% reported taking food home rarely, 1.2% 1-2 times a week, 0.1% 3-4 a week and 1.6% every day.

102.   Additional analysis of the IDDS shows that convenience food, including sweets and sugary drinks, are regularly consumed by the majority of the children surveyed. Graph 16 illustrates that this occurs in all programme groups, but does not suggest by all children. The field observations also support this finding with the majority of school grounds visited being littered with sweet wrappers and vendors of sweets and ice creams were seen trading on the school grounds. These food stuffs have a low nutrient density and are not seen as a positive development. The CAS 2008 found sweets to be the third commonest food group consumed in the <five year population after rice and fish. This relatively new phenomenon in Cambodia requires monitoring and further investigation (See Annex G3–H for graphic illustration of results).

103.   The differences in water and sanitation infrastructure between Prey Veng and Siem Reap were quantified by the household survey (see Graph 18). Water source type was categorised into "improved" or "unimproved" sources to ease interpretation.

Graph 10.   Adequacy of water source by province
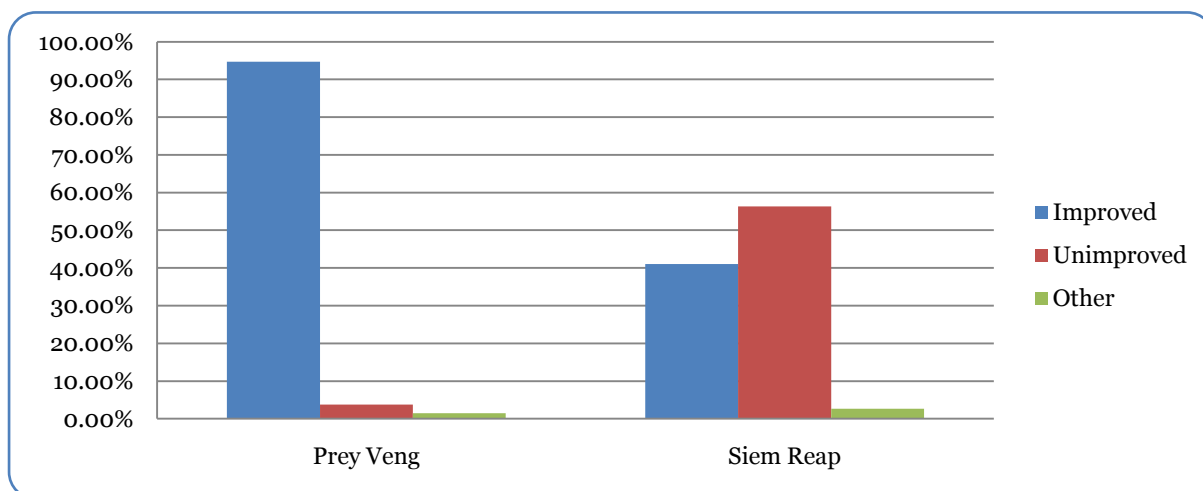
Source: Household Survey. Number of observations: Prey Veng (1000), Siem Reap (1014).

104.   However, having an improved or unimproved water source did not translate clearly into increased rates of morbidity though this needs further statistical analysis (see Graph 19).

Graph 11.   Prevalence of infections by water source
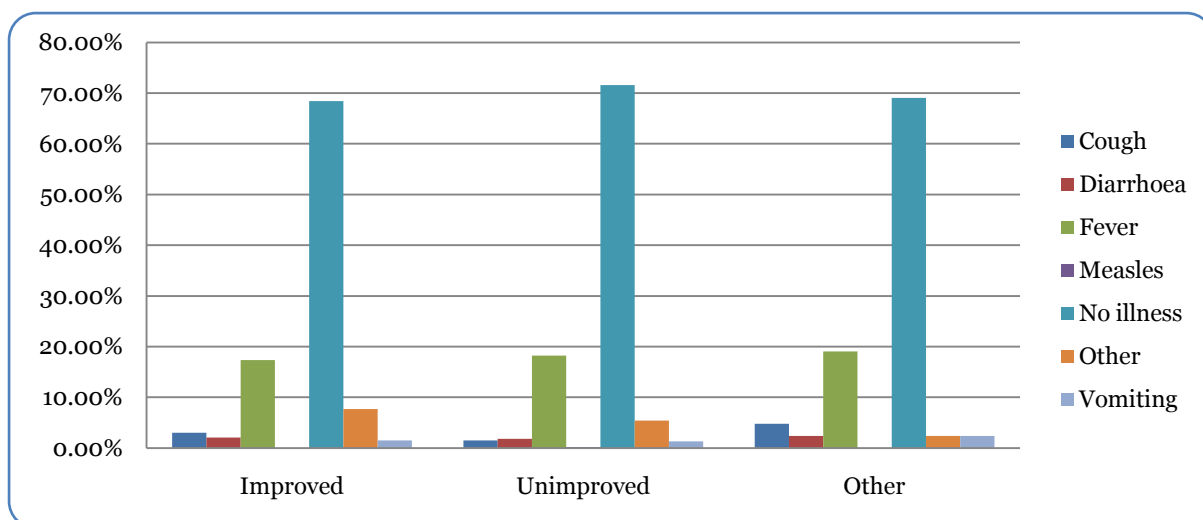
Source: Household Survey. N = 2014.

Sufficiency of WFP Rations

105.   The sufficiency of WFP rations was assessed using WFPs NutVal computer programme as the new WFP guidance was not yet available. The planned WFP food basket for school feeding provides 593 kcal, 16.4 g protein, 90µg vitamin A (Retinol equivalents), 4.3mg of iron, 184 µg iodine. This represents 27% of energy and 33% of protein requirements/person/day[48]. Further details are in G3-F.

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[48] Based on calculation in NutVal 2006 using requirements for 10-14 year olds.

106.   The planned WFP ration for SMP provides:

- 26.8% of the energy requirements (based on 2210kcal/day) per school day or

- 14.7% of energy requirements averaged out per day over the year or

- 7.4% for a child in a two shift school receiving the meal alternate weeks.

107.   Considering breaks in the pipeline in recent years (see Annex G2), the provisions provided are as follows:

- 24.4% of the energy requirements (based on 2210kcal/day) per school day or

- 13.4% of energy requirements averaged out per day over the year or

- 6.7% for a child in a two shift school receiving the meal alternate weeks.

108.   The school survey assessed food consumption by evaluating food use per day in schools stores. The results, that tie in closely with the expected food usage, are as follows:

Table 7.   Estimated Food Consumption of Schoolchildren in SMP

Type of food in KG/child	One shift school	Two shift school	Average	WFP ration
Average rice	0.105	0.104	0.104	0.100
Average oil	0.006	0.006	0.006	0.010
Average salt	0.003	0.003	0.003	0.003
Average canned fish	0.021	0.020	0.020	0.020
Average yellow split pea /child	0.016	0.016	0.016	0.030

Source: Evaluation team – School Survey. N = 2014.

109.   The THR provides 15% of daily energy requirements if one assumes full family sharing in a family of 5.7, according to average household size found in the household survey results. Children receiving SMP and THR gain 21% and 28% of daily energy requirements averaged for the year in two shifts and one shift, respectively. The Cochrane Collaboration suggests that to be successful, a SMP needs to provide 15% of daily energy requirements[49].

Other findings

110. No interventions that would directly influence the household survey were found. These could have included iron supplementation to schoolchildren, more frequent deworming, VAS to schoolchildren or to women of reproductive age and use of multinutrient powders. Caritas ran an anaemia reduction programme in the survey area, and have indeed used WFP SMP as a conduit for this in the past. However, none of the Caritas-served villages were chosen during the random selection for the household survey. The USAID-funded A2Z programme is working via the Ministry of Health and WHO to promote the use of multimicronutrient 'Sprinkles' in two provinces in Cambodia but were not within this study's survey sample.

111. Currently, there are considerable efforts being invested in improving the nutritional status of the Cambodian population. Appropriately, these have focused on the promotion of breast feeding, infant and young child feeding practices, improvement of micronutrient deficiencies and the management of acute undernutrition. Some significant nutritional gains have been made over the past decade with exclusive breastfeeding rates increasing from 11%

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[49] Greenhalgh et al; BMJ 2007; Realist review to understand the efficacy of school feeding programmes

in 2000 to 60% in 2005, and iodine fortified salt is accessed by 74% of the population[50]. These gains will have contributed to the improved nutrition data recorded until 2008.

112. However, the MMR remains high at 470 deaths/100,000 live births (anaemia, maternal nutrition and female child growth are significant contributors to maternal mortality) and the declining trends of undernutrition appear to have halted by 2008. The next demographic and health survey (DHS) in 2010 will inform whether or not the new economic growth is enough to restart an upward trend in nutrition. The increasing Gini coefficient, continuing urbanisation and growing numbers of landless poor suggest that the country will have pockets of highly vulnerable, poorly nourished people.

113. The current nutritional interventions in Cambodia are focused on children up to five years of age and on women of reproductive age (15-49 years). There is very limited information and data on children of school age who are the focus of this particular study.

114. Anaemia is endemic in Cambodia with a prevalence rate of 62% of children under five years and 48.4% in rural women[51]. Reports were received of recent studies that have suggested up to 50% of Cambodians have particular genetic haemoglobinopathies, and as such may not be responsive to iron supplementation or fortification strategies[52].

2C. Value Transfers

115. The emphasis on the value transfer was on analysing to what extent the two different modalities of the WFP School Feeding Programme in Cambodia (SMP and THR) represent a value that have significant outcomes at households level, particularly in terms of income generation, wealth status, food security and physical protection. The evaluation divided households into different categories (classes) in order to differentiate effects accordingly. If the value transfer is of sufficient value, the assumption is that it can serve as, or contribute to, social safety nets, hence potentially mitigating negative effects stemming from poverty or natural disasters on vulnerable and poor households.

Value of the Ration

116. The value of the food distributed through SMP or THR varies depending on the seasonal food price variability and the ration composition. The value presented in Table 8 was calculated considering:

- the average of monthly 2009 prices of second quality rice in rural markets (source: WFP VAM),

- the average of monthly 2009 prices of meng bean (source: Ministry of Agriculture, Forestry and Fisheries),

- the average monthly 2009 prices of oil on rural markets (source: WFP VAM),

- the average price of canned fish and iodised salt on Preay Veng and Pouk markets at the moment of the evaluation (Siem Reap Province).

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[50] CAS 2008
[51] Cambodian DHS 2005
[52] Reported by WHO Susan Jacks, UNICEF during interviews

Table 8.   Annual Value of the Ration

	Number of rations per year	**Annual value of distributed rations (riels)**
SMP	140 days*	91,282
THR	10 months	407,132

*the number of meals prepared per year is 200, and it is estimated that shift 1 (during which meals are served), represents 70% of the students. The average number of meals / student / year is, therefore, 140.

117. Table 9 compares the value of the rations transferred with household income for the last 6 months[53].

Table 9.   Ration Value and household Income

	Average income (6 months, riels)	**6 months value / household* (riels)**	**%**	**National poverty line[54]**
SMP beneficiaries: all asset classes	1,863,434		4.9%	
Asset Q 1	653,577		14,0%	
Asset Q 2	1,626,766	91,282	5,6%	
Asset Q 3	1,845,513		4,9%	
Asset Q 4	3,189,160		2,9%	1,828,133
THR beneficiaries: all asset classes	865,013		23.5%	
Asset Q 1	785,065		25,9%	
Asset Q 2	833,293	203,566	24,4%	
Asset Q 3	1,133,293		18,0%	
Asset Q 4	1,435,468		14,2%	

*The average number of children attending school from grades 1 to 6 within the SMP beneficiaries sample is 2, according to the household survey.

118. Expectedly, the ration transferred represents a much higher proportion of household income for THR beneficiaries than for SMP beneficiaries. On the one hand, the net value of the ration is higher for THR than SMP, even if the benefit is limited to only one ration per household for THR, whereas an average of two children per household benefit from SMP. On the other hand, THR beneficiaries are selected among poor and poorest households in the community, and have an average income much lower than that of SMP beneficiaries, who come from all the classes.

119. For both SMP and THR beneficiaries the value of the rations, compared to household income, represents up to 14% and nearly 26% for both modalities, respectively. The comparison with the national food poverty line for rural areas shows that for SMP beneficiaries asset classes 3 and 4 are above the poverty line, whereas all the THR beneficiaries' classes are below the poverty line.

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[53] Income was asked to households on a 6 months recall period in the survey, considering that one year was too long of a period to obtain reliable information.
[54] Total poverty line in rural areas was 1,753 Riel in 2004 (WFP country food security atlas, Cambodia). It is multiplied by the average household number of members, and by 6 months (182 days).

Income Generation and Time Saving Factors

120.   One assumption of the school feeding policy log frame is that parents save additional time when children go to school, and that additional income may be generated by the parents during that 'extra' time.

121. While some interviews revealed cases of intensifying income generation as a consequence of the SFP[55], the survey results indicated that both SMP and THR beneficiaries represent a lower total income than the households of the control group. Missing essential longitudinal data (i.e. changes over time), the evaluation cannot account for eventual rises in income among beneficiary groups that may have occurred as a result of school feeding. In both cases, to be conclusive would only be possible if different groups were observed over time in order to measure their relative changes in terms of income generation.

122.   Concerning time saved as a result of SFP, the survey indicated that there is a positive effect of school feeding on the opportunity to save time when children go to school. This tendency is observed for all the asset classes. Time saved benefits women more than men (for details on results, see Annex G3-L).

123.   When time is saved, it is mostly applied to household chores, and in a much lower extent for income generating activities, as shown in Graph 12.

Graph 12.   Utilization of extra time
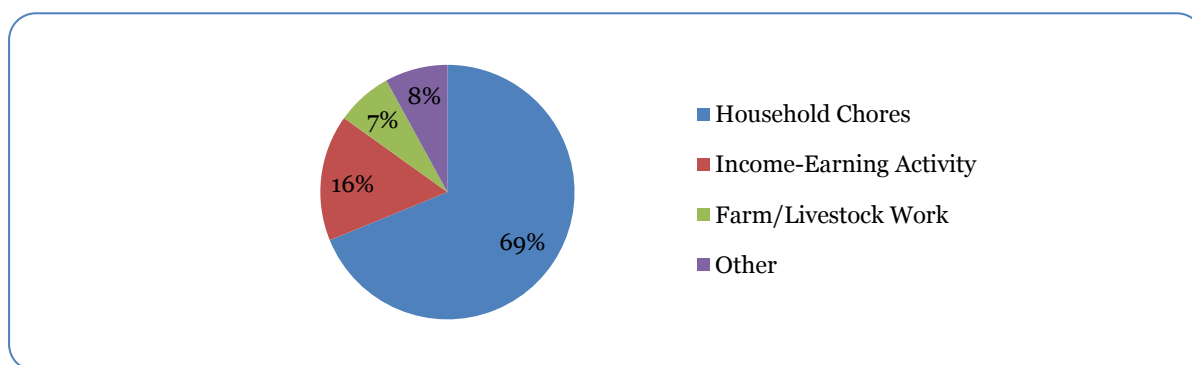
Source: household survey

124.   Interviews with beneficiaries revealed that SFP allow women to save time from child attendance when children receive a meal at school, as they come back later from school than if they don't receive a meal. On the contrary, it does not allow households saving time on food preparation. The majority of households prepare food twice a day, except during the planting season (approximately one month – during which the evaluation was carried out), and for the richest category of the population, who may eat three meals/day throughout the year. For the majority of households meals are taken at approximately 11 am and 5-6 pm. The school meal, served at breakfast (around 6.30am in most schools), does not substitute preparation of other meals at household level.

125. With regards to the utilisation of the ration, both quantitative[56] and qualitative data suggest that the food rations are consumed by beneficiaries: children at school or household members at home (THR modality). Meals are served at school in the morning before class

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[55] Some interviewed women explained they had extra income thanks to the time they were saving due to school feeding (children are enrolled and attend school more regularly).
[56] Only one respondent, out of 616 THR beneficiary households surveyed, declared having sold a part of the ration.

starts and according to survey; the food is rarely taken out of the school (see paragraph 98). As far as THR is concerned, bi-monthly rations are distributed to households and rations are either consumed or stocked with the household's other food reserves for later consumption. Therefore, there is no direct income originating from sale of food, especially in the case of THR. However, the accuracy of this finding may be distorted by possible bias in interviewees' answers, as they may have been reluctant to say that they have sold part of the food. In addition, beans have not been distributed in THR for nine months since the beginning of the 2009/2010 school year, and this commodity is more likely to be sold than other ration commodities, as it is not usually part of household's diet.

Impact on Assets

126.   In order to assess impact on assets, households were divided into four asset classes. These groups were defined through participatory wealth index with village chiefs and community members in communes of both provinces included in the evaluation. A scale of asset scores was calculated for each group and households are classified in groups according to their respective asset score (see Annex E).

127. SMP beneficiaries have proportionally less representation than non-beneficiaries in the poorest and poor groups, whereas they have a higher representation in medium- and wealthy groups. This result is coherent with the average asset score for SMP beneficiaries and control group: 4.0499 and 3.593 respectively. This finding suggests that SMP has a positive effect on asset possessing and on beneficiary repartition into wealth groups, leading to a higher representation of households in the two better-off categories (see Graph 13 for graphic presentation of results).

Graph 13.   Asset Groups SMP beneficiaries and non-beneficiaries
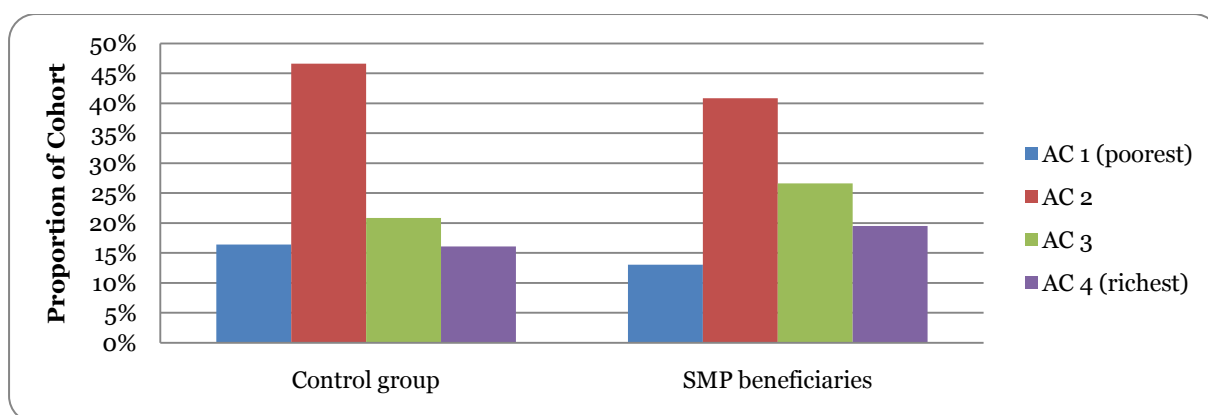
Source: Household Survey

128.   However, the qualitative focus group and household interviews indicated that there was no investment in assets by beneficiaries through extra income or through food earnings. This outcome is more likely to be a consequence of an eventual decrease of asset loss for SMPP beneficiaries when facing a problem like unforeseen health expenditures or difficulties to purchase food. However, neither the survey nor the qualitative data provide sufficient evidence to interpret this tendency.

129.   As far as THR beneficiaries are concerned, it was not possible to establish an accurate comparison with the control group. Asset scores can only be compared as an average for all the wealth categories mixed, as they actually determine the belonging to one wealth group or to another. The average asset score of THR beneficiaries is, as a result of the targeting, lower

than the score of the control group (2.095 and 3.593, respectively). However this is due to the fact that THR beneficiaries mostly pertain to the 'poorest' and 'poor' categories (respectively 33% and 55%) whereas the control group shows a lower representation of households in these categories (16% and 47, respectively).

130.   Focus group discussions and household interviews indicated that there was no investment in assets by beneficiaries through extra income or through food earnings. The survey did not provide sufficient evidence to confirm this tendency for any of the modalities.

Impact on Food Security

131. The food security outcome has been evaluated using the Household Food Insecurity Access Scale (HFIAS), which allows for the creation of a household food insecurity ranking based on four categories (food secure, mildly food insecure, moderately food insecure, severely food insecure). Graphs 14 and 15 compare the repartition of the HFIAS categories to SMP and THR beneficaries and control groups respectively. THR beneficiaries have a slightly lower representation in the 'severely food insecure' category than the control group, suggesting that the programme has meant a shift from this 'accute food insecurity' category to 'less insecure' categories. This tendency was not observed for SMP beneficiaries, who have higher representation in the 'severly food insecurity' category than the control group.

Graph 14.   SMP and HFIAS categories
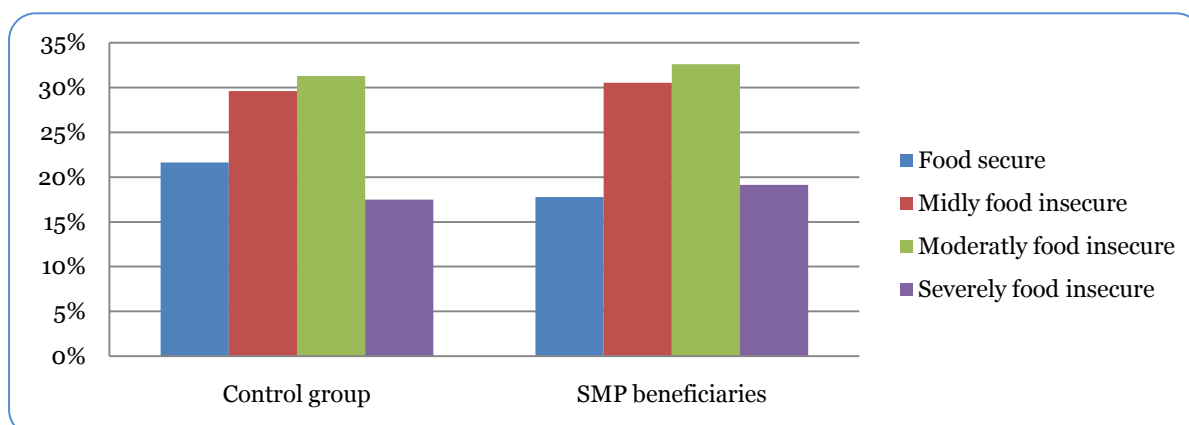
Source: Household Survey. Number of observations: SMP-Control (652), SMP-only (676).

Graph 15.   THR and HFIAS categories
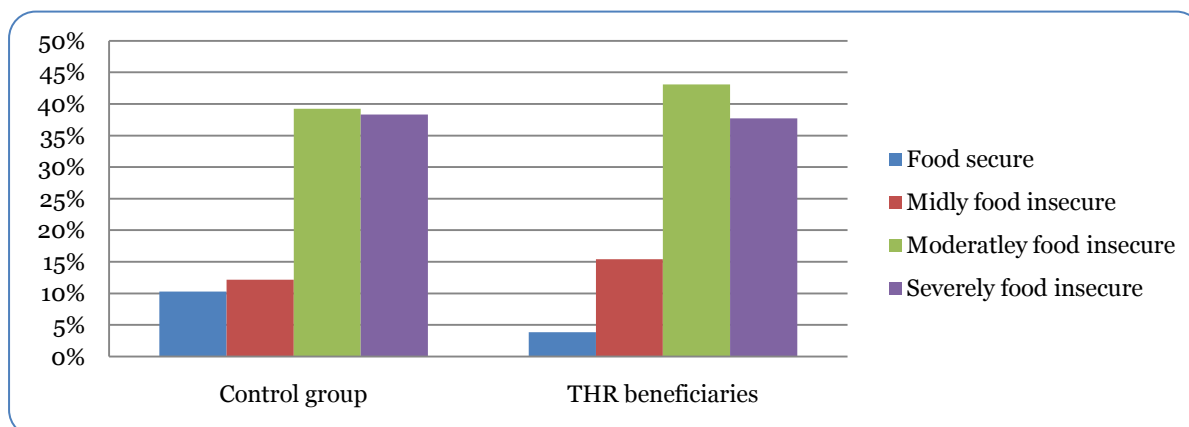
Source: Household Survey. Number of observations: SMP-Control (652), THR-only (399).

132.   Annual variation in terms of food security means that these results only allows us to draw conclusions for the period under which the survey was conducted The survey was carried out approximately one month before the lean period started, when most households had not yet faced difficulties in purchasing food. The lean period begins when households finish consuming their own rice production and results may have been different if the questionnaire had been applied during the lean period, meaning between July and November.

133.Nonetheless, the difference between beneficiary groups and control groups suggests that beneficiaries will be more resilient to food shortages during the lean period. THR allows poor families to extend the period during which they do not have to buy rice. According to qualitative interviews, a five-member household consumes about two kg of white rice per day, which means that the THR represents approximately 15 days of rice consumption for households of this size (2 kg/day x 15 days = 30 kg; THR beneficiaries receive 30kg of white rice for two months). As an example, when 5-members households harvest enough rice for six months of consumption, they will be able to save 3 THR rations of 30 kg of rice, which represents in total 45 days of consumption. As poor households generally do not sell rice, THR will therefore allow beneficiary households to delay the need to purchase rice for about 45 days

134.   Thus, during the lean period, THR allows beneficiary households to spend less money on rice purchase. Considering an average price of rice during the lean season of 2,000 riels/kg[57], five-member households would save about 60,000 riels (approximately 14.6 US$) for 15 days of rice consumption (2 kg x 2,000 riels x 15 days). According to all of the THR beneficiaries that were interviewed, as well as 17 women who perceive extra income and with whom focus group discussions were conducted, the money made available from supplementary earning or the ability to save money is almost completely dedicated to the purchasing of non-rice food items to improve their diet during the lean period. Thanks to the THR, beneficiaries are able to enrich their diet with fish, vegetables or eggs during the days they remain on THR rice in the lean season.

Effects on Child Labour Activities

135.During the qualitative interviews, it emerged that one of the main constraints of poor households in sending their children to school, is the need for children to work. Several informants considered THR to be very important for beneficiaries, as it represents a credible compensation for the income they may lose if their children attend school. The survey focused on the primary activity of children, which is education for a large majority of children (see table in Annex G3), and does not allow to identify differences between beneficiaries and non-beneficiaries in term of primary activity. Differences may have been observed on secondary activities.

Effects on Early Marriage

136.   It is widely documented that the more education girls receive, the better prepared they are to take informed decisions that may influence their life positively in their adolescent or adult life. The evaluation was asked to look at effects of school feeding on early marriages. The absence of baseline data on early marriages meant that the survey could not estimate these effects over time. The survey did include questions concerning age of marriage and

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[57] According to WFP VAM, the retail price of second quality white price in rural areas fluctuated between 1,908 and 2,166 riels/kg in the period July-December 2009

crossed that information with years of schooling. The graph below presents the relation between highest grade completed for female household members (in the age group 18-35) and the average age of marriage. While completion grades are generally very low among the targeted population, there is a slight tendency that the age of marriage increases slightly the more education women receives. In order to attribute effects from school feeding on early marriage it would be necessary for WFP to define longitudinal indicators and then compare tendencies with control groups (see Graph in Annex G3-M).

3. How does school feeding create impact?

137. According to the WFP's School Feeding Policy, school feeding intervention logic spans wide and based on this assumption there is potential for impact in areas as diverse as nutrition, household economy and education. This assumption is partly supported by international evidence (see Adelman, Gilligan and Lehrer, 2007; Adelman et. al. 2008; Ahmed 2004). However, before impact can be expected, cohesiveness between different factors must be in place, including a conducive learning environment, child-health and adequate nutrition, economic- and social capital within household that allows children to enrol and attend regularly. For WFP, these factors are both 'contextual' – understood as being outside WFP's control from a WFP-programmatic perspective – and 'internal', meaning that WFP can take programmatic measures in order to ensure that interventions best meet overall objectives.

138. This part analyses factors, external and internal, and relate these to WFP's school feeding policy and relates these to the results found under the Cambodian SFP. On this basis, the chapter outlines causalities that explain why some results identified have been achieved while others were not.

3A. Role of Contextual Factors (outside WFP's control)

Education

139. There are, at least, two sets of contextual factors influencing school feeding results that are outside WFP's control; they can be categorised as either supply-side or demand-side factors.

140. On the supply-side, a hindering factor is that pupils attend school in an already poor performing system where most teachers are untrained and often absent, where many pupils do not have adequate learning materials and where conditions at schools are inadequate for quality learning[58]. Under such circumstances, school feeding cannot compensate for the negative effects that these factors have on learning. This argument is sustained by other studies. In an evidence study on Food for Education (Adelman et al 2008), it was found that learning effects cannot be achieved if the instructions (quality of education) is of little value, and that poor school quality lowers the benefits of participation and discourages attendance. According to the World Bank & WFP, *"Helping children to be more able and available to learn will not improve education achievement unless it is matched by the delivery of quality education"*, (the World Bank & World Food Programme, 2009, pp. 21).

141. Quality education is a challenge in Cambodia, and efforts to improve learning for children require multiple and concerted interventions. This evaluation included CFS strata

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[58] See Purcell et. al., 2010 & Finan, 2009. These problems were also highlighted through interviews with stakeholders and beneficiaries in Cambodia

to compare eventual effects from CFS (both as stand-alone and complementary activities with SMP). As mentioned earlier in the report, the survey did not capture significant differences between the different strata. That said, however, body of evidence suggests that improved conditions at schools (access to water, latrines, information campaigns, etc.) do contribute to an improvement of the learning environment, but they may still be insufficient to compensate for contextual factors that negatively influence learning outcomes. In fact, a study of CFS activities in Cambodia concluded that "*statistical results are inconclusive, and that the overall "flavour" of the results suggests that CFS has not had an impact on student learning*" (Marshall 2007, pp. 19).

142.   As for the demand-side factors, irregular attendance caused by migration, household or out-of-household labour activities, amongst others, also have a negative effect on children's schooling. This is particularly the case among poorer households in food insecurity and vulnerable areas.

143.   Other demand-side factors also determine or affect pupils' performance such as parents' socio-economic status and education level. Parents' low education influences parental decisions considering opportunity costs of investing in children's education. The household survey found that the level of education among parents is very low; the highest completed grade among poorest households is just above two years, not reaching four years in the case of the asset class 4 (see graph in Annex G3-G). Interviews with pupils supported the argument indicating that some parents do not show much interest in the education of their children.

144.   A last hindering factor relates to the cultural perception of girls' education. Interviews with parents and teachers emphasized that girls' access to education and drop-out is linked to opportunity costs of having girls going to school. The dominant view is that education of males is more important than that of females[59].

Nutrition and Food Security

145.It is known that considerable progress has been made in reducing undernutrition in the under-five population in Cambodia, largely due to the high level of success in increasing the prevalence of exclusive breast feeding over the past decade. This is a contributing factor that will positively impact on the nutritional status of schoolchildren over time.

146.   Food stability is one key element of food insecurity and this is considered to be one of the most difficult challenges at national level in Cambodia. Despite having seen high levels of national food production and sound economic growth, inequity as a result of the landless' inaccessibility to land and unequal distribution of wealth, affects the food security of Cambodia's poorest. Added to this come their vulnerability towards natural disasters, as many of them live in areas prone to droughts *and* floods (see also paragraph 151) and economic shocks (fuel and food prices). At the individual level this means that poor households will struggle with access to food, hence keeping them exposed to chronic undernutrition.

147.WHO and UNICEF both reported high levels of haemoglobinopathies (genetic anaemia's) in the Cambodian population. It is not known if there are age/sex differences here that affect the anaemia levels of WFP beneficiaries.

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[59] See also: Gender and Development in Cambodia: An overview; Working Paper 10; Cambodia Development Resource Institute; 1999.

Value Transfer

148.   The evaluation identified three external factors that influence the extent to which school feeding may produce outcome in terms of income generation, asset creation and households' capacity to cope with threats. These factors are: 1. asset ownership of households; 2. availability of human capital; 3. characteristics and magnitude of the threats households are faced with.

149.   Assets. The opportunity for households to increase their income often depends on the access to productive assets or mobilisation of human capital for labouring. In rural Cambodia, investment in productive asset is done mainly through private credit-schemes (non-community based). Obtaining credits require assets that serve as guarantee. Poor households, normally characterised by the few assets they possess have therefore limited opportunities to access credits and are therefore less likely to increase their income. This is crucial in terms of understanding vulnerability as the use of credit is widely used as a coping mechanism.

150.   Human capital. Poor households are also characterised by their low human capital. In paragraph 143 we saw that the 'poorest' and 'poor' categories are those whose head of family and spouse have the lowest education level (see graphs in Annex G3-G). This relates directly to the intergenerational cycle of poverty as low levels of education tend to impede families from getting out of poverty. It also means that they remain vulnerable and, therefore, are also more likely to adapt negative coping mechanisms.

151. Exposure to threats. For the SFP to function well as a safety-net mechanism, it is important to consider the difficulties that households are faced with and how families cope with such difficulties. The evaluation found that for Cambodian rural households, threats can be divided into two groups which differ in magnitude and the consequences they have on livelihoods. On the one hand, droughts and floods affect large parts of the country every year[60]. Once households are affected by one these threats, livelihoods are affected, particularly the rice harvest, which leads to an extended lean period. Variability of food prices, both seasonal and as result of the 2008 situation of rising food prices, can be classified in the same category of threats, generating the same types of household adaptation mechanisms. The majority of the population cope with these difficulties by intensifying their income generating activities through different labour activities or seasonal migrations. Another mechanism is modifying the quality and the quantity of the food they consume or by purchasing food through credit and loans.

152. On the other hand, households are exposed to more severe, idiosyncratic threats, such as disease and the death of family or household members. This second category of shocks differ from the first in that households are forced to develop different types of coping mechanisms with more severe and long-term consequences, such as the sale of assets or permanent migration. Four vulnerable household members were interviewed who had recently faced cases of diseases and medical treatments represented costs of one million riels (approximately 243 US$) or more, which forced them to either sell off land or taking up loans using land as a guarantee. These families all informed that they did not see any possibilities of being able to pay back the credit, hence facing the risk of losing their land.

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[60] According to the National Committee for Disaster Management (NCDM) and WFP, who carried out in 2003 a mapping of vulnerability to disasters, around 270 communes out of 1,621 communes in Cambodia, and 260 communes are exposed respectively to droughts and floods. According the WFP CFSVA (2008), an estimated 40% of Cambodian households live in an area that is prone to droughts or floods.

3B. The Role of Implementation Factors (within WFP's control)

153.Though there are strong contextual factors influencing the School Feeding Programme, WFP has different ways of ensuring that school feeding interventions become as efficient and effective as possible.

154.Successful and sustainable school feeding programmes are based on two main features: (i) high community involvement to ensure that meals are prepared in time, provision of additional food items and managing food stocks and (ii) government commitment in terms of strategic, political and financial support to school feeding operations. The Cambodia School Feeding Programme is well functioning and organised through its different coordinating levels down to each of the beneficiary schools, including reasonable community involvement and participation. What needs to be further improved is government ownership and proven commitment, combined with more strategic capacity development efforts. These are factors that, if addressed by WFP, would enable more effective and sustainable school feeding operations. A way of enhancing government commitment is to provide evidence that school feeding does support government efforts and objectives. This is an area where there is still room for improvement for WFP.

155.Evidence suggests that food assistance is more effective the more vulnerable the beneficiary population and WFP has considerably improved targeting and geographical concentration over the years, which assumedly has improved programme effectiveness. Despite the geographical targeting, which is based on food insecurity prevalence at provincial level, SMP-beneficiary schools are primarily selected based on education performance indicators, hence not necessarily targeting most vulnerable groups within target areas. The survey also highlighted that there is still room for further refinement of targeting in order to better include the *poorest* and *most vulnerable* groups.

156.The SMP has a marked effect on the dietary diversity of all beneficiaries. While the SMP is a blanket *distribution*, it is also targeted with regards to *food consumption,* as the children eat the food at school amongst their peers, whereas in the case of the THR the food is a dry ration and becomes part of the household economy for family sharing. In terms of nutrition outcomes, family sharing means lower effectiveness on each of the THR-beneficiaries, which emphasises the need to clearly consider the purpose of the school feeding intervention.

157.This study assessed levels of haemoglobin, and low levels are usually caused by a lack of iron in the diet. However, other causes include illness particularly malaria and intestinal parasites, genetic haemoglobinopathies and folate and/or vitamin B12 deficiency. We could not assess the direct cause of the high levels of anaemia found. WFP Cambodia is currently testing two different types of iron fortified rice for acceptability of use/taste and if successful the introduction of fortified rice to the food basket could contribute to a reduction of iron deficiency anaemia. If fortified rice is shown to contribute to a reduction in iron deficiency anaemia in boys and girls then it could be a useful addition to the programme.

3C. The Interaction between Factors

158.   In this evaluation, when we refer to the impact chain we relate to WFP's school feeding policy's log frame (see table in part one). The log frame is used as reference model in order to explain how interventions (SMP and THR) may or may not lead to desired impacts, as they are outlined in the log frame.

159.In part 2 A, B and C the evaluation identified the effects of SFP related to education, nutrition and value transfer and in parts 3A and B we analysed factors, hindering and enabling, that were identified to have influence on results and consequently outcomes and impacts.

160.   There is an ever increasing body of evidence that School Feeding Programmes have effects on certain education outcomes, as well as effects on nutrition. There is less evidence, so far, on how school feeding, understood as a value transfer, may have effects on households. This evaluation shows that for all three areas both contextual and programmatic factors influence outcomes and impacts.

161. The School Feeding Policy is built upon a logical intervention basis to which the School Feeding Programme in Cambodia is generally well aligned. The causal relations between input, output, outcome and impact levels very much depends on contextual factors as well as implementing factors. School feeding programmes, unlike conditional cash transfer programmes, depend on other contextual factors in order to reach its objectives. Providing a meal alone does not automatically lead to expected outcomes and impacts, and this was the case for all three aspects evaluated.

162.   Outcomes and impacts largely depend on the type of input envisioned for all three areas, but there is a more clear causality for nutrition and value transfer as long as the input (i.e. ration size, content with fortified rice, etc) is adequately designed to meet either value transfer or nutrition needs. If nutrition purpose is well defined and the food ration, ideally fortified, is adapted to local circumstances (i.e. food insecurity, chronic undernutrition, high prevalence of aneamia, etc.), effects on increased micronutrient status and improved calorie and protein intake is very likely to take place. The same goes for value transfer; if targeting meets those most in need with a ration size of sufficient value (compared to what it would cost to purchase locally by the household), there seems to be few elements hindering some kind of effect in terms of increased effects at household level in terms of diversifying food consumption, increasing income or investments in assets.

163.   On the contrary, the causality between school feeding and certain outcomes, as they are outlined in the school feeding policy, is more dependent on contextual factors than nutrition and value transfer. School feeding is an incentive for increased enrolment and it generally has positive influence, though not marked effects or impacts, across main indicators within the primary education cycle.

164.   Apart from effects that conceivably are of more linear character, the evaluation provides evidence that SMP and THR ration modalities produce different results and that it is therefore important for WFP to define the purpose of the School Feeding Programmes. This is illustrated by the following examples:

-   SMP and THR has the same effect on enrolment but not on attendance;
-   A combination of both SMP and THR seems to have an effect on girls' math performance, but following the marked effects among THR beneficiaries, this modality may have attributed more significantly.
-   THR does not contribute to same nutritional results as SMP;
-   SMP has effects on health of girls and reduces morbidity, yet there were no evidence suggesting that THR did;
-   SMP promotes higher dietary diversity than THR
-   THR have more effect on value transfer than SMP;
-   THR has more effect on food security and households' coping mechanisms than SMP.

165. While all activities under the two modalities are within the policy log frame of WFP's school feeding, the lack of clear effects also means that the evaluation was not able to identify clear interlinkages that demonstrate causalities between one area and the other. Nonetheless, we may anticipate that there can be causality between improved child-health (i.e. decreased morbidity), more regular attendance among girl students and effects among THR beneficiaries in math testing, but the same linkage cannot be established for other areas.

166.   Improved food security through the THR modality could not be linked to educational outcomes, at least not within the timeframe of the evaluation, but longitudinal studies may shed more light on eventual causalities. Nonetheless, based on evidence from international studies, it can be rather safely assumed that improved food security, and the possibility of investing more in assets, can have an effect on children's schooling as opportunity costs may outweigh the short-term benefit of taking the children out of school.

167. In the Cambodian case, THR is, on the one hand, an adequate tool to target specifically vulnerable populations, as it has potential to function as a social safety net mechanism. It is also effective as incentive for poor families to keep children, especially girls, in school. On the other hand, SMP is a modality that serves nutritional purposes and raises enrolment figures in targeted areas. Nonetheless, both cases underline the need to define the purpose of intervention and identifying the most appropriate modality. Both modalities work and may produce more marked effects and impacts, but each in their own way.

168.   Most interventions are highly dependent on contextual factors and that is the reason why partnerships and concerted efforts are relevant if WFP expects to reach expected impacts. These **partnerships** concerns governmental institutions, NGOs and international partners.

4. Conclusions and Recommendations

169.   This evaluation has focused on three dimensions of the SFP in Cambodia; education, nutrition and value transfer. By focusing on the counterfactual we have, within each dimension evaluated, identified effects that are clearly attributable to WFP's school feeding interventions. We have also analysed areas were effects have been less significant or not significant at all. In both cases, consideration has been given to factors that may or may not be influenced by WFP.

4A. Overall Assessment

170.   School feeding interventions are diverse and impel different outcomes. In order for these modalities to create expected outcomes or impacts, therefore, defining purpose and modality is of key importance. The evaluation reinforces the argument that there is a need for partnership as WFP have little influence over external factors that highly influences programme outcomes and impacts.

Education

171. School meals themselves have proven to be an incentive for parents to **enrol** their children to school. Moreover, at this age, children are too young to carry out any labour activities and opportunity costs are, therefore, largely in favour of enrolling them in school.

172. The evaluation also concludes that children, to some extent, attend school more regularly under the conditionality of receiving the THRs. **Attendance** outcomes are determined by contextual factors and parents' dispositions concerning opportunity costs of sending their children to school, especially as children grow up and becomes potential labourers. There were also tendencies, although these were generally not significant, that school meals have positive influence on attendance, but results were not significant. THR is, therefore, considered to be the most effective modality in terms of increasing attendance and we attribute that effect to its conditionality and the relatively high value the monthly ration has for poorer households.

173.There are no significant effects found in relation to **promotion** and **repetition** rates for either modality, and the evaluation did not establish a clear-cut causal explanation. Education quality is low in Cambodia and it can, therefore, not be expected that the SFP causes the expected impact in terms of **improved learning**. WFP is aware of that and different partnerships testimonies the need for concerted efforts in order to bring about expected impacts. The collaboration with UNICEF's CFS initiative is positive but does not suffice in raising quality education. The reason seems to be that contextual factors have 'neutralised' statistically visible effects, but the partnership is positive and pointing in the right direction, but more is needed if impact is to be expected.

174.Therefore, the general lack of significant effects, except from enrolment, drop-outs and attendance, among THR beneficiaries, is ascribed to contextual factors. These include low-quality education, irregular attendance, teacher absenteeism and poor physical conditions, but may also be caused by socio-economic conditions as targeted families are among the poorest and most vulnerable. Under such circumstances, parents seek alternative income opportunities or measures that often negatively affect pupils' attendance.

175.Furthermore, taking vulnerable children out of school may have negative consequences, both in terms of their micro-nutrient status and medium and longer term perspectives according to WFP's policy framework (i.e. increased earning, improved food security, intergenerational effects, among others).

176.Furthermore, the evaluation found that enrolments would drop if SFP were terminated. This underlines the need for ensuring that school feeding interventions are sustainable if lasting effects (impacts) are to be expected.

Nutrition

177.The combination of chronic undernutrition and anaemia will have severe impacts on child health and morbidity and the economic productivity of the population as a whole. Furthermore, additional impacts will be felt in the girls as short stature and anaemia are both risk factors for death in childbirth. In Cambodia the MMR has remained stubbornly high and is currently unlikely to reach its MDG.

178.This study has highlighted that schoolchildren have a poor nutritional status with high levels of chronic undernutrition and anaemia. This evaluation surveyed over 2,000 children and they have an average weight/age of -1.6 Standard Deviation (SD) below the mean, height/age of -2.06 SD below the mean (-2SD is the cut off for chronic undernutrition) and a BMI/age of -1.41 SD below the mean. The prevalence of anaemia ranges between 59-86% where the WHO cut off for a severe public health problem with anaemia is 40%.

179.The SMP has been shown to have a significant and positive impact on the growth of girl children in this study leading to a higher height, weight and BMI. Additionally girls in the SMP reported less illness in the two weeks prior to the survey. Therefore, for the girl child, it is clear that the SMP achieves the impact objectives of the school feeding log frame – improved nutrition, reduced morbidity. This benefit will go some way to break the intergenerational cycle of undernutrition that is so pervasive in Cambodia. However, there is a long way to go down that road. Additional work will enhance current information gaps to support and replicate the findings of this study, which was based on control groups without longitudinal data. Ideally, the same children from this study should be followed up on in one or two years time to measure their actual growth, compare case control and to remove some possible confounding factors.

180.   The SMP has also led to small reduction haemoglobin in the boy child, but not the girl child, and the reasons behind this need to be fully explored even though it did not translate into an increased prevalence of anaemia. There is no indication that the lower haemoglobin is caused by a difference in dietary intake particularly since in this study the boy child has a higher IDDS than girls. Boys also show little difference in consumption of iron rich and vitamin A rich foods at the population level see Graphs in Annex G3-F. The IDDS is a good indicator of population level food intake but is subject to seasonality so the data is valid for the month of June and not year round. Cambodia has high levels of haemoglobinopathies and these too may need to be considered to fully explore the gender differences in levels of haemoglobin.

181. The THR programme has had no significant effect on either child growth or morbidity.

Value Transfer

182.   In terms of value transfer, the household survey documented that the THR represents a higher proportion of household income than the meal provided at the school. This result was expected since THR beneficiaries are selected among poor and poorest households (asset classes) in the community. The THR beneficiary families generally have lower incomes than SMP beneficiaries. The survey demonstrated that THR represents up to 26% of household income for lowest asset classes and 14% for the same classe among SMP beneficiaries..

183.   As far as income is concerned, the evaluation did not find evidences of a positive effect of SFP. Only a minority of beneficiary households can intensify or diversify their economic activities thanks to a saving of time. No evidences were found on eventual cash saving from food purchase that could be invested in productive activities.

184.   At the household level, food consumption was analysed through the IDDS for THR beneficiaries only. This indicator doesn't show a significant positive effect of the programme. However, it is believed that the period the survey was carried out negatively influenced the results. Qualitative interviews showed that THR allows beneficiaries to mitigate the loss of diet diversity they experience during the lean season. It is, therefore, a positive impact on the reduction of negative coping strategies.

185.   As far as food security is concerned, there is no positive effect observed for either SMP or THR beneficiaries. On the contrary, the HFIAS showed a higher representation of non beneficiaries in the food secure categories. As for IDDS, results may have been different if the survey had been carried out during the lean season, especially for THR beneficiaries. However, the available figures of prevalence of food insecurity show that the proportion of beneficiaries of the programme is higher than the proportion of food insecure households within the population, which is probably a cause of the lack of impact observed on food security.

186.   The study revealed higher asset scores for beneficiaries than for non beneficiaries, and lower representation of beneficiaries into the two poorest categories of households, in benefit of the two wealthiest ones. However, according to qualitative interviews, this difference is more likely to be due to a reduction of the sale of assets, as a coping strategy, than to an investment of eventual food savings or extra income in assets.

187. Finally, there was no positive impact found on physical protection. Child participation to economic activities was found marginal as their primary activity, for both beneficiary and non beneficiary groups, without significant differences between each other. However, THR is considered by key informants a credible compensation for poor households who are obliged to have their children participate in the family budget.

4B. Conclusions and Recommendations

188.   The School Feeding Programme is aligned to the government education goals and national strategy framework and in the past 10 years, it was effective in its aim to support primary education by contributing to increased enrolment, attendance and promotion and to reduced drop-out. The SFP has also marked effect on nutrition and value transfer to households. Notwithstanding, the school feeding modalities of SMP and THR affect education, nutrition and value transfer differently. **Recommendation 1:** *WFP Cambodia should consider the differentiated effects of modalities in future programming.*

189.   The National Social Protection Strategy is the most appropriate framework for future school feeding operations in Cambodia and THR is the preferred approach as it targets those most in need and is simultaneously more effective as social protection scheme by representing a higher value for beneficiaries than SMP. **Recommendation 2***: It is recommended that a higher proportion of WFP Cambodia resources be dedicated to THR.*

190.   SMP is an incentive for families to enrol their children, and the modality has a stronger effect on nutrition than THR but is less targeted to poorest households, meaning that it is not ideal in terms of value transfer (in the Cambodian context). As opposed to a specific targeting of vulnerable groups, SMP is geared toward large-scale programmes and, as such, it is an important complement to sector-wide efforts aimed at increasing enrolment (and attendance). Government commitment is key for such programmes to work on a more sector-wide basis. **Recommendation 3**: *It is recommended that WFP Cambodia focuses its involvement in SMP on supporting the development of a sustainable nationally owned SMP. The core of WFP's involvement would be in supporting the development of capacities within national institutions and developing a sustainable procurement modality. Based on current experience, WFP and the Ministry of Education should identify a pilot modality for later roll-out.*

191. The positive effect of SFP could be significantly increased through mutually reinforcing partnerships with agencies dealing with improving quality of education. **Recommendation 4:** *It is recommended that future interventions be part of comprehensive packages, and the collaboration with UNICEF should be enhanced to include other partners as well.*

192.   Schoolchildren in Cambodia suffer from high levels of chronic undernutrition, underweight and anaemia which will contribute noticeably to child health, economic productivity and the MMR. **Recommendation 5:** *It is recommended that WFP Cambodia continues its participation in multi-sectoral initiatives, such as the technical working groups, which are required to combat childhood undernutrition that is both efficacious and cost-effective.*

193.   Tackling childhood undernutrition is a vital priority in Cambodia, and different ways of doing so need to be explored. The use of fortified rice within the SFP could be a useful contribution to this if it can be demonstrated that it is efficacious in both sexes in reducing the prevalence of iron deficiency anaemia. WFP school feeding policy highlights that WFP will ensure that school meals are nutritious, fortifying them where needed. **Recommendation 6:** *It is recommended that WFP Cambodia carefully studies, designs and implements fortified School Feeding food distribution.*

194.   A higher resolution on targeting with focus on household level vulnerability criteria will increase effects and impacts of the THR modality, especially with regards to value transfers and retention of children from poorer families. **Recommendation 7:** *It is*

recommended that targeting be improved in order to better ensure that most vulnerable populations are targeted.

195.Current school feeding monitoring measures change over time on key indicators, but does not compare with non-treatment areas. In order to improve monitoring, prospective analysis must be improved and the use of smaller control groups operationalised as part of WPF's regular monitoring. **Recommendation 8:** *It is recommended that WFP use control groups and longitudinal indicators for future monitoring purposes in order to strengthen results based programming and enhance evidence of interventions in all three areas of education, nutrition (including anaemia) and value transfer as contemplated in the school feeding policy.*

5. Acronyms

ADB	Asian Development Bank
CARD	Council for Agricultural and Rural Development
CAS	Cambodian Anthropometric Survey
CDHS	Cambodia Demographic and Health Survey
CDRI	Independent Cambodian Development Policy Research Institute
CFS	Child-Friendly School
CFSVA	Comprehensive Food Security and Vulnerability Assessment
CO	Country Office
EMIS	Education Management Information System
EMOP	Emergency Operation
ESP	Education Strategic Plan
ESSP	Education Sector Support Programme
GDP	gross domestic product
HFIAS	Household Food Insecurity Access Scale
IDDS	Individual Dietary Diversity Score
IFPRI	International Food Policy Research Institute
IMR	infant mortality rate
IPC	Integrated Food Security and Humanitarian Phase Classification
KAPE	Kampuchean Action for Primary Education
MDG	Millennium Development Goals
MMR	Maternal Mortality Rate
MoEYS	Ministry of Education Sports and Youth
MT	Metric Ton
MUAC	Mid-upper-arm-circumference
NER	Net Enrolment Rate
NGO	Non-Governmental Organisation
NIS	National Institute of Statistics
NSPS	National Social Protection Strategy
OE	Office of Evaluation (WFP)
PRRO	Protracted Relief and Recovery Operation
SD	Standard Deviation
SFP	School Feeding Programme (THR and SMP)
SMP	School Meals Programme (elsewhere referred to on-site feeding)
SSFS	Standardised School Feeding Survey
THR	Take Home Rations
TOR	Terms of Reference
TWG	technical working groups
U5MR	Under 6 mortality rate
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
VAS	Vitamin A supplementation
WFP	World Food Programme
WHO	World Health Organization

6. Annexes

A. Terms of Reference

WFP Office of Evaluation (OE)

Mixed Method Impact Evaluation of

WFP's School Feeding Programmes

In Cambodia (2000 -2010)

Terms of Reference

1. Background

1.A.   *Definitions*

1. WFP's Office of Evaluation defines 'impact' as: "Lasting and/or significant effects of the intervention – social, economic, environmental or technical – on individuals, gender and age-groups, households communities and institutions. Impact can be intended or unintended, positive and negative, macro (sector) and micro (household)".[61]

2. For the purpose of this evaluation **school feeding** is understood as programmes that are implemented through schools as the food distribution point, and can include wet and dry feeding distributed at any point in time during the school day (breakfast, mid-morning, lunch) and Take Home Rations. Operations that focus on pre-school children or provide food-for-training outside a school context are not included.

1.B.   *WFP's Corporate Approach to School Feeding*

3. **Overview.** The world community has regularly re-stated its commitment to education as a human right. Access to and quality of education are also regarded as an essential plank for poverty reduction: human capital – education, knowledge, skills, access to and understanding of information – is part of the livelihoods approach that recognizes poverty to go beyond a lack of income. Education is embedded in the MDG: MDG 2 (achieve universal primary education) and MDG 3 (promote gender equality and empower women, with targets for eliminating gender disparity in education). School feeding also relates to MDG 1 (eradicate poverty and hunger). A series of multilateral events since 1990 made explicit linkages between education, nutrition and health and have established action plans and special funds.

4. School feeding has been cited as one of WFP's programme areas since its establishment in 1963.[62] By 1993, pre-primary and primary school feeding accounted for more than half of WFP's development commitments.[63] Between 2006 and 2008, as the largest implementer of school feeding programmes in the world, WFP invested US$ 475 million (14% of total

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[61] Drawn from definitions agreed in ALNAP and OECD/DAC.
[62] S*chool Feeding Handbook*, WFP, 1999 referencing FAO Conference Resolution 1/61 of 24 Nov.1961.
[63] Ibid.

budget) in some 70 countries, reaching an average of 22 million children in school, about half of whom are girls. School feeding beneficiaries[64] accounted for around 20% of total beneficiaries.

5. WFP's School Feeding Handbook 1999 recognised that there was insufficient evidence that school feeding addresses malnutrition and therefore explicitly focused on educational outcomes: increasing enrolment and attendance, including reducing gender disparity, and improving learning outcomes through enhancing ability to concentrate). Take-Home Rations, particularly, aimed to reduce the opportunity cost of sending children to school. School feeding was at the core of strategic priority/objective 4 in WFP's **Strategic Plans** 2004-2008 and 2006-2009 and was clearly aligned with MDG2 and MDG3.

6. **New Strategic Plan:** In the latest strategic plan (2008-2011), school feeding is embedded in a broadened Strategic Objective 4, which aims to reduce chronic hunger and under-nutrition. It sets a goal of increasing levels of education and foresees school feeding addressing short-term hunger, and thus improving learning abilities, providing a safety net by ensuring children attend school both through food in school and take-home rations, and addressing micro-nutrient deficiencies. By using locally produced foods, school feeding is also expected to have a positive impact on local markets. Through a positive contribution to learning results and school completion, it may also have an effect on the inter-generational cycle of hunger. The Strategic Results Framework (approved in 2009), flowing from the Strategic Plan, carries forward indicators from the Indicator Compendium (above) and includes pass rate.

7. The WFP School Feeding Policy 2009[65] sets six **objective areas,** all within the concept of safety nets as a sub-set of broader social protection systems. The six areas are: education; nutrition; gender equality in education; value transfer to households; a platform for wider socio-economic benefits; and capacity development for governments. Key indicators are established for outcomes and impact in each of these areas.

8. The policy envisages various models for school feeding with different degrees of (de)centralization. It introduces 8 Standards Guiding Sustainable and Affordable School Feeding Programmes, that guide phased transition from programmes that rely mostly on external (WFP) funding and implementation to programmes to those that rely on national funding and implementation.

1.C.   Country Context[66]

9. Cambodia has a population 14.7 M (2008) of which about 35% live below the national poverty line. It ranks 137/182 on the human development index (2008).

10. The IPC[67] shows that most provinces in Cambodia are chronically food insecure. The severity is exacerbated by limited economic growth in rural areas, when compared with urban areas, and drought. Drought is seen as a major cause of reduced food availability in many provinces, driving up food prices since 2003. Local markets can hardly stabilize food prices because of high transaction costs to move food from surplus to deficit areas and a

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[64] Excluding pre-schoolers. *WFP Annual Performance Reports 2006 through 2008*
[65] WFP/EB.2/2009/4-A
[66] From Integrated Food Security and Humanitarian Phase Classification (2007)
[67] Integrated Food Security and Humanitarian Phase Classification (2007)

trade regime with neighbouring countries that is distorted by export restrictions on rice and tariffs on imports. This situation has a negative impact on livelihoods, as various negative coping strategies are adopted to meet food requirements, such as seasonal migration, increasing child work, withdrawal of students from school, debt, deforestation, sales of livestock and land. Beyond reduced household access to food, the IPC shows that nutrition and health status are poor in most of the provinces. About 2.6 million live in extreme poverty.

11.*Food Consumption and Dietary Diversity*: Household food consumption, especially in rural areas, accounts for about two-thirds of the total expenditures, indicating the subsistence nature of the livelihoods. In general, the diet is largely rice-based in rural areas, indicating potential risk for protein and micronutrient deficiencies and poor nutrition status.

12.*Health and Nutrition*: The final report of the 2005 Cambodia Demographic and Health survey (CDHS) suggests remarkable improvement in the health and nutrition status of the population since the 2000 survey. The report shows that infant mortality (IMR) declined from 95 to 66 deaths for every 1,000 live births and under 5 deaths (U5MR) declined from 124 to 83 for every 1,000 live births. This represents a decrease of over 30 %. Still, one in every 11 Cambodian children dies before reaching 5 years of age (2008). Maternal mortality is 470 deaths per 100,000 live births (2008), from 440 in 2001. Despite progress made, the health status of the Cambodian people is still among the lowest in South East Asia. Health status warrants continued multi-sector interventions, addressing nutrition and food security, access to safe water and sanitation and basic health services, including health and nutrition education. The report states nutritional status of children has improved in the past five years. 2007 statistics show that 37 % of children are stunted, 36 % underweight and 7 % are wasted, compared

Figure 1 : IPC Cambodia (2007)

Legend
■ Generally Food Secure
■ Low Chronically Food Insecure
■ High Chronically Food Insecure
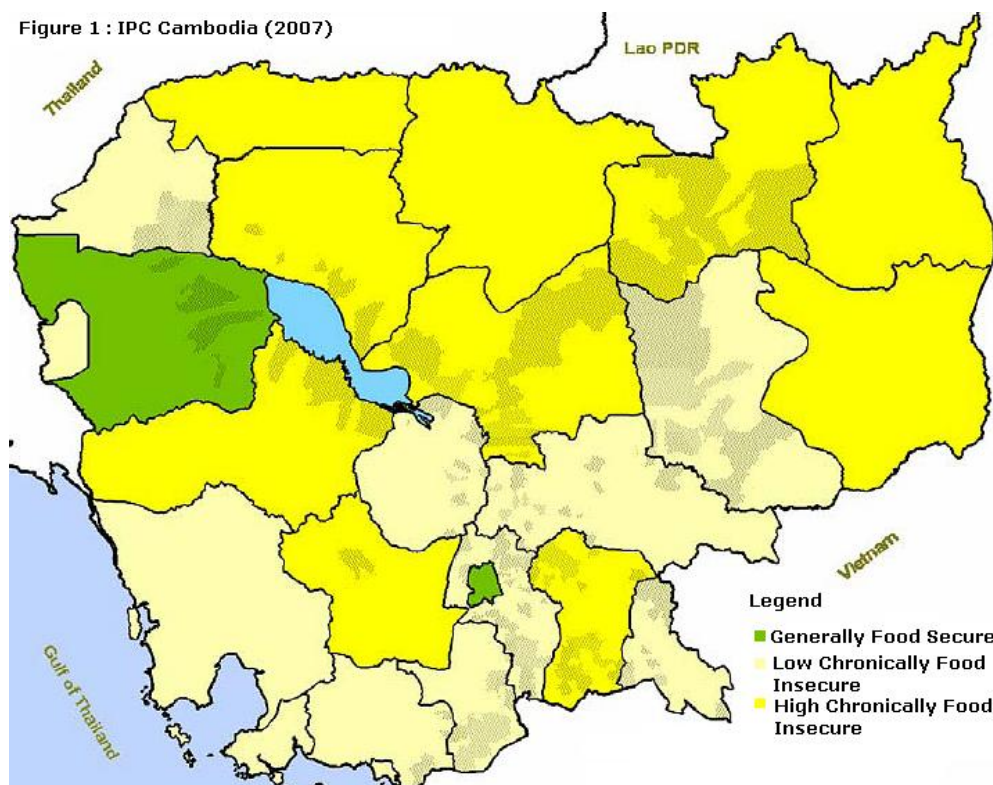
with 45 % stunting, 45 % underweight and 15 % wasting in 2000. Poor dietary diversity, with 65 % of calories provided by cereals, results in micronutrient deficiencies, such as anaemia and vitamin A deficiency. In general, children with uneducated mothers and those living in the poorest households are most likely to be malnourished. The data also shows stunting is apparent even among children less than 6 months of age (6 %). Stunting increases with the age of the child. There is very little difference in the level of stunting by gender.

13.*Education*: Although Cambodia has made considerable progress in expanding basic education in recent years, high drop-out and low retention rates and an acute shortage of trained teachers, especially in remote rural areas, remain major concerns.

14.Cambodia has a high net enrolment rate at primary school (94.4%[68] 2008-09). The lowest primary enrolment rates are recorded in Rotanak Kiri (77.7%). National primary completion rates are 81.1% with the lowest rates recorded in Modul Kiri (70.6%).

15.Net enrolment in primary schools and in secondary schools, as well as transition rates from primary to secondary levels, have all shown varying degrees of improvement. According to 2008-09 education management information systems (EMIS) data records, enrolment rates are getting closer to universal. In a recent WFP survey (2007) it was found that the primary school net enrolment rate for the districts covered by the WFP School Feeding Programme was 92.0% as against a nation-wide net enrolment figure of 91.3% in 2005-06. It is important to note that net enrolment rates have seen a steady increase since 2001; the abolition of school fees in 2001 being a key reason.

16. The survival rate (the proportion of students who stay in education) from grade 1 to grade 9 has been stable between 2001 and 2008 at about 33% as against a target of 52 % (UNDP, 2007).

Graph 1: Attainment Profile per grade (age 15 - 19)
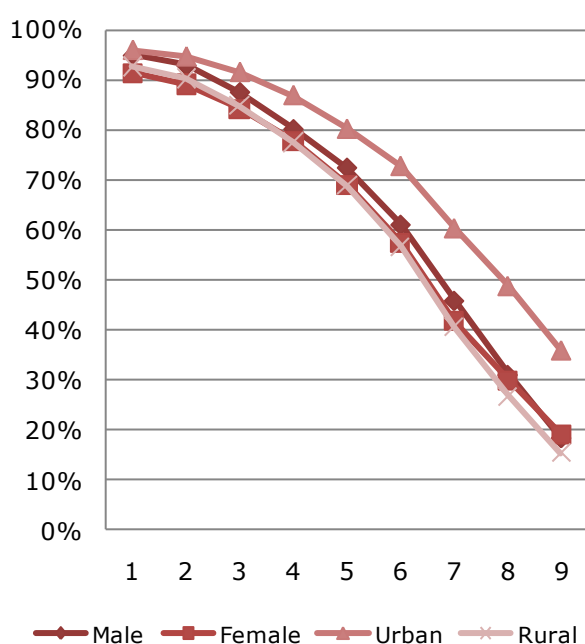
Graph 2: Attainment Profile per grade (age 15 - 19)

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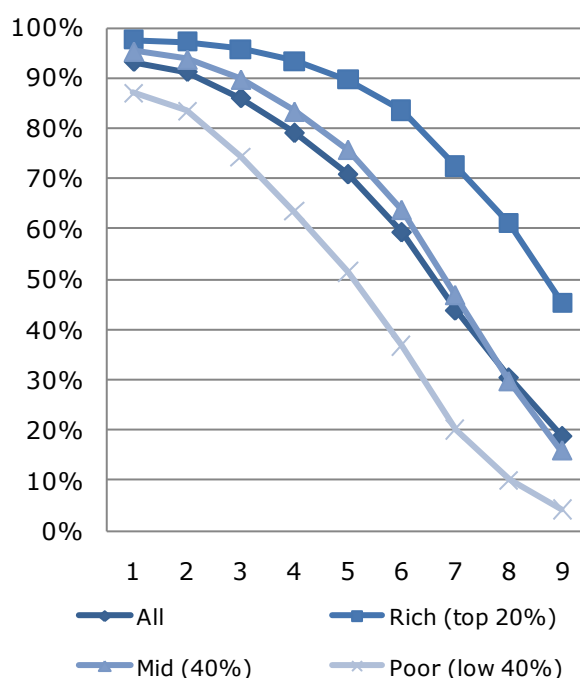
[68] EMIS 2008-09

17. The 2005 Cambodia Demographic and Health Survey developed attainment profiles reproduced above (graph 1 and 2). They show a progressive decline in the percentage of 15-19 years old that have completed each grade 1-9. While the urban cohort presents a better attainment performance than its rural counterpart, it is between the poorer and richer cohorts that the difference is the most striking.

18. EMIS data gross enrolment rates indicates that there are many over-aged children stuck at the primary level, which creates disincentives for parents to send their children to school. Overage enrolment is caused by either late school entry, slow progress through school, or a combination of the two.

19. One key strategy in the Government's education sector to achieve education goals by 2015 is to expand and better target the primary school feeding program and grades 7-9 incentives program[69]. By Jan 2009, proper strategies and targets are yet to be included in the Education Strategic Plan.

1.D. WFP's School Feeding Programme in Cambodia

20. In 1999, theMoEYS together with WFP launched a pilot school feeding programme. Since 2001, WFP assists primary school children through its PRROs (see table 1 overleaf).

Table 1: WFP operations in Cambodia starting after JAN 2000

Project Number	Project Type	Start Date	End Date	Title	School feeding component
6297	EMOP	Oct-00	Mar-01	Assistance to flood victims in Cambodia	
6038.1	PRRO	Jan-01	Dec-03	Food Aid for Recovery and Rehabilitation in Cambodia	X
10170.0	Dev	Apr-02	Dec-03	Support to Maternal and Child Health	
10352	SO	May-04	Apr-05	Asia Emergency Response Facility (AERF)	
10305.0	PRRO	Jul-04	Dec-06	Assisting People in Crisis	X
10170.1	Dev	Jun-05	Nov-06	Support to Maternal and Child Health	
101702	Dev	Jan-08	Dec-10	Sup. for Mother-and-Child Health	
10305.1	PRRO	Jan-08	Dec-10	Assisting People in Crisis	X

Donor support to the Cambodia PRRO operations has varied during the past years ranging between 50% and 150% of operational requirements[70].85 % of approved budgets. Episodes of pipeline breaks appear to have negatively affected the school feeding programme, particularly at the end of 2006, leading to attendance rate drop of some 35% points.[71]

Graph 3: PRRO s Operational Requirements vs Confirmed Contributions (M USD)
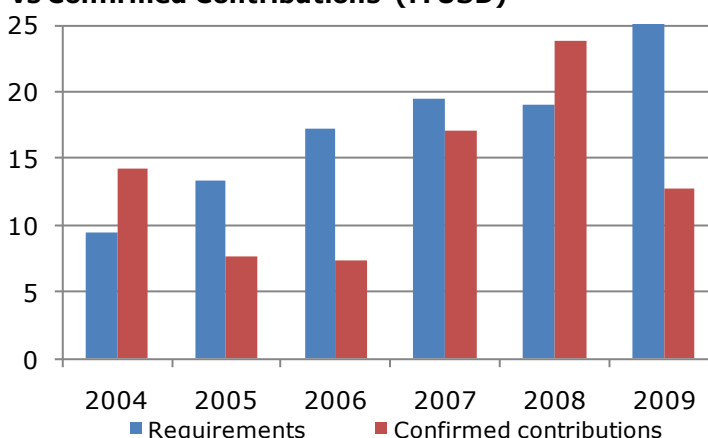
21. The food for education (FFE) component of the current WFP PRRO 10305.1 more recently reached over 20 % of the

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[69] National Strategic Development Plan 2006-2010
[70] WFP Blue Book
[71] Impact assessment of WFP pipeline breaks (Feb-Mar 2007)

country's primary students[72] and accounts for slightly more than half of the PRRO food requirements.

Table 2: Cambodia MoEYS primary schools vs. WFP supported schools (2009-2010)

Province	Total MoEYS primary schools	WFP-assisted schools			Total	%
		SMP only	THR only	SMP+THR		
Banteay Mean Chey	394	5	145	16	166	42%
Kampong Cham	779	24	2	115	141	18%
Kampong Chhnang	255	3	2	100	105	41%
Kampong Speu	305			107	107	35%
Kampong Thom	460	187			187	41%
Odar Mean Chey	159	129			129	81%
Phnom Penh		1			1	
Preah Vihear	175	13	30	6	49	28%
Prey Veng	563	185	25	17	227	40%
Pursat	265	4		38	42	16%
Siem Reap	463	136	93	153	382	83%
Stung Treng	103			30	30	29%
Svay Rieng	212	36		22	58	27%
Grand Total	**4133**	**723**	**297**	**604**	**1624**	**39%**

Figure 2: Map of WFP prjects Area (2007)

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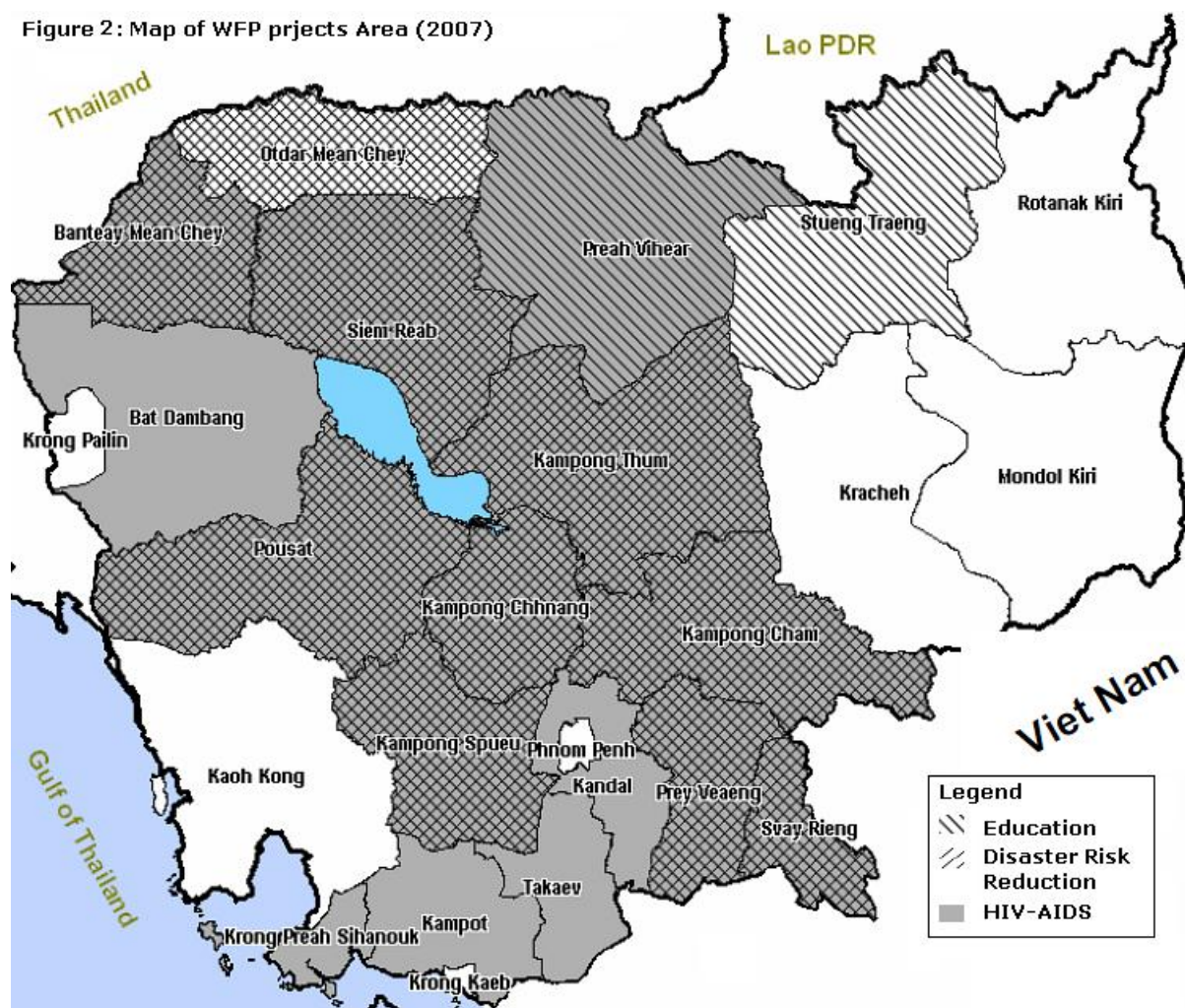
[72] WFP PRRO 10305.1 Standard Project Report (2008)

22. The WFP SMP targets 12 provinces (figure 2) where it currently reaches 16 to 81% of the provinces schools. The PRRO uses three primary education indicators: net enrolment rate, attendance rate and completion rate identified by the IPC. Districts and schools are targeted on the basis of Ministry of Education Youth and Sports data and the remoteness of their location. All children attending targeted schools are entitled to school feeding, but take-home rations is provided for children from the poorest households, especially girls most at risk of dropping out. School directors and cooperating partners assist in selecting beneficiaries.

23. The primary school system has two shifts per day and school meals are offered during the morning shift. There is a rotation system by which students shift from one shift to the other on a weekly or monthly basis. Currently, at any one day, around 70% of WFP's SFP beneficiaries receive school meals. Accordingly, WFP operation plans target 62%).

24. Table 3 presents the rations breakdown by beneficiary category:

Table 3: PRRO 10305.1 food ration

Beneficiary Type	Unit/Feeding days	Ration (Kg)					
		Rice	Fish	Oil	Salt	Beans	Total
School Feeding	1 child / day	0.10	0.02	0.01	0.00	0.03	**0.16**
Take-Home ration	1 child / month	15.00		1.00		2.00	**18.00**
Volunteer (cooks)	1 cook / month	15.00		1.00			**16.00**

Table 4: Children Receiving School Meals – Planned and Actual 2002 - 2008

YEAR	PLANNED			ACTUAL		
	Total	Boys	Girls	Total	% girls	% Actual vs Planned
2002	294,500	154,308	135,770	290,078	47	98
2003	290,078	158,756	141,472	300,228	47	103
2004	316,800	200,737	178,165	378,902	47	120
2005	346,500	285,990	258,306	544,296	47	157
2006	574,200	312,308	283,251	595,559	48	104
2007	615,572	306,394	281,883	588,277	48	96
2008	559,600	242,790	223,226	466,016	48	83
2009	559,600	274,496	253,117	527,613	48	94
Average	444,606	241,972	219,399	461,371	47	107

Source: SPRs for each year

Graph 4: School Meals Beneficiary figures
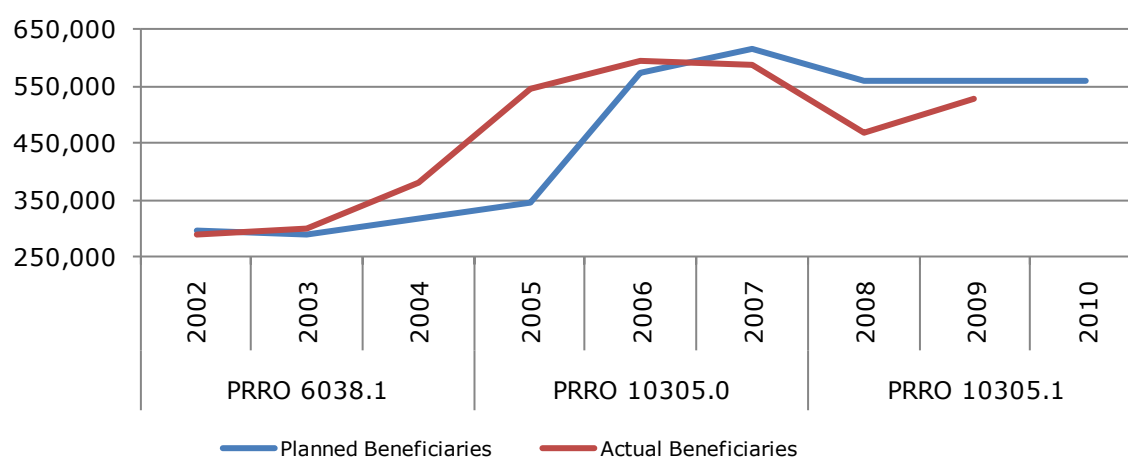
25. WFP School feeding programme increased progressively during the past decade. Graph 1 and 2 show beneficiary trends between 2002 and 2008 for both school feeding and take-home ration.

26. Between 2002 and 2009 the school Feeding Programme increased from 300,000 to near 530,000 beneficiaries at a pace above the project documents' plans. In the more recent years, funding issues seem to explain under achievement of school feeding (graph 4 2008-2009).

27. In the same period, the take home ration component took off more seriously in relative terms and reaches nowadays some 21,000 school children.

Table 5: Children Receiving Take Home Rations – Planned and Actual 2002-2008

YEAR	PLANNED			ACTUAL		% girls	% Actual vs Planned
	Total	Boys	Girls	Total			
2002	1,500	670	845	1,515	56		101
2003	1,515	553	524	1,077	49		71
2004	15,000	2,096	2,216	4,312	51		29
2005	15,000	3,787	8,033	11,820	68		79
2006	15,000	2,559	13,625	16,184	84		108
2007	26,000	3,512	19,546	23,058	85		89
2008	22,000	4,483	22,220	26,703	83		121
2009	22,000	5,194	15,761	20,955	75		95
Average	14,752	2,857	10,346	13,203	69		87

Source: SPRs for each year

Graph 5: Take Home Ration beneficiary figures
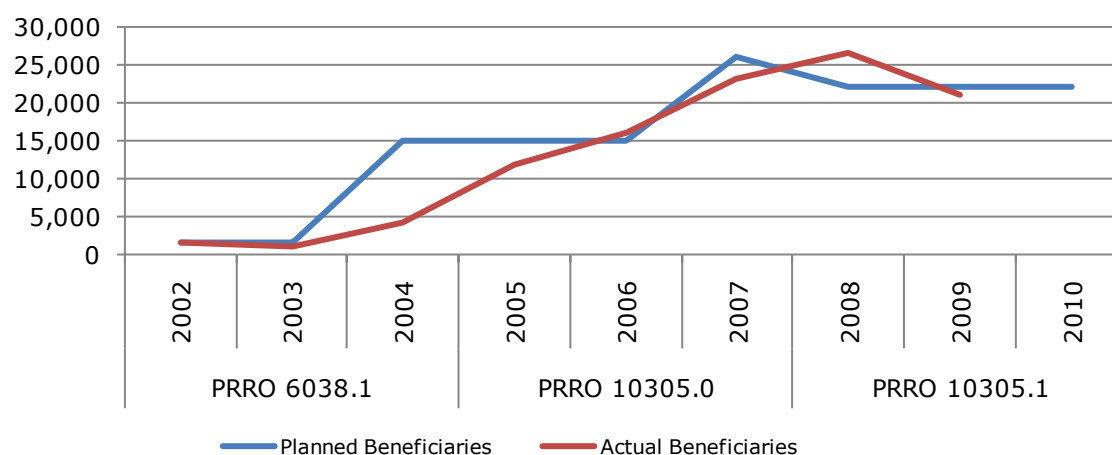
28. While increasing its SF beneficiary figures, the PRROs overall distributions decreased to between 16,000 and 25,000 mt in the past years. This reflects a decrease in contribution and an increase of importance of the SF component in the PRRO portfolio.

Graph 6: Total Planned vs Distributed Tonnage (MT)
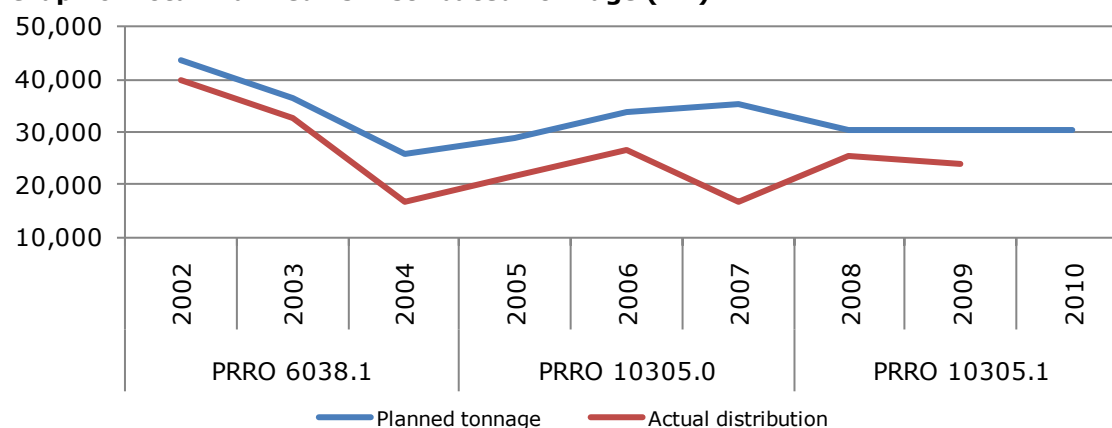
29. The WFP Standardized School Feeding Survey (SSFS) was conducted in 2006, collecting and analysing information on the achievement of the SFP in Cambodia. The results of the survey demonstrated improvements in education achievement in WFP assisted schools as compared to national averages (table 6). It is mentionned that to ensure the high quality of the program, efforts should be made to seek further and strengthen partnerships. One of the biggest challenges to the school feeding programme is to overcome the

Table 6: Core Indicators, SSFS findings (2006)

Indicator	WFP	Non- WFP assisted
Net enrolment rate	92.0%*	90.7%
Attendance rate	97.0%	--
Successful candidate rate Grade 6	91.0% 83.2%*	81.8%
Gender ratio	0.94 0.91*	0.90
Drop-out rate	12.82%*	13.38%
Repetition rate	12.94%*	14.63%

* EMIS 2005-06 at district level (source:SSFS 2006)

barriers that stop children from going to schools: the main reasons for pupils non-enrolment is poverty and parents' negative attitude towards the value of education.

30. WFP collaborates with UNICEF since 2001 through the Child-Friendly School Programme (CFS). UNICEF provides complimentary inputs to WFP school meals and take-home rations, such as capacity building, text books and clean water supply. As of 2006, the collaboration covers half of WFP assisted schools.

31. A WFP evaluation of the PRRO (2009) found that the operation has been implemented at 80%+ of the PRRO approved operational levels for beneficiaries and tonnages since early 2008. Primary enrolment is high and the gap to full enrolment exists because poor HHs enroll children at lower than average levels. This means that enrolment and attendance goals will only be reached if and when the poorest are receiving economic incentives allowing them to send children to school rather than for paid work. THRs result in increased enrolment and attendance while SF does not result in enrolment or attendance gains.

2. Reason for the Evaluation

2.A. *Evaluation Rationale*

32. The Cambodia SMP was selected, based on a mix of criteria such as: - significant duration over which WFP has supported school meals - size of the programmes (very large programmes with 300,000 or more beneficiaries or very small programmes); - a mix of modalities (wet feeding, take-home rations, biscuits, etc.); - timing to maximize synergies with WFP planning processes and efforts to integrate school meals into a larger context of education and social safety nets.

33. The Cambodia Country Office will design the current PRRO follow up intervention in the course of 2010. Findings and recommendations from this evaluation exercise will inform this process. The follow up intervention will be presented at the EB.A JUN 2011 and is planned to start JUL 2011.

2.B. *Evaluation Objectives & Users*

34. Like all evaluations at WFP, this evaluation serves accountability and learning purposes. The evaluation will:

(i) evaluate the outcomes and impact achieved so far from the various modalities that have been used in relation to stated educational, gender and nutritional objectives; and

(ii) evaluate outcomes and impact achieved in relation to WFP's new social safety net policy objectives (even though these were not explicitly included in the programme design) and assess the extent to which the programme has met, or has the potential to meet, these; and

(iii) identify changes needed to enable fulfilment of potential to contribute optimally to Cambodia objectives and the objectives of the current WFP Strategic Plan and 2009 School Feeding Policy.

35. The programmes cannot be held accountable on point (ii) for achievement of objectives that were not included in the programme design. However, some unexpected and/or less

explicit outcomes may already have been achieved towards these objectives. These should be recorded for <u>learning purposes</u>, especially as part of the baseline assessment upon which future strategy and new programme can be designed, in Cambodia and possibly more widely. For this reason - in evaluation jargon – the evaluation will be primarily 'formative', rather than 'summative'.

36. The main intended users for this evaluation exercise are: the WFP Cambodia Country Office, the WFP HQ school meals units (policy & design), the Cambodia Ministry of Education, Sport and Youth. Other users may include other WFP partners and contributors to the education sector in Cambodia: UNICEF, World Bank, ADB and I/NGOs.

2.C. *Key Questions*

Related to MDG's 1, 2 and 3, what impact has WFP's work on school feeding contributed concerning:

a) the efficiency of the education sector and impact on learning achievements;

b) nutritional improvement;

c) economic transfer, food security or physical protection[73] for the most vulnerable, even though these were not intended at the outset

The role of strategy and implementation factors (within WFP's control and/or its partners') – e.g. to what extent have WFP's targeting strategy and school feeding modalities been aligned with Government policy priorities in the education sector?

How does THR and school feeding differ in their impact and costs?

What are the wider linkages with the community through local food procurement? 75% of the food purchased by WFP in 2009 was procured locally.

3. Parameters of the Evaluation

3.A. *Scope & Limitations*

For assessing **effectiveness**, the evaluation will consider information concerning all operations that have included a school feeding component in the 10-year period from 2000 through 2009, with emphasis in the past 5 years[74]. For assessing **efficiency**, information will be drawn primarily from the 5-year period 2005-2009.

3.B. *Stakeholders in the Evaluation*

A preliminary stakeholder analysis is presented in annex 3. Stakeholders include a range of WFP units, Government of Cambodia, UN partners, development banks, I/NGOs partners. The main common issue to stakeholders is a fear of phasing out or reduction of the current SFP in Cambodia, while a main expectation will be expansion of programme.

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[73] e.g. protecting girls from early marriage
[74] The 2006 SSFS may be used as a baseline for the purpose of this evaluation.

The WFP policy unit and the World Bank have a particular stake in this evaluation as they are in the design stage of an school feeding impact evaluation cash vs food to be conducted in 2011. Findings from this evaluation may complement and inform their evaluation design.

4. Evaluation approach

4.A.   *Evaluability Assessment*

Evaluability *is the extent to which an activity or a programme can be evaluated in a reliable and credible fashion. It necessitates that a policy, intervention or operation provides: (a) a clear description of the situation before or at its start that can be used as reference point to determine or measure change; (b) a clear statement of intended outcomes, i.e. the desired changes that should be observable once implementation is under way or completed; (c) a set of clearly defined and appropriate indicators with which to measure changes; and (d) a defined timeframe by which outcomes should be occurring.*

   Until 2009, WFP did not have a formally adopted "logical framework for school feeding" presented in one document. However, the WFP Strategic Results Framework gives important guidance under Strategic Objective 4 Reduce Chronic Hunger and Undernutrition, for which Outcome 4.2 concerns school feeding directly. The 2009 WFP School Feeding Policy includes a logical framework which carries forward indicators previously used for education and nutrition outcomes[75] and adds more - see Annex 4 of these TOR.

37. The two PRROs for the period from 2004 to now include traditional WFP educational objectives of increased enrolment and retention, decreased repetition and reduced short-term hunger.

   Educational Outcomes.   The country office has a rich data base of education information per year on WFP-assisted schools. This data is collected by the MoESY. This data set may prove useful when analysing change overtime in WFP-assisted schools and non-assisted schools since 2000.   EMIS data reliability will be carefully considered. Furthermore, the 2006 SSFS can be used as a baseline.

Finally, there are possibilities to constitute a comparison group (a group of people with similar characteristics as current beneficiaries but not being assisted by WFP) in the provinces where WFP school feeding is being implemented.

   Nutritional Outcomes. Limited information is available on nutrition issues for school aged beneficiaries. The latest UNICEF MICS is dated 2000. There is a study dating from the 1990' about anaemia and school aged children which might be useful to consider, particularly from a methodological point of view.

   Value Transfer Outcomes. Likewise, limited information is available on school aged children or households with school age children. The value transfer outcomes provide a challenge in that WFP has only very recently adopted this objective for school feeding. The team will use the new logic model in the new WFP School Feeding Policy (2009) as far as possible to guide the evaluation in generating evidence of unplanned results already achieved

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[75] In the Indicator Compendium (2006-7), 2005, and the 2007 study *Food for Education Works: A Review of FFE Programme Monitoring and Evaluation 2002-2006*, Aulo Gelli for WFP. The latter was commissioned by WFP, although never formally adopted. It also presented a logic model and programme theory.

and assessment of future potential. This is not 'evaluable' for accountability purposes, but can be used for learning purposes.

4.B. *Methodology*

Mixed Methods. This impact evaluation takes a mixed methods approach, which makes optimum use of evaluation resources and possibilities to support evaluative assessments and show developments over time in order to provide evidence for well-informed decision making in as timely a manner as possible. In the longer term, the approach to impact evaluation will be broadened to include longitudinal and quasi-experimental studies as well. It will draw on the body of existing data and research as far as possible.

The approach has four 'legs' (main methods), which complement each other. Data from the 'legs' will be systematically triangulated to verify and deepen insights. The combination and balance between these four different methods will be decided by the Evaluation Team in the Inception Phase, selected as appropriate to purpose and context. They are: desk review of existing literature and stakeholder interviews to establish and assess the institutional logic of the programme, implementation strategies and allocations of resources; review of literature and secondary data; quantitative survey(s) among beneficiaries and schools, as necessary to complement existing data and ensure the evaluation team can answer the evaluation questions; and qualitative field interviews among beneficiaries and all key stakeholders. The qualitative interviews seek to deepen the understanding and analysis of the data generated by the other methods and to add substance to the indicators. Qualitative methods will include semi-structured interviews, focus group discussion, and observation. Participatory methods will be used with those intended to benefit from the programme (school children and their households) and with those most closely involved in implementation (e.g. in schools and WFP staff). Some form of tracer study of previous beneficiaries is also likely to be appropriate.

Survey sampling will be representative and randomised. The evaluation will seek comparative data with schools in similar settings, which have not received school feeding (a comparison group).

The focus for qualitative field work will be carefully selected during the Inception Phase by the team in consultation with the Evaluation Manager and Country Office, based on the most important data gaps undermining the team's ability to answer the evaluation questions. The primary data collection will take place in MAY 2010, prior to the evaluation mission.

38. **Using Standards.** The evaluation will use established standards to assess WFP's performance. In some areas, the standards may have been set by WFP, as it is the largest player in the school feeding area. In other areas, standards are not yet defined and the evaluation team will analyze and evaluate the working tools that WFP has developed to determine whether these tools meet professional standards. The 2009 School Feeding Policy sets 8 'Standards Guiding Sustainable and Affordable School' with indictors. The World Bank has set standards concerning social safety nets. The Focus Group will consider these and assess which standards should be used.

Evaluation Matrix. In the inception phase the evaluation team will develop an evaluation matrix that expands the key questions and articulates sub-questions, verifiable indicators to respond to these, and means of verification/data collection.

4.C. Evaluation Quality Assurance

WFP has developed an Evaluation Quality Assurance System (EQAS) based on international good evaluation practice. It sets out process maps and templates for evaluation products as well as checklists for feedback on quality for each of the evaluation products. This quality assurance does not interfere with the views and independence of the evaluation team, but ensures that the evaluation is systematically based on clear and convincing evidence and presented clearly and logically.

The evaluation team will be required to ensure the quality of data used in the evaluation report is checked for validity, accuracy and reliability. The evaluation report will clearly indicate limitations to the conclusions that can be drawn from the evidence.

In addition, the evaluation will benefit from an external peer review panel, which will review and discuss (by video/telephone conference and/or by email) the draft Inception Report and draft Evaluation Report. The panel will be composed of professionals with experience in school feeding, nutrition and (possibly) social safety nets/social protection.

4.D. Phases and Deliverables

The evaluation will take place in five phases with timing as shown in Table 7 below:

(i) **Design phase** is to establish and agree on the terms of reference, identify the evaluation team leader and team members, establish the reference group and peer review panel, and compile background information and relevant documents for easy access of the evaluation team during the next phase.

(ii) **Inception phase** is for the evaluation team to arrive at a common understanding of the terms of reference, review documentation, develop an evaluation matrix accordingly, decide on the methodologies to be used during the evaluation and site selection for field work, assign division of responsibilities in the team and determine the logistics arrangements for field work and the timetable for delivery of the evaluation report. This phase will include a team leader briefing in Rome at the end of APR 2010 and an inception mission in MAY 2010 (see timeline below). This will be captured in a brief inception report

Table 7: Phases and Deliverables for the Evaluation

Phase	Timing	Expected Outputs
1. Design Phase		
Preparation of draft TOR by OE	MAR 2010	
Circulation of TOR for review	01-12 APR 2010	Improved draft of TOR
Clearance of TOR by Dir, OE	13 APR 2010	**FINAL TOR**
Team selection & contracting	23 APR 2010	**Team assembled**
2. Inception Phase		
Preliminary desk review of literature by team	23 – 30 APR 2010	

Phase	Timing	Expected Outputs
Team Leader joint meeting	26 – 29 APR 2010	
Inception Mission	18 – 25 MAY 2010	Draft Inception Report (see separate template)
OE quality assurance & report revisions	26 MAY 2010	Revised draft Inception Report
Circulation of IR for review by Ref Group & Peer Reviewers	27 MAY – 03 JUN 2010	
OE consolidates comments	04 JUN 2010	Comments matrix to TL
TL revises IR	04 JUN 2010	
Clearance of IR by Dir, OE	04 JUN 2010	**FINAL INCEPTION REPORT**
3. Evaluation Phase		
Conduct quantitative studies	04 – 11 JUN 2010	Survey Report
Field work	14 JUN – 30 JUL 2010	Team members' reports
TL debrief on progress	30 JUN 2010	Aide memoire
4. Reporting Phase		
TL drafts evaluation report	01 JUL – 30 AUG 2010	
OE quality assurance & report revisions	01 SEP – 20 SEP 2010	Revised draft Evaluation Report
Circulation of ER for review by Ref Group & Peer Reviewers	20 – 30 SEP 2010	
OE consolidates comments	30 SEP 2010	Comments matrix to TL
TL revises ER	01 OCT – 14 OCT 2010	
Clearance of ER by Dir, OE	15 OCT 2010	**FINAL EVALUATION REPORT**
5. Executive Board (EB) and Follow-up		
Preparation of Management Response	15 – 30 OCT 2010	Management Response
Presentation of Summary Evaluation Report & Management Response to EB	EB.1 FEB 2011	
Preparation of Evaluation Brief & dissemination of report	15 FEB 2011	
Note: School holidays from mid-JUL to SEP.		

5. Organisation of the evaluation

5.A. Evaluation Team

The *team leader* for the evaluation requires strong evaluation and leadership skills and technical expertise in one of the technical areas listed below. His/her primary responsibilities will be (a) setting out the methodology and approach in the inception report; (b) guiding and managing the team during the inception and evaluation phase and overseeing the preparation of working papers; (c) consolidating team members' inputs to the evaluation products; (d) representing the evaluation team in meetings with stakeholders; (e) delivering the inception report, draft and final evaluation reports (including the Executive Board summary report) in line with agreed OE standards (EQAS) and agreed timelines. The full job description is provided separately.

The *evaluation team members* will bring together a complementary combination of technical expertise in the fields of education, nutrition, social safety nets, food security, economics and gender. The team leader will be internationally recruited. The remaining team members will be a mix of international and national recruitment. The blend of technical areas across the team will depend on that of the team leader first. At least one team member should be familiar with WFP's work in general.

The evaluation team members will contribute to the design of the evaluation methodology in their area of expertise; undertake documentary review prior to fieldwork; conduct field work to generate additional evidence from a cross-section of stakeholders, including carrying out site visits, as necessary to collect information; participate in team meetings, including with stakeholders; prepare inputs in their technical area for the evaluation products; and contribute to the preparation of the evaluation report. The full job descriptions are provided separately.

All members of the evaluation team will abide by the Code of Conduct for evaluators (attached to individual contracts), ensuring they maintain impartiality and professionalism.

5.B. Roles and Responsibilities

Reference Group. The evaluation manager will set up an advisory reference group composed of WFP stakeholders (from school feeding units in the Policy and Programme Support Divisions, the regional bureau and key staff in the country office) and key partners in programme implementation. The purpose of the reference group is to serve as a sounding board for early feedback on key evaluation products (e.g. the TOR and evaluation report), according to the communication milestones shown above.

WFP Country Office will also (i) provide access to information that is necessary to prepare and conduct the evaluation; (ii) be available to the evaluation team to discuss all aspects of the school feeding programme that the evaluation team considers relevant; (iii) facilitate the evaluation team's contacts with stakeholders; (iv) administratively support the contracting of Cambodian consultants selected by OE for the evaluation team and/or to conduct tracer studies, who will report to the Team Leader and OE; and (v) arrange in-Cambodia meetings and field visits, and provide logistical support during the fieldwork. The WFP Cambodia Education Unit is the primary focal point for information and logistics issues.

WFP HQ and Regional Bureau staff will also be available for discussion with the evaluation team and provide information.

Evaluation Manager. The evaluation will be managed by Michel Denis, Evaluation officer in OE of WFP. The evaluation team leader reports to the evaluation manager, who has the following responsibilities: (a) manage the process of sharing the draft terms of reference with stakeholders to obtain comments and revise the terms of reference; (b) identify and recruit the evaluation team leader and in consultation with him/her identify and recruit evaluation team members; (c) identify and set up the reference group and peer review panel; (d) organize all communications between the evaluation team and other stakeholders (WFP, reference group, etc.); (e) manage collection of documentation from within and outside WFP and make this information available to the evaluation team in an organized way (see Bibliography at Annex 4); (f) review and exercise first level quality assurance on the evaluation products (inception report, tracer impact study reports, evaluation, and EB summary report); (g) manage the evaluation within the given budget and time.

Director, OE. The evaluation manager reports directly to the Director, OE, who will provide second level quality assurance and guidance on evaluation or technical issues, as required.

5.C.   Communication

The evaluation will ensure communications at several milestones in the form of distributing and discussing: (a) the draft terms of reference; (b) the draft inception report; (b) briefing for the WFP Country Office and key partners at the beginning and end of the fieldwork; (c) the evaluation report. In addition, the evaluation results will be incorporated into OE's new lessons' sharing system, once it is established (to come on-stream in 2010) to ensure lessons will be accessible to users in and outside WFP.

5.D.   Budget

The evaluation will be funded from OE's Programme Support Budget. Details are in development pending final agreement on methodology.

B. Bios of Team Members

Nicolai Steen Nielsen (Education Expert and Team Leader)

Nicolai Steen holds an Advanced Degree in International Relations and a M.A. in International Development Studies and Education. He has worked with development and humanitarian aid Africa, Asia and Latin-America since 1997 and represents solid experience, primarily within development modalities, decentralisation and local governance, civil society, education and humanitarian assistance and the humanitarian reform process. Assignments are typically carried out in the areas of evaluations, reviews, programme formulation, appraisals, surveys as well as thematic studies.

He has worked on different assignments within private consulting, performing as international consultant on long-term implementation assignments and short-term consultancies for different multilateral organisations (WFP, UNICEF, OECD & World Bank), bilateral donors and agencies (AECID, Danida, Dfid and SIDA) as well as NGOs (Ibis, MS-Action Aid, Red Cross Spain and ADRA). Furthermore, he has also performed as director/coordinator of international consortia, recently in the area of disaster risk reduction.

Kate Godden (Nutrition Expert)

Kate Godden is a Food Security & Nutrition adviser who has worked in the humanitarian and development sectors since 1990. She has a MSc from the London School of Hygiene & Tropical Medicine, and is registered with the UK Nutrition Society as a Public Health Nutritionist. She has worked in many countries internationally, but also in the UK, carrying out consultancy work for DfiD, UN agencies and NGO's largely conducting needs assessment, reviewing proposals and running independent evaluations. She offers skills in mixed method evaluations including survey design, implementation & analysis and qualitative methods.

She is a member of the following professional organizations (The UK Nutrition Society, The Capacity Development Working Group of the UN Global Nutrition Cluster, ALNAP (active learning network for accountability and performance in humanitarian action) of the ODI and The NIETN (nutrition in emergencies training network). She also works at the University of Westminster where she runs courses on Food Security, International Nutrition Programme Planning and Nutrition in Emergencies.

Pierre Leguéné (Economist and Value Transfer Expert)

Pierre Leguéné is an agro-economist, expert in food security, livelihoods and rural development, with 13 years of experience in Latin America, Africa, South East Asia and Middle East. He has a solid track as food security programme manager with various I/NGOs, among which CARE International, Action against Hunger and Oxfam and since 2007 he works as an independent consultant. Pierre has significant experience in strategic analysis, operational response and team management, skills developed as Head of food security department in AAH between 1999 and 2002. He has acquired in-depth knowledge of international donor strategies, procedures and practices (DG ECHO, WFP, FAO, UNHCR, DFID, BPRM, OFDA and bilateral agencies). Pierre has solid experience on vulnerability analysis and food aid implementation, monitoring and evaluation and has carried out

assessments and evaluations in almost 30 countries in Latin America, Africa, Middle East and Asia in emergency, post emergency, development contexts and is particularly familiar with Linking Relief Rehabilitation and Development approaches and analysis. Among his working experience, he has also developed expertise in gender analysis, environment, institutional support, safety nets and participatory approaches.

Daniela Ruegenberg and Jesper Rüdiger (Econometricians)

Daniela Ruegenberg has worked for more than 7 years as researcher and quantitative analyst. She has worked on projects such as the "Thematic Study on Aid Effectiveness and Development Effectiveness" of the Paris Declaration, and she is actively involved in the development of the Humanitarian Response Index, as well as other quantitative and analytical assignments at DARA, including a Disaster Risk Reduction Initiative. She has also participated in evaluations and assessment missions in Bangladesh, and Somalia/ Kenya. Prior to DARA, she worked in the area of economic development, monitoring and tracking systems of different projects in Bolivia. Daniela holds a BA in Economics from Universidad Católica Boliviana (La Paz), a MA in Development and International Aid Studies from Universidad Complutense (Madrid), and is trained in humanitarian aid evaluation (Brussels).

Jesper Rüdiger has a master in economics with training in micro-econometrics and programme evaluation. He is PhD-candidate on decision theory and experimental economics at Universidad de Carlos III in Madrid, where he also teaches econometrics and mathematics. He has previously worked on an evaluation of the Spanish foreign aid and a climate risk reduction index.

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D. List of Individuals/Organisations Interviewed

date of interview	place	interviewees	organisation or institution
Pre-Mission			
19/05/10	Phnom Penh	key staff at WFP -CO	WFP
		Director for Primary Education and school feeding focal point	Ministry of Education
		staff members	CDRI - Cambodia Development Resource Institute
		staff members	EIC - Economic Institute of Cambodia
20/05/10		key staff at WFP CO	
		staff from partner NGOs	
21/05/10		staff members	Australian Embassy
		Director	KAPE (Partner NGO)
		Staff	FSC
		staff members	UNICEF
		Staff members	ADB
24/05/2010	Sangkum Seksa primary school, Odong district, SKP	pupils, teachers and parents	
	Phnom Penh	Staff member	World Bank
		Staff Department of Planning	Ministry of Education
		WFP - CO Nutrition	
		staff members and director	Hellen Keller International
25/05/2010	Phnom Penh	internal work	WFP
		debriefing	WFP
		director	Hellen Keller International
		team departure	
25/05/10 - 29/05/10		survey specialist working with CO and Hellen Keller International	WFP/Hellen Keller International

date of interview	place	interviewees	organisation or institution
Evalauation Mission			
10/06/2010	arrival team members - briefing	WFP CO	
	Phnom Penh	staff	World Vision
11/06/10	Phnom Penh	Programme Manager of IDPoor Programme and GTZ technical assistant	Social Planning Department, Ministry of planning
		Coutry Director, Programme Officers	Helen Keller International
		Country Director, Head of Programmes	WFP Country Office
		Staff Member	KAPE (Partner NGO)
		Programme Manager - School Feeding	WFP Country Office

14/06/10	Prey Veng province, district Kanh Chriech, school Prey Tbal, village Prey Tbal	Men focus group	
14/06/10	Prey Veng province, district Kanh Chriech, school Prey Tbal, village Prey Tbal	Women focus group	
14/06/10	Sramar Kako school, Paraing district, Prey Veng province	Head of Nutrition Programme and one survey team	Helen Keller International
	Sramar Kako school, Peraing district, Prey Veng province	School Principal, school cluster Director of Child friendly Schools	
	Prey Veng, Provincial Health Department.	Provincial Health Director, Nutrition focal point for PV	Ministry of Health, PV
	Prey Veng,	Child health officer	RACHA NGO
15/06/10	Prey Veng province, district Peam Rain, school Prey Srolet, village Prey Srolet	Village chief and 4 men	
15/06/10	Prey Veng Province, district Peam Rain, school Kouk Touch, village Kouk Touch	Individual households interviewed separately	
15/06/10	Prey Veng province	Agriculture department officers	Agriculture Provincial Department
	Prey Veng province, district Peam Rain, school Prey Srolet, village Prey Srolet	School Director, Director of Education focal point, Director of school cluster	School staff and Ministry of Education
	Prey Veng province, district Peam Rain, school Prey Srolet, village Prey Srolet	Group of 8 women from the village	
16/06/10	Prey Veng province, district Kamchay Mear, school Toursenchey, village Trapang Danghit	Individual households interveiwed separately	
16/06/10	Prey Veng province, district Kamchay Mear, school Anchanh, village Anchanh	Village chief and men focus group	
16/06/10	Prey Veng province, district Kamchay Mear, school Anchanh, village Popel	Women focus group	
	Prey Veng province, district Kamchay Mear, school Anchanh, village Popel	School Director Director of Education focal point	School staff and Ministry of Education
	Prey Veng province, district Kamchay Mear, school Anchanh, village Popel	School pupils	
	Prey Veng province, district Kamchay Mear, school Prey Tamok	School pupils	
	Prey Veng province, district Kamchay Mear, school Toul Senchey	School Director	
17/06/10	Prey Veng province, district Mesang, school Prey Rumdeng, village Prey Rumdeng	School director and deputy school director	

17/06/10	Prey Veng province, district Mesang, school Prey Rumdeng, village Prey Rumdeng	Individual households interveiwed separately	
	Prey Veng province, district Prasat Bakorng, Wat Rolous school	Group discussion with villagers and school staff	
18/06/10	WFP sub office, Siem Reap	Sub office staff	WFP
	Siem Reap	RACHA Assistant provincial co-ordinator, MCH programme partner	RACHA NGO
	Siem Reap, Caritas offices	Programme Manager	Caritas
18/06/10	Siem Reap province, district Banteay Srer, school Skun, village Skun	Individual household	
18/06/10	Siem Reap province, district Banteay Srer, school Skun, village Skun	School Director, District education focal point, 2 teachers, school support committee, village chief	
18/06/10	Siem Reap province, district Banteay Srer, school Skun, village Skun	Village chief and deputy chief	
19/06/10	Siem Reap province, district Sotnikum, school Phkar Rumchek, village Phkar Rumchek	Women focus group	
	Siem Reap province, district Sotnikum, school Phkar Rumchek, village Phkar Rumchek	School Director and teachers	
21/06/10	Siem Reap province	Provincial director and 1 officer	Agriculture Provincial Department
	Siem Reap, FAO sub office	Provincial co-ordinator	FAO
	Siem Reap province, district Pouk, school Kcheay, village Kcheay	Individual households interveiwed separately	
	Siem Reap province, district Pouk, school Kcheay, village Kcheay	Women focus group	
	Siem Reap province	Provincial deputy director and 2 officers	Provincial Deparment of Labour and Vocational Training
22/06/10	Siem Reap province, district Svay Leu district, Trapaing Svay school	School Director and teachers	School staff and Ministry of Education
23/06/10	Phnom Penh	Ministry of Interior Secretary of State, Chair of CARD	Council for Agriculture and Rural Development (CARD), Safety Net National Strategy
	Phnom Penh	WFP MCH programme manager	WFP
24/06/10	Phnom Penh	VAM unit assistant	WFP
	Phnom Penh	WHO Child survival officer and acting head of MCH programme	WHO
	Phnom Penh	UNICEF Nutrition specialist	UNICEF
	Phnom Penh	National Council of Nutrition.	National Council of Nutrition, Ministry of Planning
	Phnom Penh	National Nutrition Programme	Ministry of Health
25/06/10	Phnom Penh	WFP CO	
		Debriefing	WFP CO

E. Detail on Methodology - Including the Evaluation Matrix

This impact evaluation uses a mixed methods approach involving the collection of both quantitative and qualitative information. Quantitative data was collected via a large scale survey based on 2,000 households. The survey design is a case control and uses a stratified randomised sampling methodology. The qualitative information is intended to complement and support the survey data. The methods and tools used are described below.

Household Survey
The population eligible to participate in the survey were children that attend forth to sixth grade in primary school and their mothers. This group has been chosen because children of primary school are targeted for receiving school meals (SMP), and the most vulnerable for receiving take home rations (THR). Students in forth to sixth grade are qualified to receive both SMP and THR, and they can recall foods consumed throughout the day more easily (most importantly the foods consumed at school).

Household participation in the survey is based on the enrolment of children in forth to sixth grade. The selection of the child was done at the school level.

It is mainly the mother of the child and the child his/herself who was surveyed. In the case in which the mother was not in the house, the father was also able answer the questionnaire along with his child. If neither the parents nor the selected child were at home, the interview was either re-scheduled (best option), or replaced by another household that had been previously chosen as a replacement.

Selection of household survey sample

Stratified Random Sampling. The data was chosen as a mixture of the following strata:

- *SF programme*: Either SMP only, THR only, or both programmes in one school.

- *Level of Vulnerability (VAM) in province*: Two provinces were chosen according to their level of vulnerability, as determined by the VAM. Siem Reap was chosen for high vulnerability with respect to food security, and Prey Veng was chosen for being particularly prone to floods and droughts

- *Presence of the Child Friendly School-programme (CFS), UNICEF as partner*

- *Shifts*: We have focused on schools with one versus two shifts, although a few schools with three shifts exist.

Steps in the sample selection:

1. **Intervention schools**. Intervention schools were chosen by isolating the relevant group in the sample and then choosing schools randomly (using a random number generator to order the schools, and then choosing based on this random order).

2. **Control schools**. There are two types of control groups: (i) schools were chosen specifically to match the intervention schools in the SMP and (ii) within THR schools, a set of non-beneficiary students were chosen. Since we intended to use matching-type estimators, the selection of the control group was done using a propensity score approach:

a. Propensity scores: First the propensity to participate in SMP based on the data available in the MoEYS database (excluding outcome variables such as attendance and progression rates) was calculated for each school.

b. Within-district matching. To take account for unobservable regional characteristics, the control group schools were chosen, for each intervention school, to be the non-SF school in the same school district with the closest propensity score.

3. **Criteria for selection of households**: (a) At the intervention schools and non-intervention schools (control groups), the surveyor randomly selected 20 students in forth to sixth grade from the overall enrolment lists (even if the school had two shifts). Another 5-10 students were chosen to prevent drop outs. (b) At the THR-only and THR and SMP schools, the surveyor randomly selected 20 THR students (or all of them if the school had less than 20 – the MoEYS database provided this information, and it was given to the survey team in advance).

4. **Quality control**. A quality assurance visit was made at the start of the household survey to check the equipment and to ensure procedures and hygiene were being adhered to particularly in relation to the disposal of the 'sharps' following the pin prick blood taking. Ethical clearance for this procedure was obtained prior to start of the survey in Phnom Peng.

Sample size and selection of strata: This was defined using the standard confidence interval approach with a normal distribution approximation of a binomial distribution with p = 0.5. Given that we were sampling several variables (enrolment rates, progression rates, nutritional impact, economic factors etc.), the most conservative value of p was chosen for the sample calculation. The formula for a 95% confidence interval in this case is approximately:

This gives a sample error of

Thus for a sample error of 5 to 10 percentage points, an estimate of the required sample size is 100 to 400 households per strata, if the data are independent. Since the households are clustered at the school level this most likely introduces more error in the sample. Choosing 100-200 households per strata we believe to be within a reasonable margin of error (the strata with smaller samples are those with smaller populations).

Survey Questionnaire

A questionnaire containing nine different components distributed in different modules was applied during the survey (see end of Annex D for complete Questionnaire). The components were based primarily on previously used questions and topics from the Cambodian Demographic Health Survey, the Cambodian Anthropometric Survey and other recently used

and validated instruments that have been adapted to Cambodia. The modules were as follows:

Module A and B: household characteristics
This module includes basic demographic questions regarding household size, education level, number, age, and other general background information. This module also includes information about the people who have lived in the household previously (module B). This section was thought for the evaluation team to identify these members and run tracer-studies in order to assess the long term effects of the program, but due lack of responses it was not feasible.

Module C: Education
This module addresses children and other family members' level of education, their perception of education in general and their perception of SMP (or THR) as an incentive to keep children in school.

Module D: Dietary Diversity
This module contains questions using a 24 hour individual dietary diversity score, usage of the school meals, the nine item Food Insecurity Access Scale and questions commonly used by the WFP for assessing food insecurity.

Module E: Anthropometry, Haemoglobin and Sanitation
Anthropometry: One child per household the one randomly selected at school had his/her weight and height/length measured and recorded by enumerators trained in accordance with proper anthropometric techniques. *Hemoglobin*: Hemocue kits were used to measure hemoglobin. The module also includes questions on sanitation and hygiene practices as well as the household source for drinking water and disposal of feces.

Modules F and G: Economic situation and household Assets

Module F collects data on households' general economic situation and assets. The sample data allow the evaluators to determine the effect of value transfers (especially THR) has on the household economy and also probe targeting issues.

Module H: household Food Security

The household food security module will assess the type and quantity of food. The purpose is to estimate the share of school meals or THR of food intake at household level – and thereby estimate to what extent it contributes to the household´s general food security.

Module I: Other effects of School Feeding

This component addresses other areas that may influence the results of the SFP and its possible relations or causalities in terms of effects at household level (including value transfer hints).

Survey teams
The survey teams were recruited by Helen Keller International to conduct this survey. In order to assure quality work, the counterpart hired individuals with previous field survey experience and provided close supervision and technical guidance during data collection. The survey teams attended a five-day training on survey objectives and methodology, interviews, anthropometry measures, hemoglobin measurement and field practices. The training was conducted by the counterpart. There were four survey teams and each team consisted of 10 interviewers, two anthropometry and blood collection technicians and one field supervisor. Each of the 10-member survey teams interviewed an average of four

households per day and spent approximately two hours at each household including traveling time to each household in different villages. One monitor worked with each survey team to facilitate and supervise the sampling selection and data collection processes. The field supervisor was also involved in checking and editing the questionnaires before leaving the village.

Data entry, cleaning/checking

The database management team oversaw and entered all collected data. A data builder program was used to develop a data entry sheet; this sheet links to a data entry station and SPSS. The counterpart ensured the quality and consistency of the data through double entry of the collected data.

In order to maintain data quality, the counterpart reviewed the raw data before providing it to DARA for the analysis. All irregularities were cross-checked with the survey team for clarification and correction, when necessary.

Table 1: Household Survey Sample Design

Province	Child Friendly School – activities			No Child Friendly School – activities						Total
Prey Veng										
Strata	SF only 2 shifts	Control pscore SF 2 shifts			SF only 1 shift	THR	Control pscore SF 1 shift			
Number of schools	10	10			10	10	10			50
households Students chosen for the household sample	200 SMP beneficiaries	200 More similar to SMP students 1shift			200 Students with SMP	200 Students with THR	200 More similar to SMP students 1shift			1000
Sample name	S2	C2			S1	T1	C1			
Siem Reap										
Strata			SF only 1 shift	SF only 2 shifts	THR	SF+THR	Control pscore SF 1 shift	Control pscore SF 2 shifts		
Number of schools			10	10	10	10	10	10		60
households Students chosen for the household sample			100 Students with SMP	150 Students with SMP	200+100 Students with THR+ Control group	200 Students with both SMP+THR	100 More similar to SMP students 1shift	150 More similar to SMP students 1shift		1000
Sample name			S1	S2	T1	T2	C1	C2		
TOTAL SCHOOLS										110
TOTAL HOUSEHOLDS										2000

School Data Collection

A local NGO, Kampuchean Action for Primary Education(KAPE), was contracted to run surveys at school level. The purpose of this survey was to assess attendance, pupils' consumption at school level as well as pupils' performance. KAPE is an NGO familiar with the education sector and an implementing partner of WFP in some districts[76].

Attendance

The attendance part included head-counting on the day of the survey and comparison of data with schools' own attendance records and, in the case of targeted schools, WFP's log-books for food consumption which is based on daily attendance records. Due to irregularities in the collection of data, different attendance records were randomly used (official and unofficial) and we were, therefore, not able to use the attendance records for the impact evaluation.

School-level Consumption.

We decided to focus on school-level in order to be able to estimate outputs in terms of food consumption per pupil (distribution figures would not give enough precision on consumption as it would not cater for eventual losses or damages on food). The consumption estimate was done by dividing number of pupils attending a school at selected dates with the amount of food that was prepared on those dates. These figures are nearby estimates for two reasons; (i) the amount of food to be prepared is calculated on the basis of the attendance records from the day before and there may, therefore, be some variation in figures and (ii) the exact amount of food that each pupil consumes is a rough estimate as each portion is not weighted before given to the child. Consumption figures are only average figures, but certainly more precise than distribution figures.

Pupils´ Performance Tests

The purpose of the performance test was to evaluate outcome levels (impact according to WFP school feeding policy indicator) establishing the counterfactual between targeted and non-targeted schools.

Pupils' performance test was carried out both at targeted schools and control schools among selected schools (see table 1 above). The test was carried out among grade six students using a standardised test[77]. The table below shows the schools that were selected for the performance test.

Table 2: List of schools included for performance test

School	Strata	Province	CFS	Name of School
17090101001	S1	Siem Riep	-	Kauk Chann
17100506037	S1	Siem Riep	-	Hun Sen Anhchanh
17100403021	C1	Siem Riep	-	Wat Damnak
17100905032	C1	Siem Riep	-	Krasaing Rolaing
17100107004	C1	Siem Riep	-	Akouwat Koroukosal
17110203005	S2	Siem Riep	-	Samaki

[76] Despite being a partner of WFP, results from the school based survey did not reveal any bias in the organizations work during the survey.

[77] The reason why we chose to run the test was that despite having a standardized test, there are no authorities in the country applying the test systematically and results are administered locally and not centralised. Furthermore, in order to ensure that tests results are comparable with schools included in the sample, hence avoiding eventual bias, we decided to run the tests at selected schools of the survey.

17090909037	S2	Siem Riep	-	Anlung 2
17130406008	S2	Siem Riep	-	Trapaing Svay
17070802024	S2	Siem Riep	-	Mouk Pen
17110508021	S2	Siem Riep	-	Trapaing Prei
17041005042	S2	Siem Riep	-	Russey Lork
17111004041	S2	Siem Riep	-	Phkar Rumchek
17110410018	C2	Siem Riep	-	Tuol Ta Phlong
17090807030	C2	Siem Riep	-	Wat Roluos
17110401015	C2	Siem Riep	-	Wat Sdei
17041206051	C2	Siem Riep	-	Samaki Ekpheap
17110404016	C2	Siem Riep	-	Wat Khlaing
14010806031	S2	Prey Veng	Yes	Thlork
14020404015	S2	Prey Veng	Yes	Krabao Thmei
14020111001	S2	Prey Veng	Yes	Cheach
14090409013	S2	Prey Veng	Yes	Kampong Ba Srei (A)
14030408014	S2	Prey Veng	Yes	Samrong
14020410014	S2	Prey Veng	Yes	Anhchanh
14080913045	S2	Prey Veng	Yes	Chrey
14031107052	S2	Prey Veng	Yes	Prey Maoas
14040512018	S2	Prey Veng	Yes	Kauk Kong Lech
14010404015	S2	Prey Veng	Yes	Trung Kla
14080709030	C2	Prey Veng	Yes	Sramar Kako
14030602046	C2	Prey Veng	Yes	Prey Thom
14030207005	C2	Prey Veng	Yes	Pichy Rath
14090304011	C2	Prey Veng	Yes	Boeung Daul
14030311044	C2	Prey Veng	Yes	Thneung
14080911041	C2	Prey Veng	Yes	Preah Malou
14030309008	C2	Prey Veng	Yes	Serei Sar Pich
14081004048	S1	Prey Veng	No	Peam Ampil
14070801023	S1	Prey Veng	No	Prey Kandieng
14080107003	S1	Prey Veng	No	Khsam Cheung
14101004037	S1	Prey Veng	No	Po Chrey
14100505020	S1	Prey Veng	No	Phom Kung
14080907043	S1	Prey Veng	No	Prey Sralet
14091105044	S1	Prey Veng	No	Daun Sdeung
14100107003	S1	Prey Veng	No	Wat Trach
14100206004	S1	Prey Veng	No	Chea Khlang
14090904034	S1	Prey Veng	No	Ta Hel
14080207006	C1	Prey Veng	No	Banteay Teuk
14070302007	C1	Prey Veng	No	Hun Sen Neak Loeung
14080503022	C1	Prey Veng	No	Mesar Prachann
14100503019	C1	Prey Veng	No	Mebonn
14100204005	C1	Prey Veng	No	Svay Bo Preuk
14080202011	C1	Prey Veng	No	Trea

14090903035	C1	Prey Veng	No	Ta Mao
14100601022	C1	Prey Veng	No	Prey Chraing
14100507018	C1	Prey Veng	No	Habo
14091007039	C1	Prey Veng	No	Sathea

MoESY Data

In addition to the survey data collected, the evaluation team made use of the extensive school level data set provided by the MoEYS. This was used for developing criteria for choosing the survey sample as well as an analysis of the impact of school feeding on attendance, promotion, drop-out and repetition rates

Issue with MoESY data: The MoESY data on promotion, drop-out and repetition rates are net data which include incoming students during the year. The data are calculated such that

Drop-out Rate + Promotion Rate + Repetition Rate = 100%.

This is problematic when there are incoming students during the year: hence for many schools we have promotion rates that are >100% and negative drop-out rates. We cannot separate the effect of incoming students and hence the data are subject to measure error. We therefore call for caution when interpreting the results of these models, especially those concerning drop-out rates, although the problem is partly mitigated by the fact that we look at changes over time.

Data analysis

DARA's quantitative team conducted the analysis based on (i) the MoEYS data, (ii) the household survey, and (iii) the school survey.

A great deal of initial exploratory and descriptive analysis was carried out, most of which is presented graphically in the body of the report. Afterwards an econometric analysis was carried out, the details of which are described below.

Quantitative Analysis

MoEYS Data

The MoEYS data cover all Cambodian schools and ranges from the school years 2001-2002 to 2009-2010, with around 5,500 schools for each year[78]. Since each school is uniquely identifiable in each year advantage was taken of this to apply a panel data approach, which was checked with regressions on the pooled sample as well as regressions on changes in the period 2002-2009.

Outcome variables (OutVar):

1. logarithm of total enrolment (all class levels)
2. promotion rate (6th grade)

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[78] The number of schools change each year as some schools are discontinued and others constructed and hence the panel is not balanced.

3. repetition rate (6th grade).

Intervention variables (IntVar):

1. **WFPCurrent**. Receiving school feeding in current year (dummy variable, 1 if yes)
2. **1stYearWFP**. First year of receiving school feeding (dummy variable, 1 if yes)
3. **DisContWFP**. Discontinued WFP school (dummy variable, 1 if yes)

Explanatory variables (ExVar):

1. **Shifts**. Number of shifts
2. **DisAdvSchool**. Disadvantaged school (dummy variable, 1 if yes)
3. **PAExists**. PA exists in school (dummy variable, 1 if yes)
4. **Students/Teacher**. # Students per teacher
5. **Students/Room**. # Students per room
6. **Students/Classroom**. # Students per classroom
7. **TrainedTeachers**.Trained teachers as proportion of total teachers
8. **Com&MonkTeacher**. Community/monk teachers as proportion of total teachers
9. **ContractTeachers**. Contract teachers as proportion of total teachers
10. **CleanWater**. Clean water source at school
11. **ToiletFacilities**. Toilet facilities at school
12. **WithoutGoodFloor**. Proportion of classrooms without good flor
13. **WithoutGoodRoof**. Proportion of classrooms without good roof
14. **WithoutGoodWall**. Proportion of classrooms without good wall
15. **NewDesksNeeded**. # New desks needed per student
16. **NewCharisNeeded.** # New chairs needed per student
17. **NewBoardNeeded.** Proportion of classrooms needing new board
18. **NewBenchNeeded**. Proportion of classrooms needing new teacher's bench

Panel data analysis

A fixed-effects (within-group) estimator was used. Due to serial correlations in the error structure a Baltagi-Wu (BW) estimator was used to take this into account. However, even using this model serial some evidence of correlation remained. An Arrellano-Bond dynamic estimator including one lag of the outcome variable was tried as well, but this did not seem to solve the problem and the BW estimator was chosen.

Then, for models were estimated for each of the outcome variables (each model also includes a constant term). Notice that we have included a set of year dummy variables to take time variation into account:

Table 1: Fixed-Effects Models Estimated

	FE1. Baseline	FE2. Linear	FE3. Squares	FE4. Squares and lags	FE5. Squares and lags with linear trend
IntVar	Yes	Yes	Yes	Yes	Yes

ExVar		Yes	Yes	Yes	Yes
Squares of ExVar			Yes	Yes	Yes
First lag of ExVar				Yes	Yes
Linear district trend					Yes
Year dummies	Yes	Yes	Yes	Yes	Yes

Note: All models estimated using the within-estimator.

Differenced model

As a check on the panel data model, the change over the entire period was analysed. All variables were differenced, such that for each variable "X" the new variable is

$$DIF(X)=X(year\ 2009)-X(year\ 2002)$$

Hence DIF(X) indicates that we have taken the difference between 2002 and 2009 of the variable X.

A standard regression model was then estimated on these DIF(X)-variables. Furthermore, as intervention variables we tested both the presence of school feeding (dummy variable, either 1 or 0) as well as the number of years the school had received school feeding in 2001-2009.

Four models when then estimated for each outcome variable (each model includes a constant term). Notice that here we have included a dummy variable for each district to scoop up regional heterogeneity.

Table 2: 2001-2009 Difference Models Estimated

	D1. Current WFP presence	D2. Current and past WFP presence	D3. Cumulative WFP effect - linear	D4. Cumulative WFP effect - quadratic
DIF(Current WFP presence)	Yes	Yes		
WFP Presence in any year after 2002		Yes		
# years of WFP presence			Yes	Yes

2002-2009				
Square of # years of WFP presence 2002-2009				Yes
DIF(ExVar)	Yes	Yes	Yes	Yes
DIF(Squares of ExVar)	Yes	Yes	Yes	Yes
District dummies	Yes	Yes	Yes	Yes

Note: All models estimated by OLS with robust standard errors.

Overview of Results

Table 3: Estimated effect of current presence of WFP, Fixed Effects Estimator

Years 2002-2009, 36000-45000 observations	Estimated effect on dependent variable of WFP presence by model				
Dependent variable	FE1	FE2	FE3	FE4	FE5
Logarithm of enrolment	0.0113*** (3.40)	0.0248*** (4.35)	0.0227*** (4.19)	0.0209*** (3.75)	0.0222*** (3.87)
	B 1.1, R^2 .01	B 1.2, R^2 .01	B 1.2, R^2 .01	B 1.3, R^2 .02	BW 1.3, R^2
Promotion rate, 1st grade	1.168** (3.23)	1.279* (2.43)	1.078* (2.05)	1.295* (2.14)	1.042 (1.68)
	B 1.95, R^2	B 1.95, R^2	B 1.95, R^2	B 2.0, R^2 .04	B 2.0, R^2
Repetition rate, 1st grade	-0.300 (-1.27)	-0.217 (-0.63)	-0.256 (-0.75)	-0.765 (-1.94)	-0.411 (-1.00)
	B 1.95, R^2	B 1.96, R^2	B 1.96, R^2	B 2.0, R^2 .02	B 2.1, R^2 .01
Drop-out rate, 1st grade	-0.807* (-2.26)	-0.746 (-1.46)	-0.524 (-1.03)	0.0451 (0.07)	-0.129 (-0.21)
	B 2.1 R^2 .04	B 2.1 R^2 .03	B 2.1 R^2 .03	B 2.1 R^2 .05	B 2.1 R^2 <.01
Promotion rate, 2nd grade	1.072** (2.60)	1.886** (3.09)	1.711** (2.82)	2.350*** (3.53)	1.654* (2.41)
	B 1.92, R^2 .01	B 1.94, R^2	B 1.94, R^2	B 2.0, R^2 .04	B 2.0, R^2
Repetition rate, 2nd grade	-0.0223 (-0.11)	-0.102 (-0.36)	-0.135 (-0.48)	-0.428 (-1.32)	-0.231 (-0.68)
	B 2.0, R^2 .02	B 2.0, R^2 .01	B 2.0, R^2 .01	B 2.0, R^2 .02	B 2.1, R^2

Years 2002-2009, 36000-45000 observations	Estimated effect on dependent variable of WFP presence by model				
Dependent variable	FE1	FE2	FE3	FE4	FE5
Drop-out rate, 2nd grade	-1.187** (-3.00)	-1.669** (-2.87)	-1.498** (-2.58)	-1.536* (-2.33)	-1.701* (-2.53)
	B 2.0 R² .03	B 2.0 R² .03	B 2.0 R² .03	B 2.1 R² .03	B 2.1 R² <.01
Promotion rate, 3rd grade	1.105* (2.39)	1.756* (2.43)	1.755* (2.44)	1.688* (2.17)	1.12 (1.41)
	B 1.9, R² <.01	B 1.9, R²	B 1.9, R²	B 2.0, R² .05	B 2.0, R²
Repetition rate, 3rd grade	-0.177 (-0.95)	-0.551* (-2.02)	-0.574* (-2.10)	-0.332 (-1.05)	-0.265 (-0.79)
	B 2.0, R² .01	B 2.0, R² .01	B 2.0, R² .01	B 2.0, R² .01	B 2.1, R²
Drop-out rate, 3rd grade	-1.588*** (-3.75)	-2.413*** (-3.75)	-2.299*** (-3.58)	-1.723* (-2.36)	-1.950** (-2.61)
	B 2.0 R² .02	B 2.0 R² .01	B 2.0 R² .01	B 2.0 R² .02	B 2.1 R² <.01
Promotion rate, 4th grade	1.979*** (3.87)	5.226*** (6.63)	5.212*** (6.67)	4.093*** (4.72)	3.697*** (4.05)
	B 1.6, R² .03	B 1.6, R² .05	B 1.7, R² .07	B 1.8, R² .07	B 1.8, R² .03
Repetition rate, 4th grade	-0.0136 (-0.09)	-0.169 (-0.80)	-0.179 (-0.85)	-0.263 (-1.05)	-0.282 (-1.06)
	B 2.0, R² .02	B 2.0, R² .02	B 2.0, R² .02	B 2.0, R² .02	B 2.1, R²
Drop-out rate, 4th grade	-1.059* (-2.45)	-2.575*** (-3.84)	-2.406*** (-3.59)	-2.622*** (-3.43)	-2.715*** (-3.50)
	B 2.0 R² .01	B 2.0 R² <.01	B 2.0 R² <.01	B 2.0 R² .01	B 2.0 R² <.01
Promotion rate, 5th grade	1.892*** (3.62)	4.076*** (4.90)	4.120*** (4.98)	2.294* (2.46)	1.666 (1.70)
	B 1.5, R² .02	B 1.5, R² .02	B 1.6, R² .02	B 1.7, R² .02	B 1.7, R² .04
Repetition rate, 5th grade	-0.160 (-1.32)	-0.300 (-1.73)	-0.298 (-1.72)	-0.334 (-1.67)	-0.372 (2.61)
	B 2.0, R² .01	B 2.0, R² .02	B 2,0, R² .02	B 2.0, R² .02	B 2.0, R² .
Drop-out rate, 5th grade	-2.025*** (-4.75)	-1.898** (-2.82)	-1.817** (-2.70)	-1.336 (-1.70)	-1.440 (-1.79)
	B 2.0 R² .01	B 2.0 R² <.01	B 2.0 R² <.01	B 2.0 R² .01	B 2.0 R² <.01
Promotion rate, 6th grade	0.896 (1.82)	2.253** (2.76)	2.328** (2.86)	0.574 (0.61)	-0.836 (-0.86)
	B 1.4, R² .02	B 1.4, R² .01	B 1.4, R² .01	B 1.6, R² .01	B 1.6, R² .06

Years 2002-2009, 36000-45000 observations	Estimated effect on dependent variable of WFP presence by model				
Dependent variable	FE1	FE2	FE3	FE4	FE5
Repetition rate, 6th grade	-0.354*** (-3.36)	-0.401** (-2.65)	-0.399** (-2.63)	-0.376* (-2.05)	-0.399* (-2.02)
	B 1.9, R^2	B 1.9, R^2	B 1.9, R^2 .01	B 2.0, R^2 .01	B 2.0, R^2
Drop-out rate, 6th grade	-0.570 (-1.75)	-0.826 (-1.66)	-0.795 (-1.60)	-0.662 (-1.10)	-0.207 (-0.33)
	B 2.1 R^2 .02	B 2.1 R^2 .01	B 2.1 R^2 .01	B 2.2 R^2 .02	B 2.2 R^2 <.01
Notes: t-values in parenthesis. * Significant at 5%, ** Significant at 1%, *** Significant at 0.1% B: Baltagi-Wu test for serial correlation in the residuals. B is between 0 and 4, and BW=2 if no serial correlation. R^2 reported is overall R^2.					

Model specification and fit

We use R^2 as a measure of fit as this is the standard in the literature.

The very low total R^2 in the panel data models is most likely an indication of poor quality of the data as well as the fact that many important socio-economic variables are not available at school level and are not included. Another problem could be non-linearity of the included variables. Squares of variables as well as linear district trends have been included to remove as much unobserved heterogeneity as possible, without materially changing the conclusions.

As can be seen in Table 4 the "within" R^2 is quite high for the income model and not extremely low for the promotion rate model. This suggests that our model does a good job for enrolment and an acceptable job for promotion in explaining how schools develop throughout time. But individual effects are very important and therefore overall R^2 is low. Table 4: Full Regression Results for Selected Outcomes, Fixed Effects Estimator

Furthermore, we present the results of a differenced model in Table 5 that supports our findings from full panel analysis and has acceptable R^2 levels.

Serial correlation in errors and omitted variable bias

Serial correlation: As explained above, a Baltagi-Wu estimator was used to deal with the problem of serial correlation. A model allowing for linear time trends in each district was also used to remove unobserved heterogeneity. Inspecting

Table 3 we can see that the only model where serial correlation in the errors remains a problem is the enrolment model.

It is known that the problem of serial correlation in errors is increasing in the number of periods of the panel and therefore a differenced model using only two periods was estimated, see Table 5.

Omitted variable bias: Many important variables are not included in this model due to poor availability, in particular socio-economic variables (although we feel that some of these variables are proxid by the school condition variables included). Correlation between these variables and the intervention variables would lead to biased estimators. Since we are using a panel design any time invariant differences across schools are removed automatically. The identifying assumption for our estimator is then that either (i) the omitted variables are not correlated with the intervention variables after controlling for school conditions, or (ii) omitted variables vary approximately linearly over the period in each district, in which case model FE5 is valid.

The assumptions are hard to test and we have not been able to identify instrumental variables to remedy the possible existence of a bias. In the case of socio-economic variables we can hypothesize about the nature of the bias: if interventions generally follow a deterioration in social-economic conditions and worse socio-economic conditions negatively influence enrolment and promotion rates, then the estimators will be biased towards zero. In this case, finding a significant effect in the model gives us even stronger proof of an actual effect.

Simultaneity bias: Particularly with enrolment it seems possible that there is a two-way relationship with the school conditions used as explanatory variables. For instance, if the number of teaching staff is fixed higher enrolment will lead to a lower teacher to student ratio. To test whether this has any influence over our estimates we estimated a model with enrolment as the dependent variable and only intervention variables and lagged explanatory variables. The estimate for the effect of WFP in the current year on enrolment is 2.5%, which is comparable to the results obtained with the full model. We therefore feel confident that this has not distorted our main results.

Table 4: Full Regression Results for Selected Outcomes, Fixed Effects Estimator

Years 2002-2009	Dependent Variable					
	Log(Enrolment)			Promotion Rate 4th Grade		
Independ. variables	Linear	Squared	Lagged	Linear	Squared	Lagged
WFPCurrent	0.02*** (3.87)	-	-	1.12 (1.41)	-	-
1stYearWFP	-0.01*** (-3.46)	-	-	-0.46 (-0.79)	-	-
DisContWFP	0.02* (2.29)	-	-	1.51 (1.59)	-	-
Shifts	0.03*** (11.76)	-	0.01*** (6.09)	2.31*** (5.68)	-	2.02*** (5.19)
DisAdv School	-0.01** (-2.89)	-	-6E-3 (-1.46)	-0.70 (-0.83)	-	-0.79 (-1.05)

Years 2002-2009	Dependent Variable					
	Log(Enrolment)			Promotion Rate 4th Grade		
Independ. variables	Linear	Squared	Lagged	Linear	Squared	Lagged
PAExists	-1E-3 (-0.82)	-	-8E-4 (-0.42)	0.83 (1.95)	-	0.54 (1.41)
Students/ Teacher	2E-3*** (49.04)	-4E-6*** (-36.18)	3E-5 (1.57)	0.11*** (11.60)	-2E-4*** (-9.20)	-0.02*** (-5.22)
Students/ Room	3E-3*** (35.57)	-3E-6*** (-22.34)	3E-4*** (6.61)	0.14*** (9.87)	-2E-4*** (-7.09)	-0.03* (-2.45)
Students/ Classroom	3E-3*** (31.91)	-9E-6*** (-27.57)	-6E-5 (-1.20)	0.19*** (10.81)	-5E-4*** (-8.68)	-0.06*** (-6.11)
Trained Teachers	0.06*** (3.33)	-0.09*** (-4.59)	-0.01 (-1.95)	3.91 (1.19)	-5.48 (-1.41)	0.22 (0.22)
Com&Monk Teachers	0.11 (1.52)	-0.11 (-1.46)	0.02 (1.05)	14.61 (1.12)	-20.89 (-1.46)	2.97 (0.85)
Contract Teachers	0.08*** (5.76)	-0.10*** (-6.90)	7E-3* (2.09)	5.61* (2.04)	-5.84* (-2.02)	-0.24 (-0.35)
Clean Water	-6E-4 (-0.34)	-	8E-4 (0.48)	0.28 (0.91)	-	0.42 (1.40)
Toilet Facilities	0.02*** (7.92)	-	3E-3 (1.71)	0.78* (2.21)	-	-0.23 (-0.68)
Without GoodFloor	0.08*** (7.57)	-0.10*** (-9.31)	-0.01*** (-4.95)	4.83** (2.60)	-6.39*** (-3.30)	-1.27** (-2.73)
Without GoodRoof	0.03** (2.84)	-0.05*** (-4.01)	-3E-3 (-0.97)	2.19 (1.06)	-2.59 (-1.15)	-0.59 (-0.99)
Without GoodWall	0.08*** (6.92)	-0.11*** (-9.32)	-8E-3** (-2.65)	5.90** (3.05)	-7.72*** (-3.71)	1.00 (1.88)
NewDesks Needed	0.222*** (6.02)	-0.40*** (-5.76)	0.10*** (4.02)	-0.72 (-0.12)	1.02 (0.09)	-1.97 (-0.47)
NewChairs Needed	-0.136** (-3.20)	0.24** (2.87)	-0.07* (-2.30)	-14.10 (-1.93)	26.93 (1.84)	0.01 (0.00)
NewBoard Needed	0.05*** (3.92)	-0.05*** (-3.80)	7E-3 (1.71)	3.62 (1.56)	-4.58 (-1.77)	1.34 (1.75)
NewBench Needed	0.04*** (4.03)	-0.06*** (-4.82)	-7E-4 (-0.21)	2.44 (1.25)	-3.51 (-1.69)	0.74 (1.24)
	Within R²: .49, Between R²: .05 Total R²: .05, Obs: 39505			Within R²: .07, Between R²: <.01 Total R²: <.01, Obs: 36370		

Notes: t-values in parenthesis. Furthemore model includes an intercept, time dummies and district/year interactions. Time dummies are very significant.

Table 5: Estimated effects for selected outcomes, difference estimator

OLS on change 2002-2009. 4979 observations.					
Dep. Var.	Intervention Variable	D1	D2	D3	D4
Log enrolment R^2 is 0.53 for all models (differ only in third decimal).	DIF(Current presence of WFP)	0.061*** (4.00)	0.056*** (3.59)		
	WFP Presence in any year after 2002		0.021 (1.17)		
	Years of WFP Presence since 2002			0.012*** (3.37)	0.002 (0.21)
	Square of years WFP presence since2002				0.002 (1.14)
Repetition rate 4th grade R^2 is 0.11 for all models (differ only in third decimal).	DIF(Current presence of WFP)	0.434 (0.83)	0.662 (1.22)		
	WFP Presence in any year after 2002		-0.945 (-1.61)		
	Years of WFP Presence since 2002			-0.046 (-0.40)	-0.595 (-1.94)
	Square of years WFP presence since2002				0.085* (1.97)
Promotion rate 4th grade R^2 is 0.21 for all models (differ only in third decimal).	DIF(Current presence of WFP)	1.466 (0.91)	1.527 (0.92)		
	WFP Presence in any year after 2002		-0.250 (-0.14)		
	Years of WFP Presence since 2002			0.572 (1.54)	-1.955* (-1.97)
	Square of years WFP presence since2002				0.389** (2.73)
Notes: t-values in parenthesis. T-values calculated with robust standard errors. * Significant at 5%, ** Significant at 1%, *** Significant at 0.1%					

Household Survey Data

Initially, it was planned to use a combination of three types of estimators: matching and regression discontinuity. However, unavailability of quantitative selection criteria meant that a regression discontinuity design was impossible, and therefore, all survey data was analysed using matching techniques and ordinary regression.

Outcome variables (OutVar):

1. Health outcomes: Haemoglobin levels, haemoglobin deficiency, dietary diversity, height, weight, illness within previous two weeks, MUAC.
2. Value Transfer: difficulty in covering school costs, saving/loosing time when child goes to school, animal sales, food security (HFIA).
3. Education: # days attended school last week.

Animals are seen as buffer assets and so animal sales are a measure of financial distress. For education only attendance was analysed to complement the analysis of the MoEYS data and the school survey described below.

Intervention variables (IntVar):

1. Received SMP/THR.

Explanatory variables (ExVar):

1. **HighEduc**. Highest # of completed years of education in household.
2. **Dep.** # of dependants per income earning household member.
3. **LogIncome.** Logarithm of total labour income and transfers per household member[79].
4. **IntDepInc.** Interaction between variables 3 and 4.
5. **LogAssSale.** Log of sales   of assets[80].
6. **NoIncome.** Indicator for no labour nor transfer income (dummy variable, 1 if no income).
7. **Gender.** Gender (dummy variable, 1 if boy).
8. **CleanWater.** Access to clean water source (dummy variable, 1 if yes).
9. **Latrine.** household has latrine (dummy variable, 1 if yes).
10. **AssetClass#.** Asset class (dummy variables to identify which class the household belongs to).
11. **Age#.** Age (dummy variable for each age between 9 and 15, very few observations outside this range).
12. **Province.** Province (dummy variable, 1 if Prey Veng).
13. **Profession#.** Profession (dummy variables for each of the profession groups were included).

We have approached the analysis by estimating a number of regression models for each of the outcome variables and backing these regression results up with a matching estimator. Both approaches are described below.

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[79] This is actually the logarithm of asset sales +1 to avoid problems with taking the logartihm of zero. This transformation is often used but is essentially arbitrary.
[80] Ibid.

But before describing these types of analysis we want to address why it is important to engage in this type of analysis. Consider first the distribution of the explanatory variables between the SMP-only and SMP-control groups.

	Means		Tests for inequality of distribution	
Variable	SMP-only	SMP-control	T-test of means	Ranksum (z-value)
HighEduc	6.85	7.43	4.0 ***	3.4***
Dep	1.40	1.45	0.7	0.8
LogIncome	10.97	11.56	3.36***	4.8***
IntDepInc	14.34	16.10	2.3*	2.2*
LogAssSale	6.15	5.55	-1.9	-1.6
NoIncome	9.7%	7.5%	-1.5	-1.5
Gender (Male)	46.3%	48.2%	0.7	0.7
CleanWater	78.6%	91.6%	6.8***	6.6***
Latrine	20.9%	29.3%	3.6**	3.5***
Asset1(poorest)	13.0%	16.4%	1.7	1.7
Asset2	40.8%	46.6%	2.1*	2.1*
Asset3	26.6%	20.9%	-2.5*	-2.5*
Asset4(richest)	19.5%	16.1%	-1.6	-1.6
Age (years)[81]	11.9	11.8	-0.7	-0.6
Prof: agriculture	80.7%	67.5%	-5.6***	-5.5***
Prof: Unskilled labour	7.8%	12.4%	2.8**	2.7**
Prof: Skilled labour	0.9%	2.3%	2.0*	2.1*
Prof: Permanent Salaried Worker	3.3%	6.7%	2.9**	2.9**
Prof: Profesional Worker	2.2%	2.1%	-0.1	-0.1
Prof: Trader	2.5%	6.6%	3.6***	3.8**

[81] Here we have compared the mean age of the two groups but in the statistical models we use a dummy for each age group to take into account the likely non-linearity of the age effect on many outcome variables.

Prof: Non-earning	2.5%	2.3%	-0.3	-0.3

Notes: The t-test is done for means with different variance whenever the variance is significantly different. The Ranksum test is the two-sample Wilcoxon rank-sum test (Mann-Whitney) for distributional equivalence.

* Significant at 5%, ** Significant at 1%, *** Significant at 0.1%

In order for a direct mean comparison approach to be valid, the above variables should have the same distribution in the intervention group as well as the control group. There are some remarkable differences:

- Income is almost 60% higher in the control group (difference in logarithms of 0.6 translates to a difference of roughly 60%).
- There is a very big difference in the access to clean water and latrines, which will influence in particular health variables.

Hence, it seems that some type of analysis that takes into account these differences in characteristics is called for, a mere comparison of means will distort the picture given that the recipients of SMP have poorer conditions than those in the control group.

Note on control groups
Different control groups: Two groups were originally sampled.

- SMP-control: this group was chosen by selecting, for each intervention school, the non-intervention school in the same district that was most "similar", based on the available MoEYS data.
- THR-control: this group consists of children at THR-only schools that do not receive THR.

For the purpose of estimation we have pooled these two control groups whenever we have estimated models in which we include controls (i.e. include explanatory variables). This is warranted as long we believe that our explanatory variables sufficiently control for heterogeneity between these groups. Given that we have at our disposal a fairly rich set of such variables, we have thought it convenient to gain more statistical power by pooling the two groups whenever possible.

Contamination of control group: When the control was chosen each WFP school was matched with a non-WFP in the same district, in order to control for differences in socioeconomic variables. To achieve this it was sometimes (and in particular in Prey Veng) necessary to choose control schools that were discontinued WFP schools, since alternatives were not available within the same district.

Although these schools were discontinued this would imply contamination of the control group if the effect of WFP is still present when the survey is carried out. Two arguments give us confidence that the analysis is still valid: (i) Most of the contamination would have take place in Prey Veng and would therefore be captured as a difference between provinces, (ii) if

a positive effect of WFP is still present, this would make it more *difficult* to trace differences in the analysis – hence any positive effect of WFP found in the analysis is still valid and even more significant.

Regression analysis
Using regression analysis to assess treatment effects of a programme is generally speaking valid under two assumptions, unconfoundedness and overlap of support[82].

Unconfoundedness says that conditional on the explanatory variables included in the model, the outcome with/without treatment is orthogonal to the treatment assignment mechanism. This implies that there should be no variables apart from those included in the model that affect both outcomes and treatment assignment. This is of course near impossible to attain completely but we do some testing of this assumption when we estimate the matching estimators.

Overlap of support requires that within the control group there are individuals with similar characteristics to all the members of the treatment groups. Again, at the stage of the matching model we will impose this restriction.

The models estimated are (note that all the models include a constant term as well):

	R1. Baseline	R2. Linear	R3. Squares	R4. Squares and district controls
IntVar	Yes	Yes	Yes	Yes
ExVar		Yes	Yes	Yes
Squares of ExVar		Yes	Yes	Yes
District dummies				Yes
Control group	Either SMP-control or THR-control	SMP-control and THR-control pooled	SMP-control and THR-control pooled	SMP-control and THR-control pooled

"Matching" analysis of Average Treatment Effect on the Treated (ATT)
For the matching models we have used a propensity score approach. This approach is by now extremely well tested practically in the programme evaluation literature. Briefly speaking, it consists of first calculating the propensity of a given individual to receive treatment given his

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[82] For a thorough review of this as well as many other types of estimators, including the matching estimators employed later, see Imbens and Wooldridge, "Recent Advances in the econometrics of program evaluation", Journal of Economic Literature, 2009, Volume 47(1).

characteristics. This propensity score can then be used to "match" the individuals to assure that each treatment individual is compared with the most similar control individual.

- Variables used for matching: ExVar and squares of the variables in ExVar.
- Type of matching estimators :
  - Kernel estimator. This type of estimator constructs, for each intervention child, an artificial control child which is a weighting of all the control children based on the propensity score. A Gaussian kernel was used for the weights. This estimator seems more appropriate in our context, and we will use both to make the comparison.[83]

The matching estimator is valid if two properties are met:

- Balancing: the covariates must be balanced conditional on the propensity score. This was tested in the model building, and although not completely satisfied, only a few variables were not balanced in a subset of the support. We feel confident that this is a minor problem.
- Unconfoundedness conditional on the propensity score: conditioning on the propensity score must give us unconfoundedness, as described above.

To assure the overlapping support condition above the analysis was restricted to the "common support" of the propensity score of the two groups.

Weaknesses of the Analyses
- Lack of a well-specified parametric model: Several of the regression models did not pass a Ramsey test for mis-specification. It seems that there are many non-linearities that we cannot account for. Including squares of variables and regional controls (district dummies) goes some way towards improving this but does not solve the problem entirely. In this context the matching estimators are different in that they are only parametric in the estimation of propensity scores. This may work to their advantage. An interesting venue for further analysis but which was outside the scope of the current report is estimation of quantile response, to better assess *who* school feeding are helping most.
- Sample size and heterogeneity in effects: The complexity of the population as well as the existence of different WFP programmes has meant that the control has not been as large as required for the estimation to be able to assess heterogeneity in the effect of school feeding across different population groups. Studies clearly targeted at measuring *specific* effects could deal with this.

Note on Measuring Income
Since the study consists of a single household survey it has not been possible to obtain "before and after" information that would allow us to directly assess the effect of school feeding. Neither did we have clear quantitative criteria for WFP's school selection on which to base our sample selection. Hence, we have been forced to choose schools based on the available information and control for differences in the non-intervention and intervention group after having obtained all the background information through the survey.

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[83] The kernel estimator with a Gaussian kernel is not asymptotically unbiased but the efficiency gain over the nearest neighbour estimator seems to more than justify its use in this case.

The economic variables are needed to control for differences between the non-intervention and intervention groups, we cannot at the same time measure WFP effects on these. For us to directly measure economics effects in the quantitative data, we would need either before-intervention data on the children in the school feeding programme or a clear set of quantitative criteria which were followed in the selection of intervention schools. As neither were available our analysis of value transfer is based on certain survey questions and the qualitative field work"

Overview of the results

Survey 2010. R^2 for models R1-R4 in brackets.	Intervention variable : SMP				
Dependent variable	**R1** 1318 obs	**R2** 1357 obs	**R3** 1357 obs	**R4** 1327 obs[84]	**ATT** 1366 obs
Haemoglobin levels R^2= (<.01 .11 .11 .14)	-0.111 (-1.17)	-0.146 (-1.46)	-0.151 (-1.52)	-0.066 (-0.64)	-0.078 (-1.17)
Haemaglobin – Cut-off (D) Pseudo-R^2=(<.01 .11 .11	0.125 (1.36)	0.160 (1.64)	0.170 (1.74)	0.113 (1.10)	0.011 (0.42)
Height (cm) R^2= (<.01 .39 .40 .42)	-0.188 (-0.27)	-0.643 (-1.19)	-0.658 (-1.20)	-0.637 (-1.16)	0.266 (0.74)
Height (z-score) R^2= (<.01 .23 .23 .24)	-0.0344 (-0.38)	-0.135 (-1.63)	-0.141 (-1.68)	-0.111 (-1.32)	0.093 (1.39)
Weight (kg) R^2= (<.01 .32 .32 .33)	-0.273 (-0.55)	-0.002 (-0.00)	-0.011 (-0.03)	0.002 (0.01)	0.535 1.53
BMI R^2= (<.01 .04 .05 .06)	5.311 (1.40)	4.626 (1.03)	4.232 (0.98)	4.734 (0.85)	3.669 (1.48)
MUAC R^2= (<.01 .25 .26 .29)	-0.077 (-0.50)	-0.019 (-0.14)	-0.0196 (-0.14)	0.015 (0.12)	0.124 (1.20)
Dietary Diversity (Scale 0-14) R^2= (.04 .20 .21 .23)	0.79*** (5.78)	0.857*** (6.56)	0.865*** (6.59)	0.928*** (6.83)	0.774*** (8.19)
Ill Within Last 2 weeks (D) Pseudo-R^2= (<.01 .04 .04	-0.014 (-0.40)	-0.032 (-0.90)	-0.033 (-0.93)	-0.023 (-0.64)	-0.050* (-2.10)
# Days Ill Within Last 2 Weeks R^2=(<.01 .04 .04 .04)	-0.0384 (-0.65)	-0.231** (-3.15)	-0.229** (-3.12)	-0.233** (-3.01)	-0.227** (-3.01)

[84] Some observations are lost when district dummies are included, as not all districts have both SMP and control schools.

Dependent variable					
HFIA Category (Cat. 1-4, 4 most food insecure) R^2= (<.01 .18 .19 .21)	-0.0243 (-0.33)	-0.0156 (-0.23)	-0.0336 (-0.50)	-0.00876 (-0.12)	-0.0269 (-0.49)
Sales of animals (1000 Riel, 6mths) R^2= (.01 .21 .26 .38)	136*** (3.59)	37 (0.94)	63 (1.70)	75* (1.98)	61* (2.41)
Difficulties in covering school costs (D) Pseduo-R^2=(<.01 .07 .10 ...)	-0.008 (-0.34)	0.016 (0.76)	0.008 (0.36)	-0.007 (-0.30)	-0.006 (-0.29)
Loose time when child goes to school (D) Pseduo-R^2=(<.01 .09 .10	-0.024 (-0.73)	-0.039 (-1.29)	-0.040 (-1.31)	-0.053 (-1.72)	-0.080** (-3.42)
Save time when child goes to school (D) Pseudo-R^2=(<.01 .09 .10	0.083* (2.26)	0.186*** (5.19)	0.182*** (5.05)	0.175*** (4.93)	0.237*** (9.73)
Days attended school last week R^2=(<.01 .05 .05 .10)	-0.049 (-0.76)	0.056 (0.89)	0.054 (0.84)	0.096 (1.44)	-0.009 (-0.16)

Notes: t-values in parenthesis. With the exceptions of "difficulties in covering school expenses", "animal sales", "illness" and "days attended school", all the R4 models and most of the other models passed a Ramsey test for mis-specification.
T-values calculated with robust standard errors. For many models the residuals are not normally distributed. Tests have been made with bootstrapping but as the results are very similar the robust errors have been used.
(D) : Dummy variable (1 if yes, 0 if no).
Regression results estimated by OLS for continuous variables and probit for dummy variables. Observations are weighted by the inverse probability of sampling (which is calculated by strata).
* Significant at 5%, ** Significant at 1%, *** Significant at 0.1%

Specification and robustness: It can be noticed that for most variables, R^2 does not change much at the inclusion of squares and district dummies, suggesting that the simple linear model is not bad at capturing the main effects (or at least, that the unobserved heterogeneity is not squared nor regional differences). As a reference for comparison, Stifel and Alderman (The World Bank Economic Review, vol. 20(3), 2006) have R^2 of 0.30-0.35 in their estimations of the effects of the "glass of milk" programme in Peru (although for a panel data model).

Survey 2010. Results for SMP. R^2 for models R1-R4 in brackets.	**Intervention variable : THR**				
Dependent variable	**R1 499 obs**	**R2 1097 obs**	**R3 1097 obs**	**R4 1066 obs**[85]	**ATT 1066 obs**
Haemoglobin levels R^2= (<.01 .12 .15 .19)	0.135 (0.78)	-0.128 (-1.03)	-0.134 (-1.08)	-0.129 (-0.94)	-0.141 (-1.29)

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[85] Some observations are lost when district dummies are included, as not all districts have both THR and control schools.

Haemaglobin – Cut-off (D) Pseudo-R²=(<.01 .14	-0.0736 (-0.46)	0.257* (1.99)	0.271* (2.09)	0.194 (1.25)	0.074 (1.81)
Height (cm) R²= (<.01 .38 .39 .42)	-0.162 (-0.15)	-0.683 (-0.97)	-0.534 (-0.75)	-0.543 (-0.68)	-0.0798 (-0.12)
Height (z-score) R²= (<.01 .25 .27 .30)	-0.199 (-1.25)	-0.200 (-1.72)	-0.180 (-1.52)	-0.249 (-1.72)	-0.181* (-1.96)
Weight (kg) R²= (<.01 .34 .35 .38)	0.140 (0.17)	-0.450 (-0.85)	-0.334 (-0.62)	-0.322 (-0.53)	0.132 (0.29)
BMI R²= (<.01 .01 .01 .02)	5.555 (1.00)	6.424 (0.98)	6.504 (0.98)	7.223 (0.97)	4.283 (0.94)
MUAC R²= (<.01 .21 .23 .26)	0.248 (0.97)	0.00513 (0.03)	0.0569 (0.31)	0.0399 (0.19)	0.139 (0.90)
Dietary Diversity (Scale 0-14) R²= (<.01 .20 .20	-0.0786 (-0.37)	-0.121 (-0.80)	-0.134 (-0.88)	-0.09 (-0.51)	-0.080 (-0.62)
Ill Within Last 2 weeks (D) Pseudo-R²= (<.01	-0.0892 (-1.64)	-0.119** (-2.76)	-0.128** (-2.98)	-0.118* (-2.37)	-0.118** (-2.86)

# Days Ill Within Last 2 Weeks 	
R²= (<.01 .07 .08
	-0.374*
	(-2.22)
		-0.245**
		(-2.95)
			-0.248**
			(-3.02)
				-0.186*
				(-1.98)
					-0.318**
					(-3.24)

HFIA Category (Cat. 1-4, 4 most food insecure)	0.418*** (3.67)	0.284*** (3.35)	0.261** (3.11)	0.231* (2.43)	0.189** (2.88)
Sales of animals (1000 Riel, 6mths) R²= (<.01 .20 .31	-644 (-1.71)	367 (1.82)	579** (2.89)	242 (1.09)	402* (2.30)
Difficulties in covering school costs (D)	0.063 (1.87)	0.060* (2.27)	0.050 (1.87)	0.050 (1.56)	0.045 (2.03)
Loose time when child goes to school (D)	0.058 (1.30)	-0.028 (-0.74)	-0.0369 (-0.96)	-0.032 (-0.76)	-0.042 (-1.05)
Save time when child goes to school (D)	-0.036 (-0.64)	-0.034 (-0.75)	-0.043 (-0.93)	-0.028 (-0.57)	-0.017 (-0.40)
Days attended school last week R²=(<.01 .07 .07	0.042 (0.55)	0.120 (1.74)	0.125 (1.76)	0.131 (1.69)	0.155** (2.85)

Notes: t-values in parenthesis. T-values calculated with robust standard errors. For many models the residuals are not normally distributed. Tests have been made with bootstrapping but as the results are very similar the robust errors have been used.

(D) : Dummy variable (1 if yes, 0 if no).

Regression results estimated by OLS for continuous variables and probit for dummy variables. Observations are weighted by the inverse probability of sampling (which

is calculated by strata).
* Significant at 5%, ** Significant at 1%, *** Significant at 0.1%

Qualitative Methods

The **qualitative data collection** mainly focused on interviews with stakeholder and focus group discussions. Stakeholder interviews include staff from relevant line ministries, UN, NGO and the donor community. The purpose of these interviews is to collect data on more strategic issues that affect school feeding, such as national development plans, sectoral strategies or other specific interventions that may affect the school feeding interventions. The focus groups discussions will target both beneficiaries living in targeted communes and non-beneficiaries (within control groups). The purpose of these discussions is to understand and explain the causalities and assumptions of the school feeding programme, i.e. why is it successful, why do children attend school, to what extend does it have an effect on household economies and how does that affect dispositions related to education, etc. Topics and interview guides relate to the five categories of the household survey questionnaire (See Annex 7 for Topics list). Tracer interviews will be conducted with household members that have graduated successfully form primary education cycles. The purpose of this interview-approach is to 'trace' the importance of school feeding among graduates.

The wealth ranking was built with the participation of two village chiefs, assisted by one or two more participating persons who have a very good knowledge of the households of their village. The exercise was carried out in one village of each of the two provinces where the evaluation took place. It is an asset based ranking. Village chiefs were asked to write on pieces of paper the name of all the heads of households of their village, and then to classify every households using the pieces of paper into 4 wealth groups, from the poorest to the wealthy. Once households were classified, village chiefs were asked to describe the characteristics of each group, and more specifically to evaluate the number of assets that are owned on an average by the households of each group.

In parallel, the price of the assets listed was collected on the market of Prey Veng, which allowed attributing an interval of total asset score per wealth group. This interval constitutes the cut of points used in the quantitative analysis to separate the 4 wealth groups:

- Poorest: from 0 to 1,170 riels
- Poor_ from 1,171 to 3,542 riels
- Intermediate: from 3,543 to 5,836 riels
- Wealthy: more than 5,837 riels

Household Survey Questionnaire

World Food Programme, Kingdom of Cambodia
Analysis of Programmes Impact
Household Survey Questionnaire
Please write all answers in capital letters

SUMMARY
[Information to be filled before the interview]

1. Province code	5. Household code	
2. District code	6. Intervention Yes=1,No=2	
3. Commune	7. Date of interview	
4. Village code	*(dd/mm/yyy y)*	

Name of interviewer   Signature:_____

Remarks:

Name of supervisor   Signature:_____

Remarks:

7. Name of the child (sample selection)

8. Sex of the child (Male=1 Female=2)

9. Name of the primary school sampled   School code*

*School code and school name is determined by sample designers.

[Ask to the mother]
9. Distance of household to primary school (min)
(use Code Summary 1)

The Respondents will be, mother of the sample selected child and when specified, the selected 4th to 6th grader kid. In case the mother is not at home, the father of the selected child ccan also answer the questionnaire.

MODULE A: Household composition

A household is a group of people who live together and take food from the "same pot." If people cook together, share the same kitchen and eat together, then this is defined as the ONE household In our survey, a household member is someone who has lived in the household at least 6 months, and at least few times in those months.

List all persons residing in the household:

I.D. Code	First name (Start with household head)	Relation to household head (code A1)	Sex Male...1 Female...2	Age (in years)	Marital Status (code A2)	Age of Marriage (in years)
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Further details of household members
(IMPORTANT: please keep coherence with the I.D. Code above, in same order)

I.D.	Education	Currently	If yes, is this the same school of		Current two main occupations *(code A4)*	
Code	(Highest class completed)	**attending** **school?**	the sample selection? (See Q9 of the Summary)			
		Yes=1, No =2	**Yes=1, No =2**		Occupation/ /Activities 1	Occupation/ /Activities 2
	(code A3)					
1						
2						
3						
4						
5						
6						
7						

MODULE B: Information on members who used to live in the household but now live elsewhere

Do you have family members who grew up in the household but now live elsewhere? *Please use 1=Yes and 2=No.*

If yes, please fill out the following information for each of these. Otherwise go to Module C

ID CODE	First Name	Relation to household head (code A1)	Sex Male....1 Female....2	Age (in years)	Did [NAME] have school meals/THR? Yes...1, No...2	If yes, how many years did [NAME] have school meals /THR?
B1						
B2						
B3						
B4						
B5						
B6						
B7						
B8						
B9						
B10						

Note that THR means Take Home Ration

Further questions about members who grew up in the household but now live elsewhere
(IMPORTANT: please keep coherence with the I.D. Code above, in same order)

ID CODE	Where does [NAME] live now? (code B1)	What is his/her primary occupation? (code A1)	Does [NAME] still help the household or community in some way? (code B2)		Did [NAME] receive any assistance for studying?If yes, name maximum 2 most important types (Code C4)	
B1						
B2						
B3						
B4						
B5						
B6						
B7						
B8						
B9						
B10						

MODULE C: Educational characteristics of school age children
Respondent: the Household head or an adult who knows educational information of all
school-age children in the household: TO BE FILLED FOR ALL HOUSEHOLD MEMBERS of 6-18 years old
Please copy I.D. code from family list in Module A carefully

I.D.	At what age (in years)		How many grades has		If [NAME] currently attends school	
Code	did [NAME] start school? (write 999 if never attended school)		[NAME] repeated (if ever repeated)? (# of years)		Highest completed grade	# days attended last week

Further questions, copy I.D. codes from table above

I.D.	If [NAME] currently attends school			If <u>not</u> currently attending school	
Code	Did [NAME] receive any exter-nal support for this?If yes, name the most important (Code C4)	Can you give 2 important reasons why [NAME] attends this school?(code C1)		Reason for stopping school (name up to 2 reasons) (code C3)	

Further questions, copy I.D. codes from table above

I.D.	If [NAME] <u>never</u> attended school				
Code	Can you give 2 main reasons				
	why [NAME] never attended school?				
		(code C3)			

**MODULE D: Dietary
Diversity**

*[Respondent: child who was picked in school(4th-6th grade) through the random
sampling process helped by*
**mother or
father**
I would now like to ask you about the foods you consumed yesterday at any time during the day or
night.
 I would like to know if they consumed the food whether it was eaten separately or
combined with other foods
 whether at home or outside the home. Could you also say if that was part of the School
meal at school, or the take
home ration at home if received? Start with the first food eaten in the
morning.

*Please, insert day of
week you are doing
the recall*

**[write down all food and drinks mentioned by the respondent, clarifying whether
this food came from the school meal
program, or take home ration, or not. When the respondent has finished, probe for
meal and snacks not mentioned]**

1. Did you eat or drink:	**Child ID #____**		Insert one column for yes /no		
Code: 0=No; 1=Yes	**a.**		**As part of the SMP/THR**	**Not part of the SMP/THR**	
	Any rice, noodles, bread, maize or other staple food made from grains				
	b.				
	Any pumpkin, yellow sweet potatoes, or carrots				
	c.				
	Any white potatoes, cassava (manioc), white yams or other white root vegetables				
	d.				
	Any dark green leafy vegetables				
	e.				
	Any ripe (orange) mangoes or papayas				
	f. Any other fruits				
	g. Any other vegetables				

	Any liver, kidney, heart, blood, intestine or other organs				
	h.				
	Any meat such as beef, pork, lamb, goat, rabbit, deer, chicken, duck, other birds, snake, snail, frog, rat, insects or other small animals				
	i. Any eggs				
	j.				
	Any fresh or dried fish or shellfish*				
	k.				
	Any foods made from beans, lentils, peas, or nuts				
	l. Any food made with oil, fats or coconut milk				
	m.				
	Any sugar or sugary foods such as sweets, chocolate, candies, cakes, pastries, biscuits, sweet soups such as mung bean or pumpkin soup				
	n.				
	Any fried snacks such as fried bananas, fried sweet potatoes, shrimp chips				
	o. Any sugary drinks such as soda, fruit juice or soya drink				
	p.				
	Any milk – fresh, tinned or powdered, or milk products such as cheese or yoghurt				
	q. Any fish paste or fish sauce				
2. How many meals or snacks did you eat yesterday?	**a.**				
	Number of meals				
	b.				
	Number of snacks				
	c.				
	Don't Know				
3. How many plates of food in total did you have yesterday?	**1.** ½ bowl				

	2. **¾ bowl**				
	3. Full bowl				
	4. 1 ½ bowls				
	5. 2 bowls				
	6. More than 2 bowls				
4. Was this a typical day's food intake for (NAME)? [Ask to the mother]	**0 = No**				
	1 = Yes **Skip to**				
5. If it was not typical was it because:	**a.**				
Code: 0=No; 1=Yes	**Child was not hungry, did not have an appetite**				
	b. **Child was sick**				
	c. **There was not enough food to feed (NAME) more**				
	d. Other - specify_____ _____				

Benefit received.

[Respondent: Mother of the child who was picked in school(4th-6th grade) through the
random sampling
process]

		[Only if they receive THR]			
Type	**How many years have you received school meals or THRs?**	**How many household members benefit from THR?** **(#)**	**Monthly quantity of food received** **(taking unto account THR only)** **(in KG)**		

	(# of years)			**Rice**	**Oil**	**Beans**
SMP						
THR						
Who do you share your THR with? *(Code D1)*	Do you sell any of your THR? *(Code D2)*	If you sell your THR, what do you use that money for? *(Code D3)*	Do you use iodised salt for your family? Yes=1 , No=2	If yes, Do you have it now? Yes=1 , No=2	[to the interviewer: Please do the test of iodised salt and answer if Positive= 1 Negative=2]	Do you use vitamin A fortified oil for your family? Yes=1 , No=2, Don't know= 3

Ask the following questions to the school age child who was picked at school through the sampling process

ID code	Do you eat all your school meal every school day? (code D4)	How often do you bring home your school meal (not THR) to your family? (CODE D5)				

MODULE E: Antropometry and Health

Respondent: Mother, refering to child who was picked in school by radom sampling process

We would now like to measure your child [NAME]'s height and weight

ID code (copy from MODULE A)	Childs height (in cm)	Childs weight (in kg)	MUAC	Presence of bilateral oedema (1=Yes, 2=No)	Age (in months)	Has the child been dewormed in the past 6 months

					. (code E1)
ID code (copy from MODULE A)	Has the child suffered from any illness in the last 2 weeks? (code E2)	How many days in this period, has the child been unable to attend school due to illness? (# of days)	We would like to measure the strength of your child's blood. This involves taking a drop of blood. Do you give us the permission to do this? 1=Yes, 2=No	Hemacue Blood reading g/dl	
[The following questions are made to Mother of the child selected throug the sampling process					
Remember to write 1=Yes, 2=No]					
Have you ever heard of night blindness (local term)?					
Did your child ever have dificulty seeing in dim light?					
For instance at dusk or in a dark place?					
Have you ever received a vitamin A capsule like this one for your child? (show VAC to the respondent)					
If yes, when did your child take the last capsule? (Code E3)					
What kind of toilet facility does your household use? (Code E4)					
What is the household's main source of drinking water? (code E5)					
Module F: Income					
Income activities and earnings in the last 6 months					
Following questions to be asked to the mother of the child in relation to all income earning					
members indicated in Module A					
Income	**Member**	**In the past 6 months,**	**How much**		

activity type	I.D. code	how many months		was earned from this activity?		
(code A5)	(Copy from Module A)	was income earned from		(average/month)		
		this activity?				

Q.In the last 6 months, how much income did your household members receive

from the following activities

	Activity			Annual Cash Income (in Cambodian Riels, KHR)		
	Animal Sale					
	Agricultural product sale					
	Animal product sale (eggs, etc)					
	THR sale					

Q. In the last 6 months, did your family receive any income/assistance from the following sources?

In adition to your salary/household production sales. If no, leave it blank and go to the next question

Description			Estimated Earning			
			Annual cash income		Annual in-kind income	
			(in Cambodian Riels, KHR)		(Equivalent in Rhiels)	
Remittances (international)						
Remittances (national)						
International organization/NGO						
Govt. Assistance						
Participation in groups/savings						
Financial organization/Access to credit						
Other Income Sources						

Q. Please tell me how much your household spends per child-at-school on each of the listed items					
Items		**Estimated annual expenses 2009**		**Have you ever encounter**	
		(in Cambodian Riels, KHR)		**dificulties covering these costs?**	
				Code F1	
Materials and books					
Uniforms					
Boarding fees					
Other expenses					
related to education					
MODULE G: Household assets					
Q. Please list how many of the following assets are owned by the household					
Asset		**Number of assets owned by the household**			
		(including assets shared with other			
		households but not the entire community)			
Productive Assets					
Agricultural land (in M2)					
Rice miller					
Hand hammer mill					
Plough					
Hoe					
Axe					
Cart					
Hand tractor					
Tractor					
River irrigation system					
Sewing machine					
Buffalo					
Cow					
Pig					
Chicken					
Non-Productive Assets					
Tin roof (house)					
Durable					

walls					
Television					
Radio					
Bicycle					
Motorbike					
Car					
Cell phone					
Bed					
Table					
Chair					
Metal cooking pot					
Water collecting and storage bin					

MODULE H: Household Food Security

Household Food Security

[Please ask the following questions to the Head of the household, mother or any other adult women]

Answer 1= Yes, 2 = No, Unless otherwise required

1	In the past 30 days, did you worry that your household would not have enough food?		
1a	If yes, how often did this happen? 1 = Rarely (once or twice in the past 30 days 2 = Sometimes (three to ten times in the past 30 days) 3 = Often (more than ten times in the past 30 days)		
2	In the past 30 days, were you or any of your family 0 = No (skip to Q3) not able to eat the kinds of foods you would like to eat, such as fish, beef, pork or sweets etc, because you were not able buy, grow or raise enough of these foods?		
2a	If yes, how often did this happen? 1 = Rarely (once or twice in the past 30 days 2 = Sometimes (three to ten times in the past 30 days) 3 = Often (more than ten times in the past 30 days)		
3	In the past 30 days did you or any of your family have to eat only a few foods, such as only rice with prahok or rice with fish sauce or rice with salt etc, due to not being able to buy or grow enough other foods?		
3a	If yes, how often did this happen? 1 = Rarely (once or twice in the past 30 days 2 = Sometimes (three to ten times in the past 30 days) 3 = Often (more than ten times in the past 30 days)		
4	In the past 30 days did you or any of your family have to eat some foods that you really did not want to eat, such as broken rice, roots (kdourch), banana stalsk etc, because you were unable to buy, catch or grow enough other foods?		

4a	If yes, how often did this happen?		
	1 = Rarely (once or twice in the past 30 days		
	2 = Sometimes (three to ten times in the past 30 days)		
	3 = Often (more than ten times in the past 30 days)		

5   In the past 30 days did you or any of your family have to eat less at a meal (e.g. have a smaller breakfast or smaller dinner) than you felt you needed because there was not enough food?

5a	If yes, how often did this happen?		
	1 = Rarely (once or twice in the past 30 days		
	2 = Sometimes (three to ten times in the past 30 days)		
	3 = Often (more than ten times in the past 30 days)		

6   In the past 30 days did you or any other family member have to eat fewer meals (e.g. eat less than 3 meals) in a day because there was not enough food?

6a	If yes, how often did this happen?		
	1 = Rarely (once or twice in the past 30 days		
	2 = Sometimes (three to ten times in the past 30 days)		
	3 = Often (more than ten times in the past 30 days)		

7   In the past 30 days was there ever no food to eat of any kind in your house because you had run out of food stores and had no way to get more?

7a	If yes, how often did this happen?		
	1 = Rarely (once or twice in the past 30 days		
	2 = Sometimes (three to ten times in the past 30 days)		
	3 = Often (more than ten times in the past 30 days)		

8   In the past 30 days did you or any household member go to sleep at night hungry because there was not enough food?

8a	If yes, how often did this happen?		
	1 = Rarely (once or twice in the past 30 days		
	2 = Sometimes (three to ten times in the past 30 days)		
	3 = Often (more than ten times in the past 30 days)		

9   In the past 30 days did you or any household member go a whole day and night without eating anything because there was not enough food?

9a   If yes, how often did this happen?

1 = Rarely (once or twice in the past 30 days

2 = Sometimes (three to ten times in the past 30 days)

3 = Often (more than ten times in the past 30 days)

MODULE I: Other effects of school feeding

QJ1. When your children go to school, does anyone in your household save time?

QJ2. If yes, who? *(Code J1)*

QJ3. If yes, from which activity? *(Code J2)*

QJ4. If yes, how much time do you save? *(hours per day)*

QJ5. If yes, how do you use this time? *(You can choose 2 activities)*

Activity 1

Activity 2

QJ6. When your children go to school, is it consumming for anyone in your household?

QJ7. If yes, who? *(Code J1)*

QJ8. If yes, which activities must be done?

(You can choose 2 activities)

Activity 1

Activity 2

QJ9. If yes, how much time? *(hours per day)*

Thank you!

World Food Programme, Kingdom of Cambodia
Household Survey Questionnaire
CODING FOR ENNUMERATORS

Code list SUMMARY 1

1= less than 15 minutes

2= 15 minutes to 30 minutes

3= 30 minutes to 45 minutes

4= 45 minutes to 1 hour

5= More than 1 hour

Code list MODULE A

Code A1: Relationship with household head			*Code A4: Main occupation*	
Household head	*1*		*Household Ag/Livestock*	
Husband/wife	*2*		*Farming activities*	*1*

Son/daugther	3		Pastoral activities	2
Brother/sister	4		Fishing activities	3
Father/mother	5		**Unskilled casual labour**	
Uncle/aunt	6		Agricultural labour	4
Father/mother-in-law	7		Non-agricultural labour	5
Grandson/daughter	8		**Skilled labour**	
Niece/nephew	9		Tailor/potter/blacksmith/	6
Cousin	10		goldsmith/hair cutter/	
Other relative	11		cobbler/carpenter/mason	
Permanent servant	12		plumber/electrician/	
Other non-relative	13		motor mechanic	

Left column:

Son/daugther — 3
Brother/sister — 4
Father/mother — 5
Uncle/aunt — 6
Father/mother-in-law — 7
Grandson/daughter — 8
Niece/nephew — 9
Cousin — 10
Other relative — 11
Permanent servant — 12
Other non-relative — 13

Code A2: Martial status code

Unmarried (never married)	1
Married (monogamous)	2
Widow/widower	3
Divorced/Separated	4
Deserted	5

Code A3: Highest education class

Register number of highest completed
class in primary school. Otherwise use the
following coding

Never attended school	99
Still in grade 1	98
Completed grade 1	1
Completed grade 2	2
Completed grade 3	3
…. Etc	…
Completed secondary sch.	12

Right column:

Pastoral activities	2
Fishing activities	3
Unskilled casual labour	
Agricultural labour	4
Non-agricultural labour	5
Skilled labour	
Tailor/potter/blacksmith/	6
goldsmith/hair cutter/	
cobbler/carpenter/mason	
plumber/electrician/	
motor mechanic	
Permanent salaried worker	
Government	7
Private sector employee	8
NGO worker	9
Driver	10
Other salaried worker	11
Profesional	
Doctor/engineer/lawyer	12
Teacher	13
Religious worker	14
Midwife/nurse	15
Micro/small scale industry	
Food processing	16
Handcrafts	17
Sand harvester	18
Charcoal production	19
Brewing	20
Trader/business	
Petty trader	21

Diploma	14
BA/BSc pass	16
MA/MSc and above	18
Preschool class (general)	97

Business/shop	22
Medium/large scale trader	23
Contractor	24

Non-earning occupation

Student	25
Housewife	26
No occupation	27

Code list for MODULE B

Code B1: Location of previous household members

Capital PP	1
Same Town	2
Same Village	3
Outside Cambodia	4
Other Province	5

Code B2: Help to household or community

Helps household financially or in other way	1
Helps community financially or in other way	2
Both of the above	3
No help to neither	4

Code list for MODULE C

Code C1: Important contributing reasons

Good teachers	1
Parents' encouragement	2
Child's ambition	3
Meals available at school	4
Positive learning environment/role model	5
Boarding facilities in the school	6
Good academic performance of the child	7
Firendly school conditions for the child	8
Take home rations	9
Other	10

Code C3: Reason for never/stop attending school

No school available	1
No food at school	2
Completed desired schooling	3
Insufficient economic resources to cover costs	4
Household labour/taking care of siblings/elders	5
Marriage	6
Poor academic progress	7
Long distance to school	8
Safety concerns	9
Paid labour	10
Other	11

Code C4: Type of

	support	
Financial		1
Food		2
Other in-kind		3
No support at all		4

Code list for MODULE D

CODE D1	Code D2	Code D3
1 = Other household members	1 = Yes, usually	1 = To buy food
2 = Family outside the household	2 = Yes, sometimes	2 = To buy non productive assets
3 = Friends/neighbours/other	3 = No, never	3 = To buy clothes
4 = I don't share my THR		4 = Health expenditures
		5 = To buy other things
		6 = To invest in a productive activity
		7=Education expenditures

CODE D4		Code D5
1= Yes	4= No, I don't like it	1= Every day
2= No, its not available everyday	5= No, I don't have time to eat it	2= 3-4 days a week
3= No, its not offered to me	6= No, I'm not hungry	3= 1-2 days a week
		5= Never
7= No, I like to take some of it home to my family	8= Other	4= Rarely

Code list for MODULE E

Code E1		Code E2		
1=Yes, at school		99= No illness	3 = Fever	6 = Other
2= Yes, at the health centre		1 = Diarrhoea	4 = Cough	
3= No		2 = Vomiting	5 = Measles	

Code E3	Code E4	
1 = Less than 6 months	1. closed latrine	4. bush/open field
2 = More than 6 months	2. open latrine	5. other, specify
9 = Don't know	3. river/pond side	

Code E5

1. *Pond/river/canal*	6. *Tapped water*
2. *Open ringwell*	7. *Rain water*
3. *Closed ringwell*	8. *Bought water*
4. *Open spring*	9. *Hand dug (no ring)*
5. *Handpump*	10. *Other*

Code list for MODULE F

Code F1

1 = Yes, usually	*2 = Yes, sometimes*	*3 = No, never*

Code list for MODULE J

Code J1	*Code J2*	*Code J3*
1 = Men	*1 = Preparing food*	*1 = Household chores*
2 = Women	*2 = Taking care of children*	*2 = Rest/Leisure*
3 = Both	*3 = Both*	*3 = Income-earning activity*
	4 = Other	*4 = Farm/livestock work*
		5 = Child care
		6 = Other

Code J4

1 = Taking the child to school
2 = Helping the child with the homework
3 = Meetings with teachers/school staff
4 = Preparing school material (books/clothes)
5 = Doing tasks that are usually done by the child

F. Other Technical Working Papers and Annexes

G1. School Feeding Policy Framework –Relevant Levels (input)

			SAFETY NET		
INPUT	**OUTPUT**	**TYPE OF OBJECTIVES**	**OUTCOMES**	**IMPACTS**	
MICRO-NUTRIENT FORTIFIED MEALS, SNACKS, TAKE-HOME RATIONS WITH DE-WORMING	NUMBER OF CHILDREN FED, RATIONS AND DE-WORMING TABLETS DISTRIBUTED, SCHOOLS REACHED	*Nutrition*	Improved micronutrient status of school children *Indicator: Prevalence of iron deficiency anaemia* Improved calory and protein intake *Indicator: Kcal transferred to schoolchildren*	Enhanced nutrition and child health, increased learning, decreased morbidity	C Y C L E O F H U N G E R I N T E R R U P T E D
		Education	Increased enrolment **Indicator**: *Enrolment: average annual rate of change in number of boys/girls enrolled* Increased attendance **Indicator**: *Attendance Rate* Increased retention/Decrease in school dropout **Indicator**: *Retention rate/Dropout rate* Improved school achievement *Indicator: Promotion rate* Short term hunger alleviated leading to improved child cognition *Indicator: Teachers' perception of children's ability to concentrate and learn in class* Completion of basic education **Indicator**: *Pass Rate*	Improved learning Increased HH human and financial capital Increased lifetime earnings of targeted children Increased access to education for girls and OVCs Decrease in maternal and infant mortality rates Increased awareness on family planning, fewer and healthier children	
		Gender	Increased gender equality in education **Indicator**: *Gender ratio: ratio of girls to boys enrolled*	Decreased HIV/AIDS prevalence Inter-generational effects - positive influence of more educated parents on children growth	
MICRO-NUTRIENT FORTIFIED MEALS, SNACKS, TAKE-HOME RATIONS WITH DE-WORMING	NUMBER OF HOUSEHOLDS BENEFITING FROM SCHOOL FEEDING	*Value Transfer*	Increased household income *Indicator: Monetary value of food transferred* Improved household food consumption Indicator: Household food consumption score	Improved food security Increased investments in HH productive assets Improved health/nutrition status of non-school going children and other household members Decrease in reliance on negative coping mechanisms Decrease in child labour participation	
COMPLE-MENTARY ACTIVITIES	LOCAL PROCUREMENT ESSENTIAL PACKAGE	*School Feeding as a Platform for Complementary Activities Providing Wider Socio-Economic Benefits*	Increased farmer income and marketing opportunities with local procurement and processing for school feeding *Indicator: Food for school feeding purchased locally, as % of food distributed for school feeding in-country* Essential Package interventions at school (safe water, fuel-efficient stoves, woodlots) promoted *Indicator: Proportion of schools with assets in place* School infrastructure (schools, school kitchens, access roads) promoted *Indicator: Proportion of schools with school assets in place*	Food assistance transformed into a productive investment in local communities - Improved local economies Wider socio-economic benefits (reduced fuelwood consumption and carbon footprint, improved school infrastructure, improved education environment)	

G2. Pipeline breaks since 2006

Year of letter issued	Subject	Activity		Effective Period	Observations
		SMP	THR		
2006	Pipeline break and shortage of food commodities	☐		March to end July 2006	Reduced fish from 20 to 10g
		☐		Mar to June 2006	Reduced fish YSP from 40 to 20g
		☐	☐	Oct-Nov 2006	No oil for SMP and postpone of THR
		☐		Nov-Dec 2006	Reduced fish from 20 to 10g
2007	Pipeline break and postpone of food distribution	☐	☐	Jan -Apr2007	No food delivery for SMP and THR
2008	Pipeline break in WFP food distributions	☐		April -May 08	No food delivery for SMP and THR
2008	Pipeline break in WFP food distributions	☐		May -Jul 2007	THR receives full package for this period
2008	Resumption of food to SMP			16 Jun -05 Jul 08	
2009	Reduced Ration	☐	☐	Oct 09 -Jul 10	SMP: reduce oil from 10g to 6 g, and beans from 25 to 15g; THR: no beans
2009	Shortage of canned fish	☐		nov-09	No CFI ration for SMP for 2 weeks period in Nov 09

Source and Elaboration: WFP CO Cambodia

G3. Additional Graphs and Tables

G3-A Average Age of Children at School Start
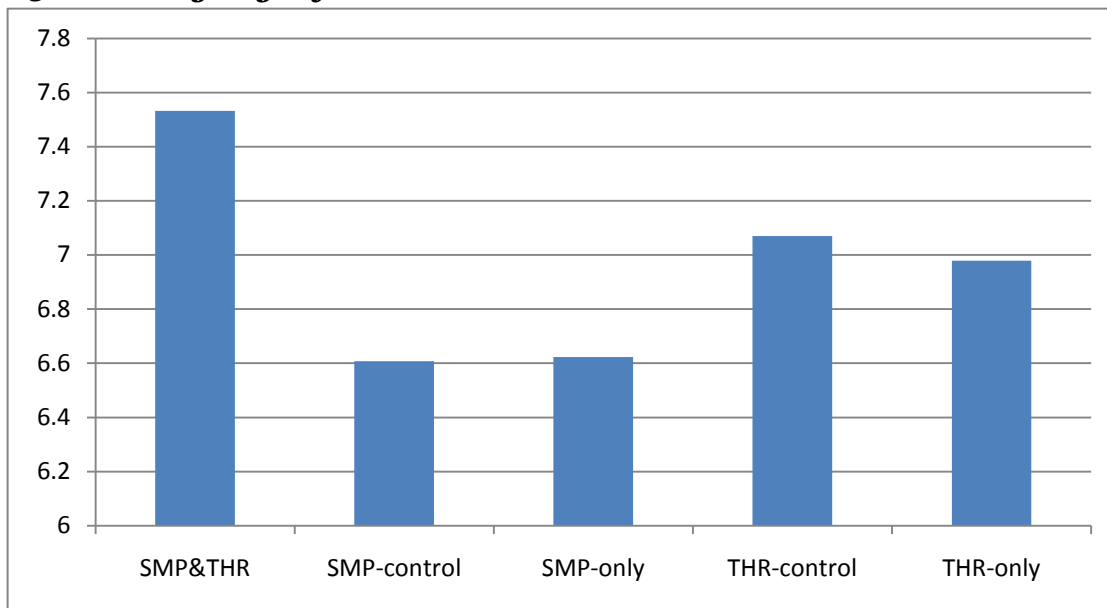
Source: Impact Evaluation – household survey

G3-B Standards Test Scores by Gender, Theme and Province
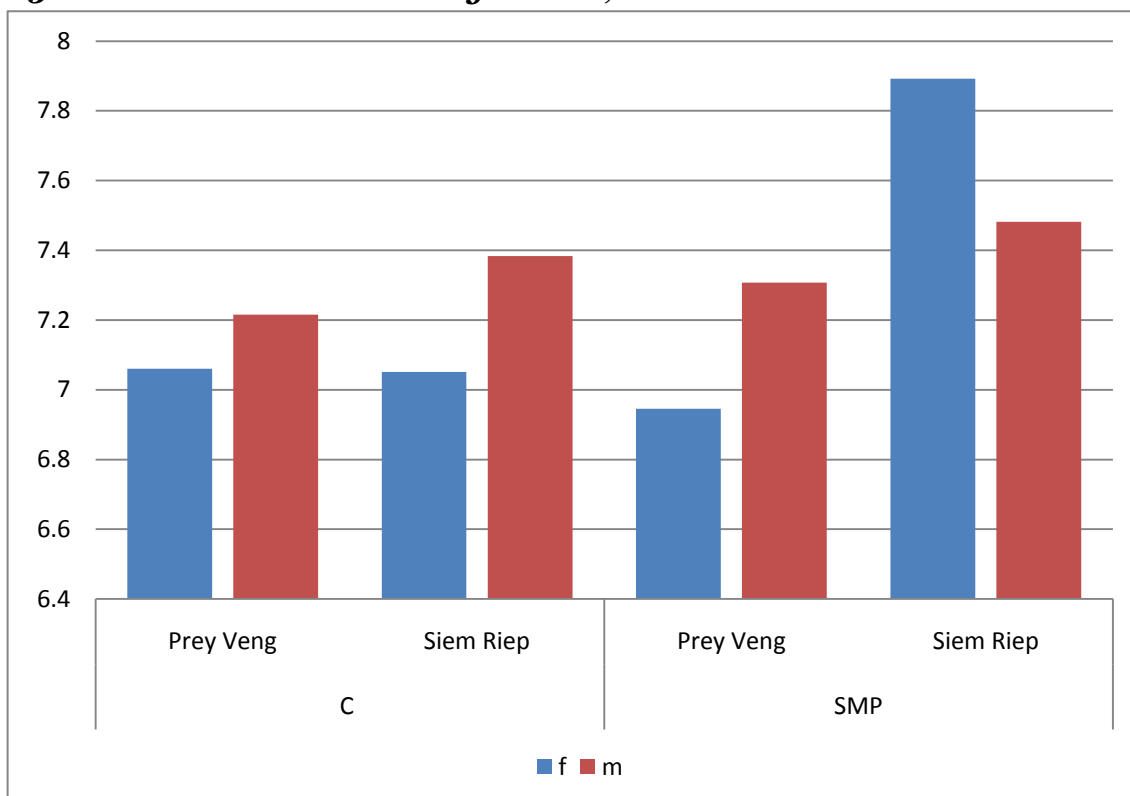
G3-C SMP and THR Beneficiaries: Primary activities of 6 to 18-year-old Rates

SMP Beneficiaries

Legend:
- Agricultural labour
- Business/shop
- Farming activities
- Fishing activities
- Food processing
- Handcrafts
- Housewife
- Medium/large scale trader
- NGO worker
- No occupation

THR Beneficiaries
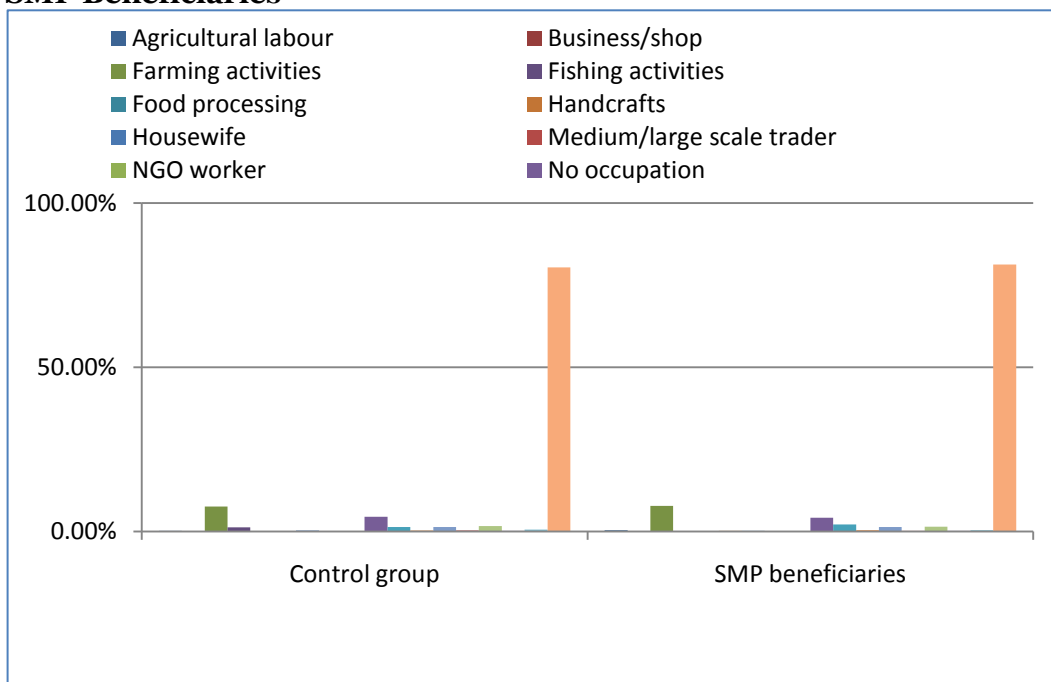
Legend:
- Agricultural labour
- Farming activities
- Fishing activities
- Housewife
- No occupation
- Non-agricultural labour
- Other salaried worker
- Pastoral activities
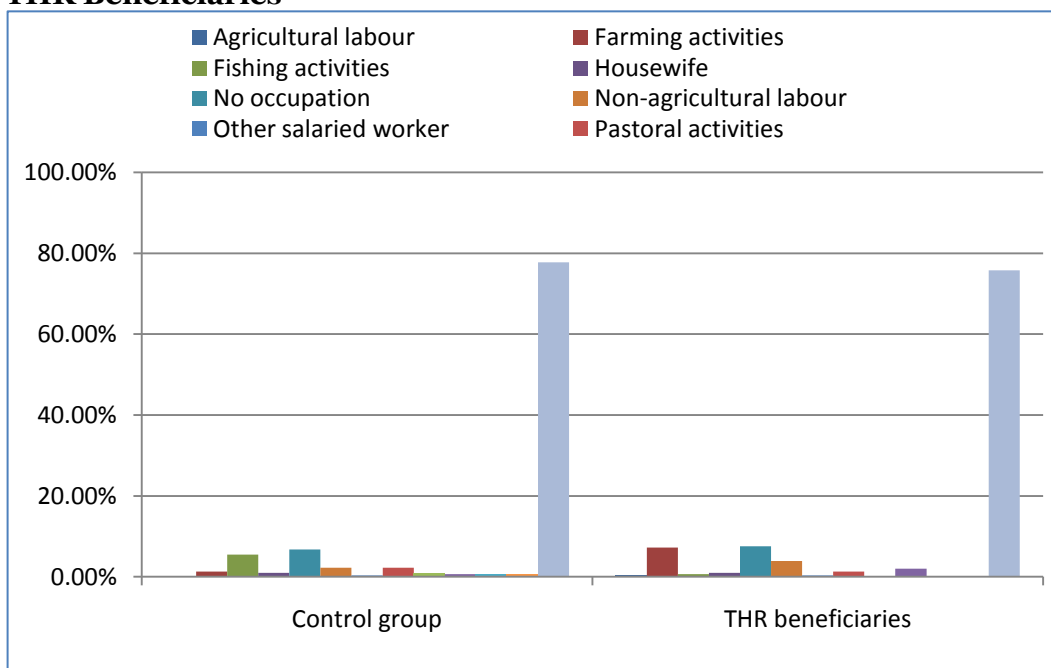
G3-D School Attendance by Strata and CFS

G3-E Population means and 95% confidence intervals for nutrition and health variables

UB= Upper bound

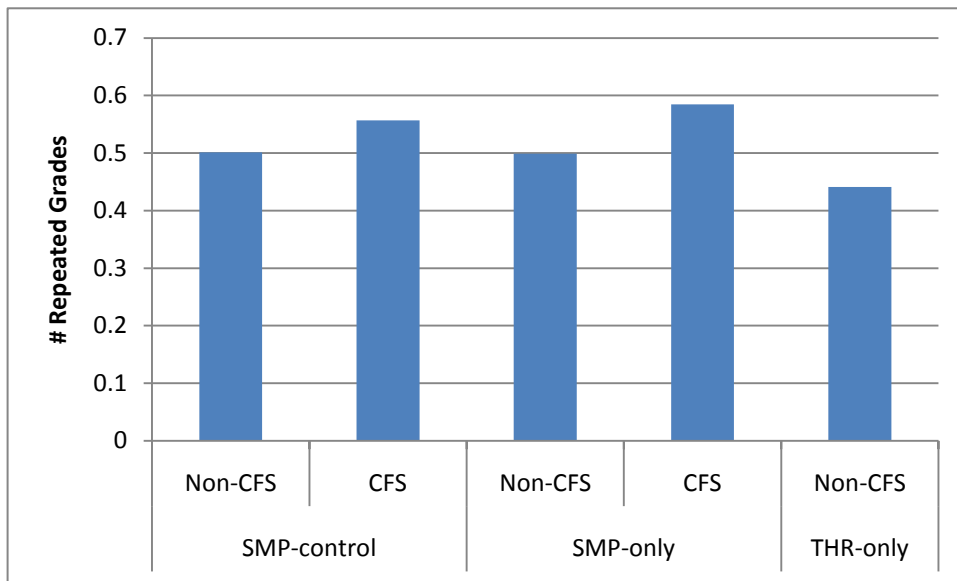| household survey question number and indicator	SMP&THR n=187			SMP-Control n=652			SMP-only n=676		
	LB	Mean	UB	LB	Mean	UB	LB	Mean	UB
E1.4 : MUAC	19.1	19.4	19.7	18.4	18.6	18.8	18.5	18.6	18.8
E1.5 : Presence of bilateral oedema (1=Yes, 0 =No) 18 cases detected out of 2014 children.	- 0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E1.6 : Age (in months)	159	162	165	145	146	148	145	147	149
E1.7 : Has the child been dewormed in the past 6 months (1= yes, 0= no)	0.7	0.7	0.8	0.8	0.8	0.9	0.8	0.9	0.9
E2.2 : Has the child suffered from any illness in the last 2 weeks? (1= yes, 0= no)	0.2	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.3
E2.3 : How many days in this period, has the child been unable to attend school due to illness?	0.9	1.4	2.0	1.0	1.3	1.5	0.8	1.0	1.2
E2.5 : Hemacue blood reading (mg/dl)	10.8	11.0	11.2	11.7	11.8	11.9	11.5	11.6	11.7
E3.1 : Have you ever heard of night blindness (local term)? (1=Yes, 0=No)	0.7	0.7	0.8	0.9	0.9	0.9	0.9	0.9	0.9

	LB	Mean	UB	LB	Mean	UB	LB	Mean	UB
E3.0 : Do any of your children have difficulty seeing in dim light? (1=Yes, 0 =No)	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1
E3.3 : Have you ever received a vitamin A capsule like this one for your child? (1=Yes, 0 =No)	0.7	0.8	0.8	0.6	0.7	0.7	0.7	0.7	0.8
E3.4 : Proportion of children who took capsule within last 6 months	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1
E3.5 : What kind of toilet facility does your household use? (1= latrine, 0= other)	0.0	0.1	0.1	0.3	0.3	0.3	0.2	0.2	0.2

	THR-Control n=100			THR-only n=399		
	LB	Mean	UB	LB	Mean	UB
E1.4 : MUAC	18.3	18.7	19.1	18.6	18.8	19.0
E1.5 : Presence of bilateral oedema (1=Yes, 0 =No)	-0.0	0.0	0.0	-0.0	0.0	0.0
E1.6 : Age (in months)	149	153	157	150	152	154
E1.7 : Has the child been dewormeed in the past 6 months (1= yes, 0= no)	0.5	0.6	0.7	0.7	0.7	0.8
E2.2 : Has the child suffered from any illness in the last 2 weeks? (1= yes, 0= no)	0.3	0.4	0.5	0.3	0.3	0.4

E2.3 : How many days in this period, has the child been unable to attend school due to illness?	1.1	1.8	2.6	0.8	1.1	1.4
E2.5 : Hemacue blood reading (g/dl)	10.7	11.0	11.3	11.2	11.3	11.4
E3.1 : Have you ever heard of night blindness (local term)? (1=Yes, 0=No)	0.7	0.8	0.9	0.8	0.8	0.9
E3.0 : Do any of your children have difficulty seeing in dim light? (1=Yes, 0 =No)	0.0	0.1	0.1	0.0	0.1	0.1
E3.3 : Have you ever received a vitamin A capsule like this one for your child? (1=Yes, 0 =No)	0.5	0.6	0.7	0.6	0.6	0.7
E3.4 : Proportion of children who took capsule within last 6 months	-0.0	0.0	0.1	0.1	0.1	0.1
E3.5 : What kind of toilet facility does your household use? (1= latrine, 0= other)	0.2	0.3	0.3	0.1	0.1	0.2

G3-F Sufficiency of Rations

SMP		ENERGY	PROTEIN	FAT	CALCIUM	IRON	IODINE	VIT. A	THIAMINE	RIBOFLAVIN	NIACIN	VIT. C
		kcal	g	g	mg	Mg	µg	µg RE	mg	mg	mg NE	mg
Requirements for 10-14 year olds		2,210	50.0	42.1	600	24.0	140.0	550	0.90	1.50	14.6	25
	/p/school day	593	16.4	15.6	111	4.3	184	90	0.31	0.15	8.4	0
Planned ration as % or requirements		27	33	37	19	18	131	16	34	10	58	0
*days/yr	/p/yr	118600	3280	3120	22200	860	36800	18000	62	30	1680	0
Av rec'd over year	/p/day	325	9	9	61	2	101	49	0	0	5	0
Av rec'd/day at 2 shift school	/p/day	162	4	4	30	1	50	25	0	0	2	0

		ENERGY	PROTEIN	FAT	CALCIUM	IRON	IODINE	VIT. A	THIAMINE	RIBOFLAVIN	NIACIN	VIT. C
Av rec'd/day at 2 shift school as % requirements		7.35	9	10	5	5	36	4	9	3	16	0
Av rec'd/day at 1 shift school		325	9	9	61	2	101	49	0	0	5	0
Av rec'd/day at 1 shift school as % requirements		15	18	20	10	10	72	9	19	5	32	0
		ENERGY	PROTEIN	FAT	CALCIUM	IRON	IODINE	VIT. A	THIAMINE	RIBOFLAVIN	NIACIN	VIT. C
THR		kcal	g	g	mg	Mg	µg	µg RE	mg	mg	mg NE	mg
Requirements for 10-14 year olds		2,210	50.0	42.1	600	24.0	140.0	550	0.90	1.50	14.6	25
	/benficiary family/school month	69550	1450	1099	4210	419	0	9000	25	8.9	960.3	0
* 7 months	/benficiary family/year	486850	10150	7693	29470	2933	0	63000	175	62.3	6722.1	0
/ by 12 months	/beneficiary family/month	40571	846	641	2456	244	0	5250	15	5	560	0
/by 30 days	/beneficiary family/day	1352	28	21	82	8	0	175	0	0	19	0
/child/day. Divide by household size 5.7	/child/day	237	5	4	14	1	0	31	0	0	3	0
SMP + THR		ENERGY	PROTEIN	FAT	CALCIUM	IRON	IODINE	VIT. A	THIAMINE	RIBOFLAVIN	NIACIN	VIT. C
		kcal	g	g	mg	Mg	µg	µg RE	mg	mg	mg NE	mg
Requirements for 10-14 year olds		2,210	50.0	42.1	600	24.0	140.0	550	0.90	1.50	14.6	25
At 2 shift school	/child/day	400	9	8	45	3	50	55	0	0	6	0
At 1 shift school	/child/day	562	14	12	75	4	101	80	0	0	8	0

		ENERGY	PROTEIN	FAT	CALCIUM	IRON	IODINE	VIT. A	THIAMINE	RIBOFLAVIN	NIACIN	VIT. C
SMP ration accounting for pipeline since mid 2008		kcal	g	g	Mg	mg	µg	µg RE	mg	mg	mg NE	mg
Requirements for 10-14 year olds		2,210	50.0	42.1	600	24.0	140.0	550	0.90	1.50	14.6	25
Planned ration /p/school/day		539	14.2	13.2	93	3.4	184	72	0.25	0.12	7.7	0
Planned ration as % or requirements		24	28	31	16	14	131	13	28	8	53	0

		ENERGY	PROTEIN	FAT	CALCIUM	IRON	IODINE	VIT. A	THIAMINE	RIBOFLAVIN	NIACIN	VIT. C
Planned ration /p/year (*200 days)	/year	107800	2840	2640	18600	680	36800	14400	50	24	1540	0
Av rec'd over year (/365) p/day	/p/day	295	8	7	51	2	101	39	0	0	4	0
Av rec'd/day at 2 shift school	/p/day	148	4	4	25	1	50	20	0	0	2	0
Av rec'd/day at 2 shift school as % requirements		6.68	8	9	4	4	36	4	8	2	14	0
Av rec'd/day at 1 shift school		295	8	7	51	2	101	39	0	0	4	0
Av rec'd/day at 1 shift school as % requirements		13	16	17	8	8	72	7	15	4	29	0
THR		ENERGY	PROTEIN	FAT	CALCIUM	IRON	IODINE	VIT. A	THIAMINE	RIBOFLAVIN	NIACIN	VIT. C
		kcal	g	g	Mg	mg	µg	µg RE	mg	mg	mg NE	mg
Planned ration/family/school month		66200	1250	1087	2780	337	0	9000	20	6.7	898.3	0
* 7 months	/benficiary family/year	463400	8750	7609	19460	2359	0	63000	140	46.9	6288.1	0
/ by 12 months	/beneficiary family/month	38617	729	634	1622	197	0	5250	12	4	524	0
/by 30 days	/beneficiary family/day	1287	24	21	54	7	0	175	0	0	17	0
/child/day. Divide by household size 5.7	/child/day	226	4	4	9	1	0	31	0	0	3	0

		ENERGY	PROTEIN	FAT	CALCIUM	IRON	IODINE	VIT. A	THIAMINE	RIBOFLAVIN	NIACIN	VIT. C
Av rec'd/day THR as % requirements		10	9	9	2	5	0	6	8	2	21	0
SMP + THR								µg RE			mg NE	
		kcal	g	g	Mg	mg	µg		mg	mg		mg
At 2 shift school	/child/day	373	8	7	35	2	50	50	0	0	5	0
Av rec'd/day SMP + THR as % requirements		17	16	17	6	9	36	9	15	4	35	0
At 1 shift school	/child/day	521	12	11	60	3	101	70	0	0	7	0
Av rec'd/day SMP + THR as % requirements		24	24	26	10	13	72	13	23	6	50	0

G3-G Consumption Comparisons Vitamin A and Iron Rich Foods

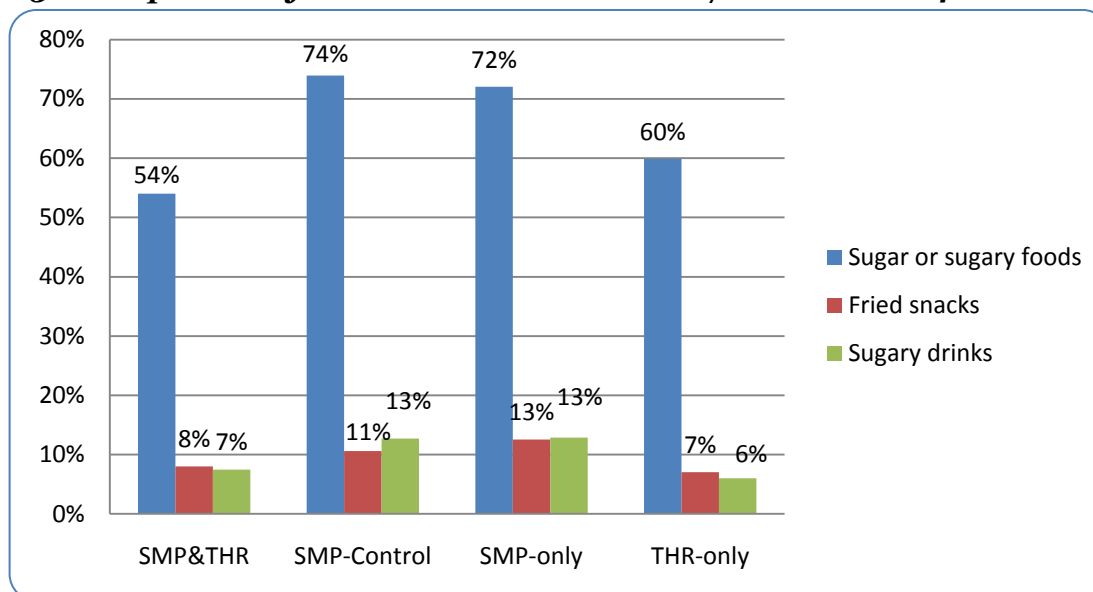## Comparison of the consumption of vitamin A rich food by boys in SMP and SMP-control
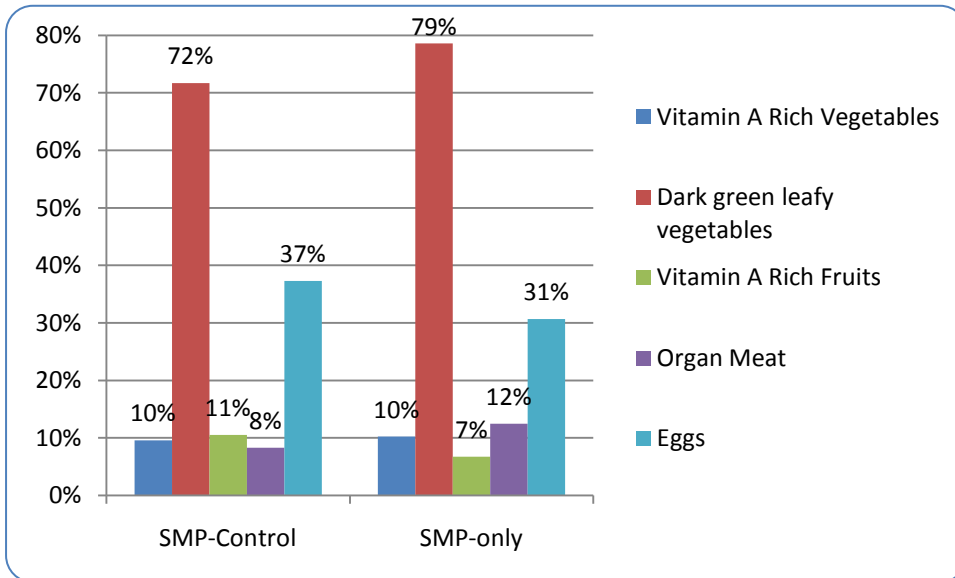
Comparison of the consumption of iron rich food by boys in SMP and SMP-control
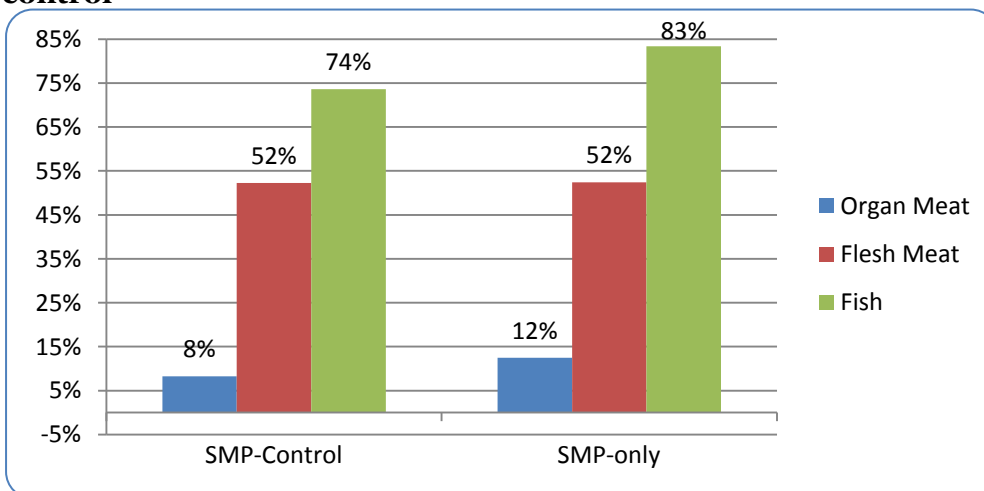
Reported Night Blindness
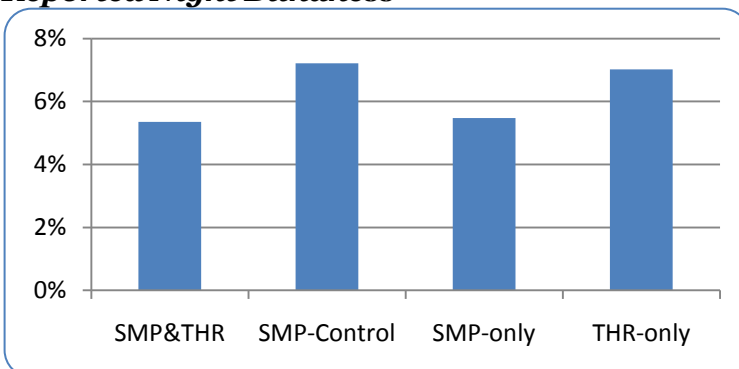
G3-H Proportion of Children Who Had Snacks/Sweets Last 24 Hours

G3 – I Summary of Statistically Significant Results from household-survey

| Effect of receiving SMP	Matching model (Model ATT in the methodology section.		
	Girls, n=732	Boys, n=634	All, n=1366
Dietary diversity, IDDS score	0.65 SE 0.12, t-value 5.6	0.96 SE 0.15, t-value 6.6	0.77 SE 0.1, t-value 7.8
Weight, kg	1.21 SE 0.40, t-value 3.07	-0.24 SE 0.50, t-value -0.47	0.54 SE 0.32, t-value 1.66
Height, cm	1.56 SE 0.54, t-value 2.91	-1.18 SE 0.69, t-value -1.70	0.26 SE 0.49, t-value 0.54
MUAC	0.26 SE 0.15 t-value 1.76	-0.06 SE 0.15 t-value -0.38	0.12 SE 0.11, t-value 1.14
Reported days absence from school due to illness	-0.33 SE 0.10 t-value -3.18	-0.11 SE 0.10 t-value -1.18	-0.23 SE 0.06 t-value -3.94
Haemoglobin, g/dl	0.13 SE 0.1 t-value 1.31	-0.37 SE 0.11 t-value -3.24	-0.08 SE 0.08, t-value -0.94
Anaemia prevalence[86] [To be updated]	-0.08 SE 0.04 t-value -1.83	0.12 SE 0.04 t-value 3.25	-0.08 SE 0.04, t-value -2.15

Population Means of Nutritional Indices by modality

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[86] Based on WHO cut offs

Programme type		Wt/age	Ht/age	BMI/age
			SD	
SMP-Control	Mean	-1.52	-1.98	-1.42
	N	52	652	645
	Std Deviation	0.89	1.12	1.00
SMP-only	Mean	-1.55	-1.98	-1.34
	N	62	675	668
	Std Deviation	0.97	1.08	0.94
SMP&THR	Mean	-1.96	-2.26	-1.42
	N	5	187	184
	Std Deviation	1.60	1.17	0.97
THR-only	Mean	-1.90	-2.22	-1.47
	N	25	399	395
	Std Deviation	0.86	1.07	1.00
Total population average	Mean	-1.60	-2.06	-1.41
	N	150	2013	1991
	Std Deviation	1.04	1.12	0.98

Source: Evaluation team – household survey
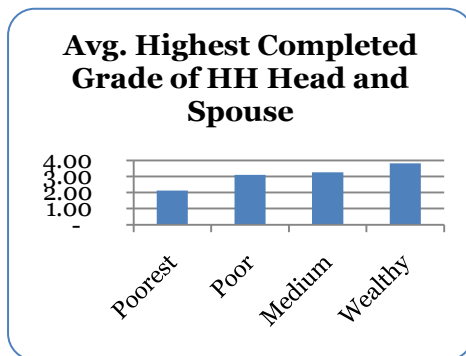
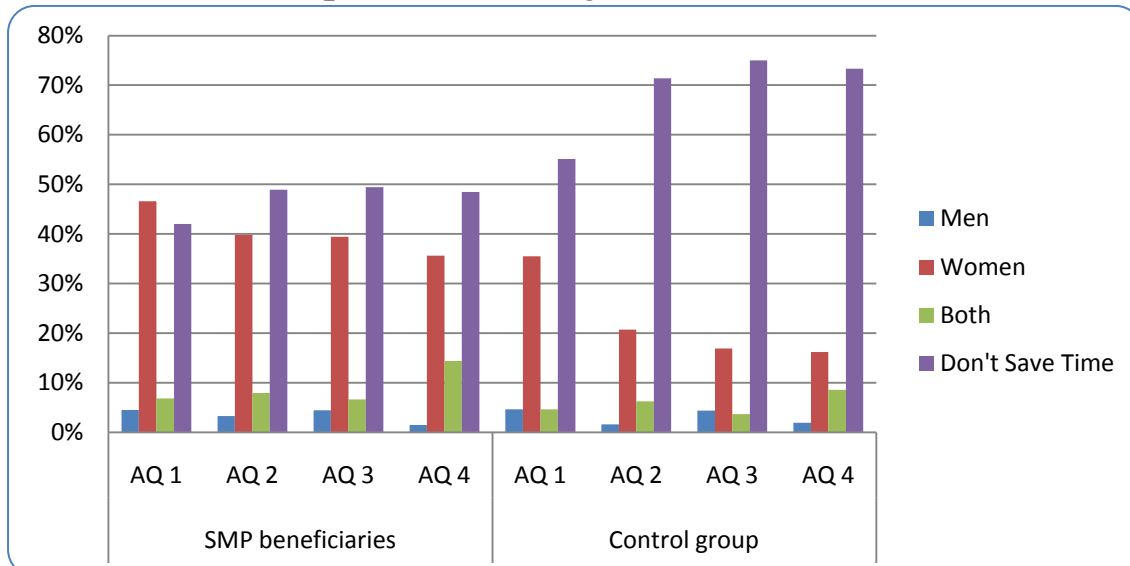## G3-J household Members Education by Asset Class
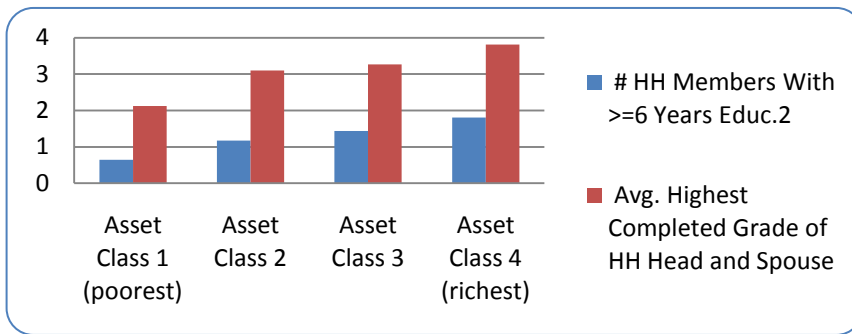
G3-K Education Level of Household Head

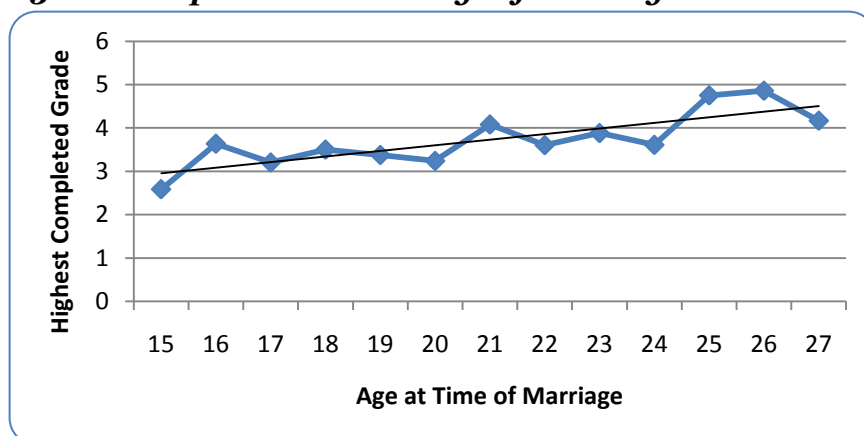Education level of household head

Household average number of adults And spouse and children
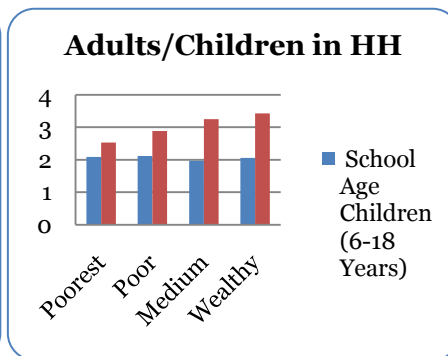
G3−L: Time saved as per SMP modality

G3 – M Completed Class vs. Age of Marriage

G4. The Essential Package

12 interventions to improve the health and nutrition of school-age children[87]

Education is one of the most effective investments in improving economies and creating literate, self-reliant and healthy societies. However, poor nutrition and health among schoolchildren - for example, diminished cognitive abilities and sensory impairments, malnourishment, not being feed before going to school, iodine or iron deficiency anaemia and parasitic worms infections - have an adverse effect on learning. Research and experience show that improving nutrition and health can lead to better performance, fewer repeated grades and reduced dropout.

In April 2000, WHO, UNESCO, UNICEF and the World Bank agreed upon a shared framework – FRESH (Focusing Resources on Effective School Health) – to strength school health, hygiene and nutrition programmes.

Based on the FRESH framework, the essential package includes the following interventions:

1. **Basic education:** improving infrastructure, curriculum development, teacher training, provision of school supplies, advocacy for policies that make basic education a national priority, public information at community level to encourage families to send their children to school.

2. **Food for education:** THR targeted to girls, orphans and other vulnerable children who attend school regularly, in-school meals, Food for Work targeted to teachers or parents engaged in activities to improve schooling outcomes. These interventions can alleviate short-term hunger, improve school enrolment and attendance and increase community involvement in schools.

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[87] Adapted from WFP & UNICEF: The Essential Package – Twelve Interventions to improve health and nutrition of school-age children

3. **Promotion of girls' education:** THR for girls, improved and separate school sanitary facilities for girls, training of more female teachers, UNICEF and WFP joint advocacy and communication efforts, such as the 25 by 2005 Girls' Education and the Go Girls! Education for Every Child campaigns. Girls' education enables them to claim other rights and achieve status in society, such as economic independence and political representation.

4. **Potable water and sanitary latrines:** the objective is to provide each school with clean water supply and separate sanitary facilities for boys and girls.

5. **Health, nutrition and hygiene education:** health and nutrition education focuses on the knowledge, attitudes, values and life skills needed to make the most appropriate health related decisions; safe hygiene behaviour among schoolchildren is important not simply in the immediate school environment, but also due to the opportunities for communication and potential on their families.

6. **Systematic deworming:** health education that promotes good hygiene, adequate sanitation and access to safe water, advocating the role of teachers in health promotion, basic health and nutrition services, deworming campaigns.

7. **Micronutrient supplementation:** WFP provides foods fortified with micronutrients to improve the nutritional status of schoolchildren.

8. **HIV and AIDS education:** the best way to deal with HIV and AIDS is through prevention by developing and/or changing behaviour and attitudes. UNICEF and WFP support sexual and reproductive health education and life skills programmes.

9. **Psychosocial support:** growing children need more than just basic material provision (food, shelter and clothing). A healthy psychosocial environment – social stimulation, nurturing, affectionate, opportunities for rest and recreation, guidance from stable caring adults - provides support to teachers, students and their families.

10. **Malaria prevention:** skills-based health education enables children to recognize the signs and symptoms of malaria and the need to seek treatment; it also promotes a community-wide understanding of malaria and the need for control measures such as the impregnated treated nets.

11. **School gardens:** they complement school feeding programmes for the learning opportunities they offer and their production function.

12. **Improved stoves:** installation of energy-efficient kitchen stoves in schools can improve children's and teacher's health and prevent negative environmental impacts.

G5. Comments on the WFP's Eight Guiding Standards

#	Type	Findings
1	Sustainability	There is currently no transition strategy in place. See also recommendation III
2	Alignment	The poverty strategies and sector plans for education does not specifically relate to school feeding. See also recommendations I and II
3	Stable Funding and Budgeting	There is no specific funding available for school feeding. Donor funding for the sector is stable, but does not contemplate school feeding interventions. See also recommendation III
4	Needs based, cost-effective design	Most of these standards are met, but they can be improved in terms of purpose, targeting and by introducing micronutrient fortification (on the planning stage). See recommendation III and VII
5	Strong institutional arrangements	There is not a strong institutional arrangement in place and the criteria under this standard are not met. See recommendation III.
6	Strategy for Local production and sourcing	Cambodia has potentials for strengthening local procurement through the purchase for progress initiative. The majority of food used for the operations is purchased in Cambodia. Supply of food is unstable due to irregular donor support.
7	Strong partnership and inter-sector coordination	There are linkages to other areas related to health, nutrition and social protection, but there is still room for some improvement, especially in relation to programme purpose. See recommendation I and II.
8	Strong community participation and ownership	While communities were not involved in design of programme, their participation has improved over time and there is commitment to the programme. There are some contributions to the programme (vegetables) but still of relatively little significance.

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