

**KAMPUCHEAN ACTION FOR PRIMARY EDUCATION  
(KAPE)**



**Optimizing Stakeholder Perceptions of  
Micronutrient Sprinkles In School Feeding**

**Final Report**

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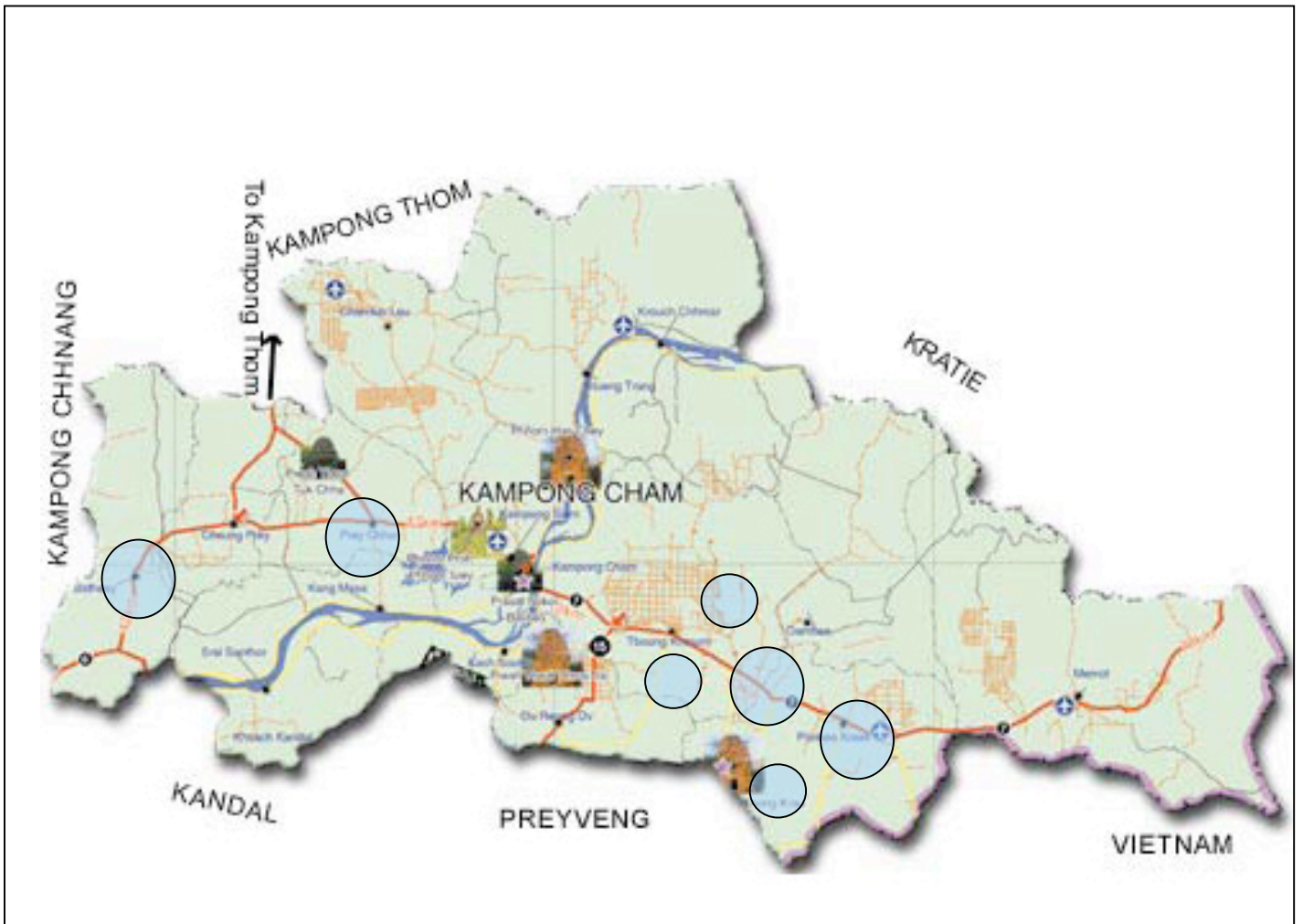
## LIST OF ABBREVIATIONS

KAPE:	Kampuchean Action for Primary Education
MoEYS:	Ministry of Education, Youth, and Sport
MS:	Micronutrient Sprinkles
SBP:	School Breakfast Program
WFP:	World Food Program

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## MAP OF KAMPONG CHAM



Indicates pilot areas

## **1. BACKGROUND**

The present report marks the conclusion of research activities conducted by Kampuchean Action for Primary Education on local perceptions of micronutrient sprinkles (MS), a new intervention being considered for countrywide implementation. The World Food Program contracted KAPE, a local Cambodian NGO, to undertake the present research study in order to determine how the use of micronutrient sprinkles might affect stakeholders' perception of the School Breakfast Program (SBP), a flagship program operated by WFP in hundreds of primary schools in Cambodia. Relatedly, the study sought to determine the degree to which children might be receptive to MS consumption. The study also sought to assess the different modes of implementation adopted by schools participating in the study in order to identify possible problems that might affect overall implementation. These problems related to modes of storage, security, distribution, and disposal of sachets. The study gathered data from stakeholders during the 2006/07 academic year, which began in October 2006. Data collection by the KAPE research team occurred mainly in Kampong Cham Province, as this is the province where KAPE is based and where it implements the School Breakfast Program in collaboration with WFP and government. WFP piloted the introduction of micronutrient sprinkles in ten primary schools in the province, which KAPE is currently monitoring.

The actual distribution of the sprinkles is integrated into the general preparation of the School Breakfast Program, which consists of rice, fish, and vegetables (the latter is provided by the community). MS packets are distributed to students by school staff members on a daily basis as food is being served. Although the total volume of powder contained in each packet is very small, its nutrient content is highly potent. The powder has been formulated in a way to make it as colorless and tasteless as possible. When the packets are opened, the powder is white in color, but after placing it on the food it blends into the color of the food. Students are instructed to sprinkle the contents of the MS packets on their food and to dispose of the residual wrapping properly.

As part of the implementation of the research design, KAPE organized a number of activities to raise awareness among stakeholders about what micronutrient sprinkles are and why they are helpful for children's development. Accordingly, orientations occurred early in the school year. The materials used to develop the structure and content of these orientations included resource documents on nutrition published by WFP as well as some developed by Ministry. Topics covered in orientations included general topics of nutrition (e.g., the basic food groups), diseases that result from lack of nutrition, and how micronutrient sprinkles can help children's bodies and minds.

Data collection for the research occurred in two stages. The first stage focused mainly on establishing a baseline relating to early perceptions of the use of micronutrient sprinkles in each school. This involved gauging preliminary perceptions of relevant stakeholders during the first academic semester, which ended in January 2007. Following the finalization of questionnaires and stakeholder orientations, research team members began the process of actual interviews in December 2006 to January 2007. Research team members visited each school several times in order to collect baseline data. Following the completion of data collection activities, data was entered into SPSS matrices for analysis in February and March 2007. These activities led to the compilation of an Interim Report that was submitted to WFP in April 2007. A second stage of data collection occurred at the end of the academic year in May and June 2007 leading to the compilation of the Final Report currently being submitted.

## 2.1 RESEARCH DESIGN AND METHODOLOGY

### 2.1 Research Variables

Research variables identified for the study include the seven factors listed in Table 2.1. Particular emphasis has been placed on those variables relating to perceptions of the target intervention (i.e., micronutrient sprinkles), awareness

of its benefits, and its perceived effect on important indicators of school efficiency such as drop-out and attendance (see Factors E and G). Reviewing the logistics of organizing the activity was also considered to be important in so far as this might have had some effect on the activity's effectiveness and by extension on stakeholders' overall impressions of the intervention. Factors studied in this respect focused on how the sprinkles were stored, transported, and distributed as well as what happened to the satchels when they were disposed of (see Factors A, B, C, D, and F). Key informants identified by the research team included government officials at district level, school directors, teachers, cooks, community members, and children. KAPE monitoring activity spanned the entire school year.

A	Storage of Sprinkles
B	Transport
C	Awareness/Understanding about Preparation
D	Distribution Process
E	Perceptions of stakeholders
F	Disposal of Sachets
G	Sensitization to Process of Introducing Sprinkles/ Dissemination

### 2.2 Sample Construction

In developing the sample of schools, the research team had to diverge in some ways from the parameters originally proposed. The main point of divergence related to the decision to avoid the selection of annex schools as most of these schools do not have school directors. This in turn had an effect on sample characteristics relating to school size as most annex schools tend to be small with much less than 500 children. To be sure, sample construction activities did lead to a balance of rural and remote schools in the sample. Table 2.2 describes how the nature of the sample changed.

**Table 2.2:** School Sample Characteristics

Characteristic	Proposed	Actual
Demographic Setting*		
Remote (rural)	5	5
Non-remote (rural)	5	5
School Size		
Large (Over 1,000 children)	3	3
Medium (500 to 999 children)	3	5
Small (less than 500 children)	4	2
School Type		
Core School	3	2
Satellite School	3	8
Annex School	4	0
Ethnic Composition		
Ethnic Khmer	8	9
Cham (Muslim)	2	1

With the exception of teacher numbers, the selection of key informants generally conformed with the parameters originally suggested in the proposal to WFP (see Table 2.3). There were, however, some modifications in the involvement of teachers in the study. The team had originally devel-

oped a list of teachers to be randomly selected, based on personnel lists provided by schools. Unfortunately, the period during which data collection in schools took place was characterized by high absenteeism among teachers due to a number of factors. These factors included the defection of many teachers from their posts to take jobs relating to the elections as well as generally poor school management. As a result, many of the teachers randomly selected from personnel lists were often not present at the school on the day of the interview during baseline activities. As a result, research team members decided to interview all teachers present at a school on the day of the interview, thereby greatly inflating the number of teachers used in the study as key informants. During the most recent round of data collection conducted for the present report, the same specifications for key informant selection were followed in order to ensure comparability between outcomes. Although the decision to involve all the remaining teachers in a school as key informants solved the problem of high absenteeism among teachers, it also potentially introduced an element of bias into the sample as those teachers who are more diligent in their attendance are more likely to give thoughtful answers to questions. Nevertheless, it seemed difficult to get around this problem. It is hoped, however, that the large number of teachers interviewed (more than half of the total population of teachers in selected schools) will help compensate for this bias.

Overall, it appears that the number of individuals actually interviewed or who completed questionnaires (667 persons) generally approximated the number of individuals originally proposed during the research design stage (640 persons). This can be seen clearly in Table 2.3 below.

**Table 2.3:** Selection of Key Informants

Key Informant	Selection Methodology Used	Population Size	Proposed Sample Size	Actual Sample Size
School Directors	Entire Population will be interviewed	10	10	10
School Teachers	Random Sampling	146	20	74
Cooks	Random Sampling	41	10	10
Community Members	Quota Sampling	2000	300	272
Children	Quota Sampling	2000	300	298
<b>Total</b>	--	<b>4,197</b>	<b>640</b>	<b>667</b>

### 2.3 Research Instrumentation

The research team developed four separate questionnaires for school directors, teachers, students, and parents during July 2006. In the case of students, questionnaires were designed for older children in Grades 5 and 6. These draft questionnaires underwent considerable change over three rounds of revision. Based on comments from WFP reviewers, questionnaires became much more streamlined with the elimination of many questions that tended to be somewhat tangential to the research variables summarized in Table 2.1 above. In the second round of data collection, questionnaires underwent some revisions to reflect efforts to gauge change in attitudes about sprinkles. With the exception of parents, all questionnaires were self-administered. Questionnaires for parents were administered as an interview schedule. All questionnaires were finalized in early September 2007.

For each round of data collection, KAPE organized a one-day orientation for team members that reviewed the goals of the research, protocols for administering the questionnaires (both baseline and post-baseline interviews), and the intention of each question. Team leaders provided clarifications for various questions and some additional modifications of a minor nature also occurred



based on feedback from team members. In addition, the research team developed a division of labor for various tasks in the administration of questionnaires as well as a schedule for visiting individual schools.

### 3. RESEARCH RESULTS

#### 3.1 Logistical Aspects of Implementation of Micronutrient Sprinkles

An assessment of the logistical aspects of implementing MS sprinkles did not discover any major problems with respect to storage, transportation, or distribution. On average, about 1,767 MS packets were distributed to children on a weekly basis in each school (i.e., 17,670 packets in total each week). A summary of responses by key informants including school directors, teachers, and students is presented in Box 1, as it relates to these logistical issues. Whenever possible, interviewers tried to validate responding patterns by checking on things themselves, particularly with respect to storage and distribution arrangements. In this respect, all schools were found to be in compliance with storage guidelines for the sprinkles, even though most schools had reported that there had in the past been some loss or theft from storage rooms during the regular implementation of SBP. Similarly, most responses by school directors tended to be corroborated by teachers and students. For example, about 80% of directors reported distributing MS packets at every meal, which was corroborated by a responding rate of 87% among teachers and 76% among students (see Box 1). In addition, nearly all students reported that they had ever eaten MS packets at some point.

<b>Box 1: Summary of Reported Responses about Logistical Aspects of Implementation</b>		
1. Average Weekly Distribution:		1,767 packets
2. Schools storing at school:		90%
3. Schools reporting difficulties in storage:		None
4. Schools storing MS according to guidelines:		All
5. Schools with guards:		All
6. Schools that have ever experienced loss from storeroom:		86%
7. School Directors reporting they distribute packets themselves:		10%
8. Teachers reporting School Directors distribute packets themselves:		22%
9. Students reporting that they received MS directly from Director:		35%
10. School Directors reporting that they found distribution difficult:		60%
11. School Directors reporting they distribute MS at every meal:		80%
12. Teachers reporting that School Directors distribute at every meal:		87%
13. Students reporting that they have ever eaten MS:		99%
14. Students reporting that they receive MS at every meal:		76%
N=10 (Directors); N=73 (Teachers); N=298 (Students)		

A majority of school directors tended to find that the distribution of MS packets was somewhat problematic in terms of the logistical planning required. Of those interviewed, about 60% reported that the distribution process was problematic, particularly in large schools where the number of students involved would clearly suggest some difficulties in overall management. The range of problems cited by school directors included the large number of students who had to receive the packets, negative reactions from students because of the smell associated with the sprinkles, and the fact that some students are resistant to taking the packets when provided by the teacher. This resistance relates mainly to the smell of the sprinkles, which

**Table 3.1:** Problems Cited by School Directors in Distribution MS Packets (N=10)



is discussed in more detail in a later section. School director responses are summarized in Table 3.1 below. The problems cited by directors seemed to be evenly distributed across those school directors reporting some sort of problem in distribution.

Response Cited	Number	%
Distribution not reported as problematic	4	40%
Too many students to distribute to	2	20%
Some students don't like to eat it because it smells	2	20%
Some students don't like to take it when provided.	2	20%

School directors also reported a wide range of methods that they employed for the distribution of MS packets. In most cases (50%), this involved a distribution of packets to teachers based on a verbal request, which was presumably linked to the number of children

**Table 3.2:** Methods of Distribution Cited by School Directors (N=10)

Question	Responses	Number	%
How do you distribute micronutrient sprinkles to students?	I distribute them to the teacher according to their verbal request	5	50%
	I distribute to teachers according to a prescribed list	2	20%
	I distribute them to students directly by bringing them around myself.	1	10%
	Other (Cooks help to distribute)	2	20%

who were in attendance on any given day (see Table 3.2). Only one director reported taking direct charge of the distribution by providing the sprinkles to children by himself while two others went so far as to develop an exact, pre-planned list for distribution each week.

**Table 3.3:** Reported Usage of the Sprinkles by Students Reported by School Directors and Teachers (N=9)/(N=73)

Question	Responses	Number	%
If you check to see that children are actually using the sprinkles, do most of the children put it on their food?	Among School Directors		
	Yes	7	78%
	No	2	22%
	Among Teachers		
	Yes	62	84%
	No	11	16%

When asked about what happened to the sprinkles after their distribution, all school directors (100%) and most teachers (95%) reported that they did checks to see that children used them. However, of those that did these checks, there was a significant minority who reported that not all children were actually using them. In this respect, only about 78% of school directors reported that 'most' students actually use the sprinkles on their food. Among teachers, about 84% reported that most children use them on their food (see Table 3.3). Since the greater numerosness of teachers is a better indicator of usage among students, one might conclude from these reports that a large number of children in about 16% of participating classes do not really seem to be eating the sprinkles.

**Table 3.4:** Problems Relating to the Disposal of the Sachets Cited by School Directors and Teachers (N=10)/(N=73)

Question	Responses	Number	%
Does the disposal of the MS sachets create a great deal of un-kept litter at your school?	Among School Directors		
	Yes	0	0%
	No	10	100%
	Among Teachers		
	Yes	3	4%
	No	70	96%

Investigations about the disposal of the sachets with respect to the creation of litter are summarized in Table 3.4. In this regard, neither school directors nor teachers appeared to believe that

this was a serious problem. Only 4% of teachers expressed the opinion that the disposal of the sachets did create a problem on the school grounds and in classrooms.

### 3.2 The Process of Sensitization and General Awareness Raising

#### 3.2.1 Preliminary Awareness Raising Activities

As noted earlier, KAPE staff conducted awareness raising orientations at each school that included parents, students, and teachers. Topics covered in orientations included general topics of nutrition (e.g., the basic food groups), diseases that result from lack of nutrition, and how micronutrient sprinkles can help children’s bodies and minds.

Orientations themselves occurred at the end of November and early December 2006. Didactic materials used during orientations included official government posters on nutrition and hand made displays. The orientations employed many concrete activities to promote understanding such as opportunities for participants to handle and taste micronutrient sprinkles. In general, the orientations seemed to be well received and were characterized by high attendance among participants. In this respect, attendance ranged from between 60 to 100 participants or more at each school. Overall, research team members estimate that over 700 stakeholders participated in one-day orientations at schools that included school directors, teachers, parents, cooks, and children. Following orientations, research team members also ensured that educational posters were placed in prominent places both inside and outside of classrooms.

#### 3.2.1 Community and Student Awareness of the Intervention

Following the completion of sensitization exercises, about 80% of school directors reported that they called a general meeting at the school to inform the community about MS distribution at school breakfasts. This response rate is corroborated by community responding in which 91% of those interviewed indicated that they had attended meetings at the school while 87% of those interviewed stated that they had heard of micronutrient sprinkles. This compares with a baseline of only 47% who had heard

**Table 3.5:** Community Awareness and Understanding of the MS Intervention as Cited by School Directors (N=10)

Question	Responses	Number	%
In general, how well do parents understand the purpose and usefulness of micronutrient sprinkles?	Most understand very well.	3	30%
	Understanding is moderately good but not so deep.	6	60%
	Most don’t understand at all well.	1	10%

of it shortly after awareness orientations had taken place. Thus, it would appear that information about the intervention had traveled widely during the course of the intervention’s implementation. To be sure, only about 30% of school directors indicated that they believed community members had a very good understanding of the purpose and usefulness of MS while 60% believed that understanding was generally good but not yet very deep (see Table 3.5). In contrast, one school director expressed the opinion that most parents did not understand what the intervention was all about though they had certainly heard about it.

The above findings aside, most of the community members interviewed (91%) indicated that they were aware that their children were receiving MS to put on their food and 94% of these said that they were happy for their children to be doing so. Only 3% of those who had heard about the in-

**Table 3.6:** Children Indicating That Their Parents Had Instructed Them Not to Eat Sprinkles (N=287)

Question	Responses	Number	%
Have your parents ever told you NOT to use the sprinkles on your food?	Yes	55	19%
	No	232	81%

**Box 2: Summary of Important Observations About Awareness among Students & Parents**

1. Community members aware of the intervention: 91%
2. Community members approving of MS sprinkles: 94%
3. Community members approving at baseline: 66%
4. Students communicating the intervention to parents: 81%
5. Parents instructing their children not to eat MS: 19%
6. Students following parental advice: 8%
7. Students aware that MS is rich in vitamins: 92%

N=272 (Community); N=298 (Students)

intervention indicated that they had concerns about its distribution and 1% ventured no opinion. The willingness expressed by the vast majority of parents for their children to eat micronutrient sprinkles contrasts with information from the baseline in which only about 66% indicated a willingness for their children to participate in the intervention.

Among the students interviewed, awareness of the MS intervention appeared to be nearly universal with almost all those asked reporting that they knew about the sprinkles. Even at the time of the baseline survey when orientations were occurring, 95% of children indicated that they had heard of MS. Most also indicated that they knew about its health enhancing powers and a large number (82%) indicated that they had explained its purpose and importance to their parents. In this respect, student informants were asked whether their parents had a negative opinion of the powder and in particular whether they had been instructed not to eat it. About 19% of the student sample reported that they had been told by their parents that it was probably *not* a good idea to eat it, but only 42% of these students (or about 8% of the entire sample) reported that they had actually followed their parent’s advice (see

Table 3.6). The remaining 58% indicated that they had asked their teachers for clarification or had told their parents that the powder was actually good for their health and not harmful. The significant minority of parents cited above who told their children not to eat the sprinkles likely reflects the residual number of parents (34%) who did not want their children to participate in the intervention at the time of the baseline (see above). When children indicated that their parents had given them instructions not to eat the sprinkles, it is likely that this reflected an opinion of the program earlier in the year when nearly a third of parents had not fully accepted it, as indicated by the baseline data. But as noted earlier, 94% of the parents interviewed later in the year as part of post-testing activities expressed high approval of the MS distribution.

When asked about how micronutrient sprinkles were helpful to one’s health, most students were able to give lucid answers focusing on the nutrient value of the sprinkles. For example, about 92% of those interviewed mentioned that MS is rich in vitamins, 5% mentioned iron, and 2% mentioned iodine. Only 1% of those asked could not venture an answer, suggesting a relatively high awareness among students of its usefulness (see Box 3). Of course, it is important to remember that most of the students interviewed for purposes of this study were in Grade 4 or higher.

**Box 3: Student Responses Relating to the Usefulness of MS**

*Students indicating that micronutrient sprinkles provide:*

- Vitamins: 92%
- Iron: 5%
- Iodine: 2%
- No Response: 1%

N=298

The major change in parental opinion of the intervention by the time the school year was drawing to a close is a strong indicator of the intervention’s success, at least in terms of its acceptance by the community. What is not completely clear is why this change occurred among the 34% of parental doubters identified at the time of the baseline. There are a number of possibilities to consider in this regard that may account for the change. For example, the orientations provided by project staff for students and parents likely had some effect as well as community meetings called by the school director. But the fact that 82% of students reported they had explained the intervention to their parents (in positive terms) probably impacted parents’ opinions of the intervention greatly. This suggests an important strategy in future efforts to ensure acceptance of the intervention among community members should it be expanded.

### 3.3 Overall Perceptions of the Effectiveness of Sprinkles among Stakeholders

#### 3.3.1 Perceptions among School Staff

All of the school directors participating in the intervention expressed satisfaction that their school had been chosen to pilot micronutrient sprinkle distribution as part of SBP programming; additionally, 50% expressed ‘great’ satisfaction about having been chosen. But in spite of their own happiness with the intervention, some expressed concern that not all students were eating the sprinkles. These concerns centered mainly on the color, smell, and taste of the sprinkles. Coloring was the least problematic concern in this respect with 90% of school directors indicating that it was not a problem for children. On the other hand, however, only 70% of the school directors interviewed indicated acceptability in terms of taste and smell (see Box 4). Although the sprinkles are supposed to be tasteless and odorless, 30% of directors reported that a significant minority of students complained that the sprinkles made their food smell and taste sour. Although a large number of students (78%) did indeed report that the sprinkles made their food taste somewhat sour, 97% still reported that they ate it regardless (see below).

**Box 4: Summary of Responding Patterns about MS Perceptions among Directors**

*School directors’ opinions indicating that micronutrient sprinkles are acceptable to children with regards to:*

- Taste: 70%
- Color: 90%
- Smell: 70%

N=10

Interviews with teachers generally yielded very positive findings in terms of changes in student behavior. In this respect, 93% of the teachers interviewed reported seeing some change in children’s behavior. The change most commonly cited by teachers appears to be a lower incidence of sickness with 81% of teachers reporting such a change. Other changes included improved learning capacity (68%), better attendance (64%), and less inattentiveness (55%) (see Table 3.7). As noted earlier, about 84% of teachers reported that a majority of the children in their classrooms actually use the powder on their food, but that in 16% of cases many do not (see Table 3.3). Because a

**Table 3.7:** Changes Noted by Teachers after Providing MS Sprinkles to Students (N=73)

Question	Responses	Number	%
Since your school started using the sprinkles, what changes, if any, do you see in the behavior of children in comparison to previous years?	No Change	5	7%
	Less sickness than before	59	81%
	Improved learning capacity	50	68%
	Better attendance than before	47	64%
	Less inattentiveness than before	40	55%

large majority of the older students (97%) interviewed for this study indicated that they put the MS powder on their food, it is suspected that non-usage reported by teachers in these 16% of cases is mainly a problem among very young children.

### 3.3.2 Perceptions among Students

The perception of micronutrient sprinkles among the vast majority of students interviewed appears to be positive. In this respect, about 90% of students indicated that they were either ‘satisfied’ or ‘very satisfied’ with eating the sprinkles (see Table 3.8). Only 10.5% were not so happy to be using MS powder on their food. It must be remembered once again, however, that these satisfaction levels may only represent the feelings of older students and that younger students may be more prone to disliking the sprinkles, as suggested earlier. Nevertheless, the level of satisfaction with the sprinkles expressed by the older students interviewed appears to be very high. This fact notwithstanding, it should also be noted that although the majority of student informants reported eating the sprinkles, 78% indicated that the powder affected the taste of the food by making it slightly sour.

Among those students who indicated that they sometimes do not like to eat the sprinkles, most said that they give them back to the teacher or cook. Only 5% (or 2% of the entire sample) indicated that they throw the packets away, suggesting that the incidence of waste during the course of distribution is quite low (see Table 3.9). Some parents (26%) also reported that their children sometimes bring the packets home with them to use at family meals.

It was reported earlier that most students are aware of the high nutrient content of the sprinkles, especially with regards to its vitamin content. Following upon this finding, about three-quarters of the students interviewed also indicated that they had noticed some improvement in their health since they started eating the sprinkles. The other quarter indicated that they saw no change or were not sure

**Table 3.8:** Satisfaction Levels with Micronutrient Sprinkles Reported by Students (N=292)

Question	Responses	Number	%
Are you satisfied to eat the sprinkles provided to you each day?	Very satisfied	209	72%
	Satisfied	52	18%
	Not so satisfied	29	10%
	Not satisfied at all	2	0.5%

Note: Rounding error=0.5%

**Table 3.9:** Incidences of Waste Reported by Students Not Wishing to Eat the Sprinkles (N=125)

Question	Responses	Number	%
[On occasions when you don't want to eat it], what do you do with the sprinkles?	Give it back to the teacher or cook	116	93%
	Throw it away.	6	5%
	Other	3	2%

**Table 3.10:** Students Reporting Change in Their Health as a Result of Eating MS (N=295)

Question	Responses	Number	%
When you eat the sprinkles, do you feel that there has been any change in your health or not?	Yes	224	76%
	No	34	12%
	Not sure	37	13%

Note: Rounding error=1%

#### **Box 5: Summary of Student Perceptions of Micronutrient Sprinkles**

1. Students satisfied with eating MS: 89%
2. Students reporting that MS has helped their health: 76%
3. Students reporting that the MS affects food taste: 78%
4. Students indicating they would like MS next year: 92%
5. Parents reporting that children bring packets home: 26%

N=298 (Students); N=272 (Community)



(see Table 3.10). Nevertheless, when asked whether they would like to see MS distribution continued next year, 92% of the student sample indicated that they would like it to continue.

### 3.3.3 Perceptions among Community Members

As noted earlier, data collection among community members yielded an approval rating of about 94% of the parents interviewed. This satisfaction level appears to have influenced willingness to send children to school with a very high proportion (95%) saying that the intervention had made them more willing to send their children to school (see Table 3.11).

**Table 3.11:** Parents Reporting that MS Distribution Has Affected Their Willingness to Send Children to School (N=272)

Question	Responses	Number	%
Has the distribution of MS at school affected your willingness to let your child go to school?	Yes	259	95%
	No	3	1%
	No opinion	10	4%

Post-test questions relating to the number of parents who provide breakfast to their children before going to school indicated that 9% of those interviewed do make breakfast for their children before school. This compares with a baseline value of 3% of parents who indicated that they provided breakfast. It is not clear whether this small difference between baseline and post-test values is simply spurious or whether there was some slight effect of MS distribution to make the 6% of parents who continued to express some disapproval of the intervention more prone to make breakfast for their children. In any case, the discrepancy appears to be small.

**Table 3.12:** Parents Reporting Change in Child’s Health since MS Distribution Started (N=256)

Question	Responses	Number	%
Have you noticed any improvement in your child’s health since the school started the distribution of micronutrient sprinkles?	Yes	221	86%
	No	7	3%
	Don’t know	28	11%

Parental responding patterns were also highly positive in terms of the effect of sprinkles on their children’s health. In this respect, 86% of parents reported that they had noticed some positive effect of the sprinkles on the health of their children against 14% who did not see any difference or were not sure if there had been any change (see Table 3.12). As in the case of teachers’ and students’ responses, these observations are purely subjective but similar responding patterns among all key respondents against this question tend to corroborate the observations made.

## 4. DISCUSSION AND CONCLUSIONS

### 4.1 General Observations

In general, the implementation of Micronutrient Sprinkles distribution as part of SBP programming appears to have been successful in terms of its overall acceptance by stakeholders both at school, in the community, and among children. In this respect, it was found that approval ratings among all key stakeholders were in the 90% range. Perceptions also seemed to be highly positive in terms of the effect of the sprinkles on children's behavior with significant proportions (60% or more) reporting better attendance, health, and improved learning. These are highly subjective observations, however, that could not be cross-validated by more empirical investigations within the scope of current research. Nevertheless, the significance of these findings for purposes of the present study is that these positive perceptions, the question of whether they are right or wrong aside, likely had some effect on the overall acceptance of the intervention among stakeholders.

Changes in the perceptions among community members demonstrated the most radical change from baseline values with acceptance of the intervention moving from 66% at the start of the study to 94% by the time it ended. Based on interviews with students, researchers believed that changes in community attitudes were fostered mainly by explanations from children in their homes. These *de facto* information dissemination activities had high credibility and great reach, given that 81% of children reported telling their parents about the intervention; another significant proportion reported that they actually tried to convince their parents of its usefulness when they received parental advice not to eat it. Thus, reaching parents through children appears to be a possible communication strategy of great importance for future programming.

In spite of the overall positive reception of the intervention among all stakeholder groups, there were still some 'soft' areas of vulnerability in stakeholder perceptions noted by researchers as well. Among children, for example, most reported that they ate the sprinkles when provided and were happy to do so but that the powder had some effect on taste. About 78% of student interviewees stated that the sprinkles made food taste a little bit sour. Since those student stakeholders interviewed as part of this study were mainly from the higher grade levels, it is possible that this reported effect on taste may make younger children less prone to eat it. That is, there is a common perception that younger children are more finicky in their eating habits than older children. This supposition, as yet unproved, is supported by the observation that 90% of interviewed (older) students expressed overall satisfaction with the intervention but that only 81% of teachers reported that most of the children in their classes actually ate the powder. This difference in reporting is suspected to stem from the variable behavior among younger children who were not interviewed as part of the data collection process. This is a reasonable supposition but one that needs further investigation.

There were also similar concerns about 'softness' in acceptance of the intervention among community members, as well. In this respect, these possible points of vulnerability in community perceptions are suggested by closer reading of the available data in spite of the observation that approval ratings overall among parents exceeded 90% by the end of the study. For example, 60% of school directors reported that although most parents seemed to understand the intervention at some level, this understanding was not very deep. In addition, it was also a surprising finding that 19% of students reported that their parents had explicitly given them instructions not to eat the sprinkles at various points during implementation. In addition, there was still a hard-core grouping of 6% of parents who maintained some opposition to the intervention in spite of school meetings, orientations, explanations from children at home, and perceived positive effects on health and nutrition. These observations suggest the need for a watchful attitude during implementation



each year.

Among school staff, the potential for negative perceptions of the intervention was greatest in regards to the logistics of implementation. In this respect, about 60% of school directors mentioned that they found implementation of the intervention to be problematic because of the need for significant organizational planning from storage, to distribution and disposal. This was especially true at the big schools. Thus, implementation of MS sprinkles may encounter significant problems if it occurs at poorly managed schools of which there are many in Cambodia.

## **4.2 Recommendations**

Based on the above observations, the following recommendations are provided to World Food Program in its consideration of scaling up the intervention:

1. Selection of Schools: WFP should be highly selective when determining those schools to participate in any scaling up of the activity. Since the intervention requires significant management capacity, poorly managed schools should not be allowed to participate in the activity. This suggests the need for pre-assessments that focus on management capacity as a prelude to implementation.
2. Maintain Focus on Orientations with an Important Role for Children: Orientations seemed to play an important role in winning over parents to support the intervention. These orientations should continue but with a strong focus on using children as an important vector for the dissemination of information. This might include giving students simple literature and samples of the packets to bring home with them to explain to their parents as part of the general orientation process.
3. More Formalized Orientation Materials: Many of the materials developed for orientations for stakeholders as part of the present pilot had to be quickly translated into Khmer using disparate documentation that was collected on an ad hoc basis. It might be advised to have a more formalized set of documentation developed explicitly for MS implementation.
4. Clear Guidelines for Implementation: When implementing MS distribution, school directors were mostly left to their own devices for managing and organizing distribution of packets. It is advised that more explicit guidelines for organization of the intervention be developed in order to assist directors, cooks, and teachers in planning and management. These guidelines need not be long but should deal with such issues as the need for prescribed lists for distribution by class, how to minimize waste (e.g., if some students in a class do not want to put the powder on their food during a morning distribution), and how to conduct orientations. Although much of the management requirements are really common sense, programming should avoid making major assumptions about local management capacity in order to anticipate possible problems.
5. Close Monitoring of Young Children: It was suggested that a large minority of young children may not like putting MS powder on their food due to the slightly sour taste that it causes. These suppositions should be investigated further to determine whether and to what degree they might be true followed by possible further adjustments in implementation.