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School Nutrition Programme of BRAC and Banchte Shekha: A Baseline Report

Rifat Afroze
Md. Moslem Uddin Mia
Md. Saiful Islam Majumder

BRAC Centre, 75 Mohakhali, Dhaka 1212, Bangladesh
Tel: 9881265, 8824180-7 (PABX), Fax: 88-02-8823542
Email: research@brac.net, Web: www.brac.net/research

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Rifat Afroze
Md. Moslem Uddin Mia
Md. Saiful Islam Majumder

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Research and Evaluation Division
BRAC Centre, 75 Mohakhali, Dhaka 1212, Bangladesh
E-mail: research@brac.net, www.brac.net/research
Telephone: 9881265, 8824180-87

For more details about the report please contact: rifat.a@brac.net

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ABSTRACT

This is a baseline study of a School Nutrition Programme (SNP) funded by Dubai Care and GAIN and implemented by two NGOs – BRAC and Banchte Shekha. The study aims to portray the elementary situation in terms of basic education and nutritional features which might create some impact as a result of this initiative. BRAC is implementing the programme in a rural and an urban areas and Banchte Shekha in a rural area. It is a one year programme – started on May/June 2012 and is expected to end on August 2013. BRAC serves 3,614 students of 23 schools in rural area and 8,444 students of 57 schools in urban area, and Banchte Shekha serves 6,208 students of 22 schools.

Besides cross-sectional surveys of the students and their households and schools, it also included observation of the implementation process. The study sample was independently selected from three project sites comprised into two groups: an intervention group and a control group from each area. A proportionate sampling technique was followed to choose the respondents. Study sample includes 4,602 students from 60 schools.

The findings reveal that learners of urban intervention site were relatively better in terms of their parental education and socio-economic condition of households. Nutritional and educational situation of these students were relatively better compared to the other two groups. To some extent significant difference was found between intervention and control groups in terms of learner's performance, food security and nutritional knowledge and practices. It would require careful selection of data analysis techniques after the end-line surveys. Propensity score matching technique may be an option.

It was noticed from class observation that the entire food distribution took more than 30 minutes to complete. Majority of the students were found satisfied with the initiative and their parents as well. However, monotonous food menu created dissatisfaction to a few. A diversified menu might increase their satisfaction. Adaptation of a continuous monitoring system might be helpful for both the implementing organizations to improve health and hygiene practices at student, school and household levels.

CHAPTER 1

INTRODUCTION

Malnutrition affects billions of people worldwide (FAO 2010). According to the Global Alliance for Improved Nutrition (GAIN) malnutrition encompasses both under-nutrition (i.e. lack of protein, energy and micronutrients) and over-nutrition (i.e. excess of energy, fats and micronutrients) (WHO 1995). The World Health Organization (WHO) on the other hand has defined malnutrition as the cellular imbalance between supply of nutrients and energy and body's demand for them to ensure growth, maintenance, and specific functions. Hence, malnutrition is synonymous with under-nutrition and refers to all deviations from adequate and optimal nutritional status in infants, children and in adults (WHO 1995).

Malnutrition is endemic in developing countries, and poses a serious threat to the population's health and well-being as well as to the productivity and economic growth of a country in the long term. For instance, UNICEF (2010) estimated nearly half of the 11 million deaths among under-five children in developing countries were due to malnutrition. In 2011, two billion people in the world were affected by malnutrition (FAO, 2010). Moreover, an estimated 2.6 million children die each year due to malnutrition, which amounts to one-third of child deaths worldwide (Black *et al*., 2008).

In recent years, researchers have been able not only to disseminate the specific effects of malnutrition in children and adults, but also to identify which particular micronutrients are responsible for health (physical or mental) and other individual defects. For instance, it has been found that iron deficiency accounts for 50% of anaemia cases globally. Crucially, according to WHO (2009) nearly half of the children in developing countries are affected by anaemia, something that hinders their physical and mental development. Further, lack of vitamin A commonly found in such foods as animal liver, fruits and vegetables and its deficiency causes early childhood blindness and lack of zinc hinders physical growth (Black *et al.* 2008). Equally intriguing are the findings that malnourished children earn 20% less than adequately nourished ones when they become adults (Grantham-McGregor *et al.* 2007) and that countries can lose up to 3% of their annual Gross Domestic Product due to their populations' lack of iron, iodine, and zinc in their diets (Horton *et al.* 2008). Finally, malnutrition can lead to reduced school performance. This may result from direct undernourishment of the brain, and it may result from the micronutrient deficiencies mentioned above. The effects are potentially permanent. Therefore, malnutrition has a significant impact on socio-economic development as well as on both physical and mental growth.

GLOBAL CONTEXT: HISTORY OF SCHOOL NUTRITION PROGRAMMES

In developing countries, numerous feeding programmes have been implemented to help children's benefit from education. School feeding schemes were introduced as early as in the 1940s in South Africa, whereas large scale school feeding programmes were implemented in China in the 1970s and 1980s. Various organizations during the past two decades worked in collaboration with the UN to achieve the Millennium Development Goals (MDG) that relate to health, hunger, and poverty. By early 2012, GAIN had reached 89.5 million people in Bangladesh, India and Indonesia through its food provision schemes, including 3.26 million mothers and children in India[1].

[1] http://www.gainhealth.org/

Evaluation of school nutrition programmes is generally based on the malnutrition classification set by WHO. It looks at indicators like height, weight and age for classifying the degree of malnutrition to mild, moderate and severe. That is, the child's height, weight are compared to those of an adequately nourished child of the same age. Chronic malnutrition results to underweighting and stunting. Exploring these indicators in-depth, epidemiological studies have found strong association between low weight-for-age and child mortality. In fact, use of weight-for-age measure has shown that 56% of child deaths in 53 developing countries were due to malnutrition and 83% of those deaths are attributable to mild-to-moderate malnutrition (Pelletier *et al*. 1995).

On the other hand, numerous studies have focused on the role of nutrition interventions in school attendance, achievement and nutritional status. Overall, school feeding schemes appeared to improve nutritional status, school attendance and achievement. Inconsistencies in the findings have been frequent, although they can be commonly explained by differences in the initial nutritional and socio-economic status of the samples (e.g. children severely undernourished are more likely to benefit). Early studies such as Hertzig *et al*. (1972) examined the intellectual functioning at school-age in boys who had been severely malnourished during the first two years of life and found that their IQ levels were lower than those of similar age. Powell *et al.* (1998) studied the effects of breakfast in school children in rural Jamaica, and found that height, weight and attendance improved compared to a control group; the younger ones even improved in arithmetic progression. On the other hand, a study on Sri Lankan school children comprising among others weight for height data showed a weak relationship between current nutrition and academic performance (Aturupane *et al*. 2007). A New Zealand study employing a randomized trial design showed that breakfast provision (milk, biscuits and cereal) improved attendance, school grades and psychosocial function of school children aged 5-13 years (Murchu *et al*. 2010). Similarly, a randomized control intervention in Kenya showed that school feeding resulted in improved school attendance among elementary school children (Omwami *et al*. 2011).

NATIONAL CONTEXT: NUTRITION PROGRAMMES IN BANGLADESH

Bangladesh has made a notable progress towards achieving the Millennium Development Goals. With financial support of the World Bank Bangladesh implemented an integrated nutrition project (called BINP) during 1995 – 2000, aiming to:

1. Improve the capacity of national level institutions in advocacy, policy planning, and programme support,
2. Improve the capacity of communities, households, and individuals to understand their nutritional problems and to take appropriate action, and
3. Improve the nutritional status with particular emphasis on children and pregnant and lactating women.

The idea behind the project was that poor nutrition was a result of ignorance rather than poverty (World Bank 2005). Thus, it was expected that the impact would be achieved through counselling. This rationale was boosted by findings that malnourished children existed even in the wealthier areas. Hence, the project consisted of nutritional counselling and supplementary feeding to children and pregnant mothers. The project was eventually succeeded by the National Nutrition Project (NNP). Although the World Bank evaluation showed significant decrease of

malnutrition in the programme areas, counter-factual analysis carried out by Save the Children UK and the Helen Keller International showed no significant impact in nutritional status between programme and non-programme areas; although most malnourished children had obviously benefited from the intervention.

Food provision in schools started in 2002, when WFP collaborated with the government to launch the school feeding programme in the less food-secure areas of Bangladesh. The programme aimed to deal with short-term hunger to improve performance in classroom, and reached 1.2 million pupils in 33 *upazilas* by distributing fortified biscuits. Similarly, the EU funded distribution of tetra-pack milk and fortified biscuits in 10 *upazilas*. So far, they have covered 100,000 primary school students in those *upazilas*. Later, a pilot project was initiated by Land O' Lakes Foundation with support from US Department of Agriculture (USDA). Numerous studies have showed that school feeding can increase enrolment and decrease dropout. According to DPE, net enrolment rate has raised from 74% in 1992 to 98% in 2008, whereas, dropout rate slightly fell from 35 to 33% in the same period (UNICEF 2005).

CHAPTER 2

PROGRAMME DESCRIPTION

Dubai Cares and GAIN jointly inaugurated a new pilot School Nutrition Programme (SNP) sanctioned by the government of Bangladesh in May/June 2012. The programme provides hot cooked meal to primary school children aged 5 to 11 years. BRAC and Banchte Shekha are two implementing agencies. Both government and BRAC primary schools were included as intervention sites. Schools were chosen from Dhaka (urban) and two rural areas of Mymensingh district. BRAC works in the urban and one of the rural sites and Banchte Shekha in a rural area. Nutritious foods are prepared in eight centralized cluster kitchens which are operated and managed by the implementing organizations. By integrating cross-cutting interventions such as nutrition, sanitation and good hygiene practices as well as focusing on important themes that promote sustainability for example of community empowerment, gender and governance, the programme is expected to deliver positive impact.

FOODS AND THEIR NUTRIENT VALUE

Recommended daily allowance of calorie for children aged 5-11 years range from 1,715–2,220 kcal for boys and 1545–1845 kcal for girls. However, energy provision for each pupil is about 545 Kcal/day from cooked food and about 300 Kcal/day from processed food; no difference by gender. This amount of calorie is considered sufficient for alleviating or minimizing pupils' daily Kcal allowance gap. This means that the initiative can only supplement rather than fully cover pupils' nutritional needs.

Although it was planned to provide cooked meal in a third of the 240 school working days in a year and branded processed food in rest of the days, but processed food distribution has not yet started due to some technical constraints. Hence, for the time being the programme is providing only cooked food of different forms in alternative days (Table 1).

Both the organizations provide *khichuri* as hot cooked meal which is made of rice and lentils (mung bean), vegetables and oil. Both has a second option too which varies slightly. BRAC's second option includes fried rice with nut, eggs and carrots and Banchte Shekha's second option includes plain rice, lentils and vegetable curry. Locally produced raw food materials are supposed to use cooked meal. Training of cooks and supervisor mothers in hygiene, monitoring of food quality and sanitation were provided by the implementing organizations.

Table 1. Menu provided by school feeding programme

Implementing organizations	Menu	Area
BRAC	*khichuri* (rice with lentil/mung bean, vegetables and fortified oil)	Rural and urban
	Egg Fried Rice	Rural
	Processed Food (will be started in future)	Urban
Banchte Shekha	*Khichuri*	Rural
	Rice with Vegetables and Pulse Curry	

Whatever may be the menu, the main target is to provide required amount of energy and micronutrients through diversification of food menu and food ingredients with a limited budget. Generally hot cooked meal are prepared with rice, lentil/mung bean, egg/meat (occasionally), locally produced vegetables, fortified edible oil and spices including fortified salt. In general, food costs from Tk 10.00 to 11.00 per day per student with an average of Tk 10.50. In egg fried rice, proportions of pulse and vegetables are reduced without affecting total energy (kcal) values, so that total per unit cost of cooked food remains same**.** Ingredients of cooked food particularly the beans and vegetables depend on their local availability, nutritional value (particularly micronutrient content), local preference and cost. Table 2 describes food ingredients, calories and protein content which estimated and proposed by the implementing organizations.

Table 2. Details of food ingredients, calorie and protein contents

Ingredients of Cooked Meal	Estimated Calorie*	Estimated Protein (gm)*
Rice (90 gm on average)	320	5.76
Lentil/mung bean/soybean (5 gm, roasted by infrared roaster)/egg 0.5/meat** (total 20 gm)	72	5.00
Mixed Vegetables (50 gm)	17	0.70
Fortified Edible oil (15 gm)	135	0
Spices(including fortified salt: 3 gm)	0	0
Total (178 gm)	545	11.46

**Ref: Nutrient Composition of Bangladesh Foods, INFS/HKI/WFP, Dhaka 1998

COMPOSITION AND FEATURES OF THE PROGRAMME

Based on their experience and expertise, BRAC and Banchte Shekha were assigned to implement the programme. Both the organizations preferred to apply the strategies which they already tested in their various activities. For instance, Banchte Shekha preferred to use their mother's clubs. On the other hand, BRAC's education programme already has huge experience in engaging parents, teachers and communities in the projects. BRAC wanted to use those. However, setting up cluster kitchens and maintenance of food quality became challenges for both.

PROGRAMME INITIATION

Conditioned by the government and GAIN, Banchte Shekha gave importance on the WFP index for vulnerability assessment and mapping (VAM) for area selection. The government already took some initiatives with WFP in more than 80 topmost vulnerable areas. The reason for choosing Trishal was its moderately high status in terms of WFP vulnerable rate and no organization had food or nutrition-based activities there. The government and donor asked Banchte Shekha to take twenty-two schools under Harirampur and Amirabari unions of Trishal *upazila*. Thus, it had no choice in this.

BRAC intended to run the programme in both rural and urban settings. At first, it was decided to work in Kamrangirchar in Dhaka and Mollikbari in Bhaluka union. The first one was already a working area of WFP and many NGOs were already working in the second area. Later, Gulshan slum in Dhaka city and Hobirbari union in Bhaluka *upazila* were selected. With the consent of the government, five out of eight government primary schools (GPS) were selected for the programme. Fifty-two BRAC primary and pre-primary (PP) schools were also considered for intervention. For

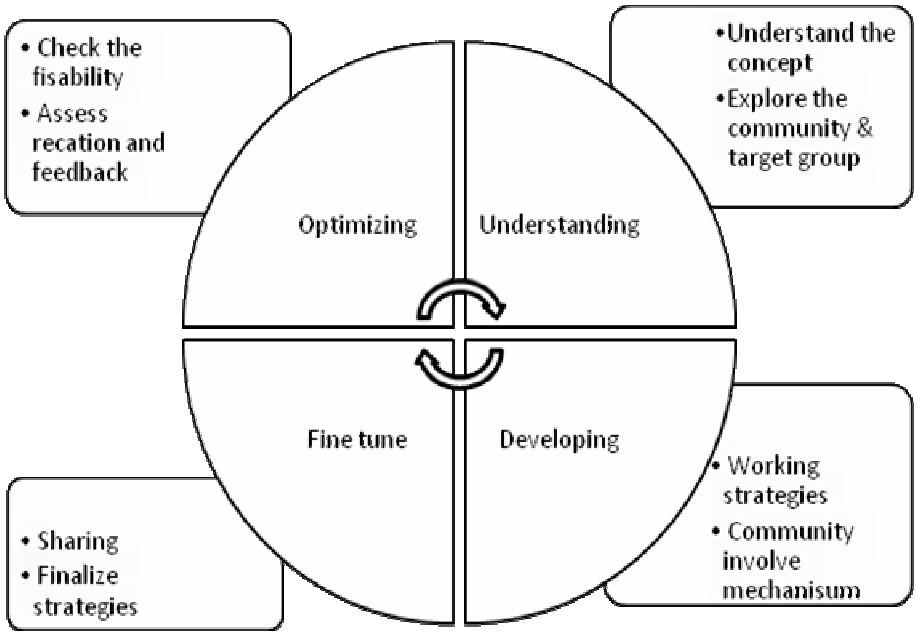
Hobirbari, eight GPS were selected which were easy to communicate and relatively closure to BRAC local office. Consent of *upazila* education officer (UEO) was taken in both the areas. Total number of schools was 80.

DEFINE STRATEGIES AND CHECK ITS FEASIBILITY

It was crucial to set up working strategies before starting the programme. In BRAC, the head office staff visited different countries where the school feeding programme was already running successfully. Their visit included understanding the entire mechanism through observing food preparation and distribution process, and talking to various stakeholders. They also observed that the existing country-based programmes which implementing by other organizations. In addition, BRAC field staff talked to local residents, leaders, teachers, school managing committee (SMC) members and parents to understand and find the ways of engaging them in the process. On the other hand, Banchte Shekha also observed the activities of WFP and other organizations and conducted meeting with various stakeholders which included school teachers, union council chairmen, SMC members, donor representatives and BRAC officials. Figure 1 shows the conceptual framework.

After gathering some experiences the programme officials were able to set working strategies. Both the parties recruited field staff, trained them, and made them responsible for setting cluster kitchens and project office. The key concerns were preparing the menu, maintaining food quality and timely delivery of food. Community involvement was emphasised; keen to which was formation of 'Mothers' Clubs'. Both the organizations had vast experience in dealing with mothers. They used their experience in creating clubs and other's committee with SMC members, teachers and community people. The members of mothers' clubs served food in the classrooms and other committee members regularly checked food quality. Both the organizations had five to six months for preparation and improvement of staff capacity.

Figure 1. Frame work of defining strategies and check its feasibility



To modify the programme strategies, sharing sessions with different stakeholders were conducted. This discussion helped rethink the purpose and boundaries of this programme, find effective solutions, improve communication and coordination of all stakeholders. After fine tuning the strategies, the programme staff organized inaugural ceremony with distinguished guests and community people.

After inauguration, BRAC started activities in one school in Hobirbari in June 2012 and Banchte Shekha started in Trishal in May 2012. At early stage, the programme staff faced some challenges in timely food delivery especially in urban area, maintaining discipline in class during food distribution, and finishing entire food distribution process within a fixed time (i.e. 30 minutes). Furthermore, it seemed challenging for buying raw foods and cooking huge food regularly. The programme staff also received feedback from community as well. Both the organizations conducted sharing sessions with community people, teachers and government officers. Feedbacks were considered in order to fine tuning of activities. Some other activities which both the organizations did were:

- Awareness raising which includes deworming and WASH activities,
- Programme activities sharing meeting with government and non-government officials,
- Press and media coverage, and
- Attending visitors, sharing experience, and incorporate their feedback.

CHAPTER 3

STUDY OBJECTIVES AND METHODS

This study aims to create a baseline of the SNP providing various types of existing nutritional and education status of students in project areas. To achieve this objective we tried to -

1. Measure school participation, learning achievement, nutritional knowledge, health and hygiene practices and health status of students
2. Observe school discipline during food distribution and management
3. Observe management procedure from food preparation to distribution
4. Identify stakeholders' view on programme activities

THE STUDY SAMPLE

BRAC has been providing food to 3,614 students of 23 rural schools and 8,624 students of 57 urban schools. On the other hand, Banchte Shekha has been providing food to 6,208 students of 22 rural schools. Thus 18,266 students of 102 schools are expected to be benefited from this pilot project. Table 3 demonstrates the study population at a glance.

Table 3. The study population by organization and intervention type

School Type	BRAC rural		BRAC urban		Banchte Shekha	
	Total schools	Total students	Total schools	Total students	Total schools	Total students
Government Primary	4	2,076	5	7,111	16	4,599
Registered Primary	4	1,080	-	-	6	1,609
BRAC Primary	8	257	46	1,333	-	-
BRAC Pre-primary	7	201	6	180	-	-
Total	23	3614	57	8624	22	6208

Sampling was done in such a way that three valid estimates can be generated; these include BRAC rural, BRAC urban and Banchte Shekha rural. A comparison group (having no nutritional intervention), adjacent to intervention schools, was also considered for each. Provision of comparison between formal (government and registered) and non-formal (BRAC primary) schools was also inbuilt. Thus, the major comparisons of various estimates are:

1. Intervention vs. control area
2. BRAC vs. Banchte Shekha
3. BRAC rural vs. BRAC urban

It was tried to maintain a similar level among the intervention and control schools in terms of socio-economic background and parental literacy of the students and number of students and teachers in the schools.

Ten intervention schools were randomly selected from each working area. Similar number of schools was also selected as control schools following the criteria mentioned above. Thus, total number of schools under study was 60. From each working site, 600 students were chosen randomly from intervention schools and 600 from control schools. Household information, livelihood profile, food security, health and consumption, income and education pattern, anthropometric measures were collected from them. Furthermore, a sample of 1,200 students of grade III randomly selected for testing their arithmetic skills. They were equally distributed by intervention and control schools and study site. Household-related information of these students was also collected. Finally, we conducted survey in every school to collect information on enrolment, attendance, dropout, repetition and examination pass rates. Table 4 shows the sample at a glance.

Table 4. Sample at a glance by intervention site and type

Methods	Study sites					
	BRAC rural (Hobirbari)		BRAC urban (Gulshan and Badda)		Banchte Shekha (Trishal)	
	Intervention	Control	Intervention	Control	Intervention	Control
Schools survey	10	10	10	10	10	10
Household survey	765	765	784	773	760	755
Arithmetic test	199	201	201	200	204	196

Qualitative approaches were also applied. Methods included in-depth interview, focus group discussion (FGD) and observation (Table 5). This design integrated a wide array of stakeholders in the evaluation process that included students, their household members, teachers, and officials of the programme, the government and other organizations. FGDs with parents and community were conducted to know their perception on programme activities. In-depth interview with programme staff was used for understanding their activities, supervision, community engagement, and policy planning. In-depth interview with teachers gave detailed information about food distribution and management at school level. Classroom observation was done to know the inside story about classroom participation, liveliness and retention of students. Kitchen observation was done to know food storage process, entire food preparation, eating behaviour, and hygienic practices.

Table 5. Sample for qualitative investigation by intervention site

Methods		BRAC rural	BRAC urban	Banchte Shekha
FGD	Parents	2	2	2
	Community people	2	2	2
In-depth Interview	Teacher	3	3	3
	Field project staff	3	3	3
	Head office based project staff	2		1
Classroom Observation*		2	2	2
Kitchen Observation*		2	2	2

*Three consecutive days in each

EDUCATIONAL AND NUTRITIONAL MEASURES

An arithmetic test was constructed following the competencies suitable for grade III. A standard assessment procedure was followed in this. The textbook and test questionnaires (which were used in primary schools) were reviewed to make instructions understandable for students. There were two different types of questions: multiple choice questions (MCQ) and open-ended. MCQ was adopted to evaluate the

children's cognitive ability and open-ended questions were used to gauge learners' thinking ability and conceptual understanding. Drawings were also used considering children's illustration reading ability at grade III. We were concerned about the clarity of instructions. The relevance of these illustrations was checked by experts. The researchers obtained feedback from both teachers and students from the pilot study.

Nutritional measurements like weight, height, weight-for-age, height-for-age, and weight-for-height were taken from the selected students to determine their nutritional status. Finally, for the food security index a set of nine questions was used. Table 6 presents the list of indicators by data collection techniques.

Table 6. The list of indicators against data collection methods

Data collection methods	Educational measures	Nutritional measures	Others measures
Survey	Enrolment, attendance, dropout, completion and pass number of students	Anthropometry, food security, and nutritional knowledge and practices	Socio-economic information
Observation	Attention, concentration, alertness, participation, retention, liveliness and in-class behaviour	Management procedure from food preparation to distribution, health and hygiene practices	Student and teacher's activities in food serving time
Interview/FGD	Teacher's perception	Quality control of food, storage system and waste management	Community involvement and their reactions

TEST ADMINISTERING PROCEDURE

The usefulness of a given test depends, to a great extent, on how the test was taken. In the training session, the test administration procedure was described in detail to the research assistants. Attempt was made to make the instructions understandable to them. Blackboard and instruction board were used to do so. The research assistants tried to make the procedure clear to the students and the test was started when all the students clearly understood the procedure. Twenty teams (2 persons in each) conducted the test in respective classrooms. Duration of the test was one hour.

WAY OF ASSESSMENT

Twelve competencies were addressed in arithmetic test; 3–7 questions were placed for each. Students who answered at least half of the questions correctly were considered to have attained the knowledge and skills in that particular competency.

DATA QUALITY CONTROL

The quality control was done in three phases; before, during and after the data collection. The research assistants got five days of rigorous training (including one day field test) from the core research team. Forty-five research assistants were engaged for data collection; five of them acted as supervisors to monitor and oversee the whole procedure. The core team supervised the entire filed work. The errors found were sorted out by the researchers.

The teachers, students and experts ensured validity. In the pilot study, teachers and students shared their valuable thoughts regarding test instruments. Besides, experts and researchers were conscious about the language, instruction, illustration, rural-urban context, and the length of test instruments.

ETHICAL CONSIDERATIONS

There was nothing to be included in this study which would be harmful to students from legal and medical ground. A verbal consent was taken before collecting information. The confidentiality of information was guaranteed.

LIMITATIONS OF THE STUDY

To properly evaluate the impact of this programme, one year may not be enough. However, the use of randomized controlled trials could help avoid the challenges of choosing an equivalent comparison group, but it was not feasible during the selection of working areas or schools. The use of biometrics or haematological analysis could reliably establish the nutritional status of the students, and is a measure that we should seek to employ in the future.

CHAPTER 4

FINDINGS

SOCIO-ECONOMIC PROFILE, PARENTAL EDUCATION AND RELATED FACTORS

A total of 4,602 students were sampled and their socio-economic information was collected. Nearly 72% of the sampled students from intervention schools were from government primary schools (GPS), 20% from registered primary schools (RPS), 6% from BRAC primary schools (BPS), and 2% from BRAC pre-primary schools (BPPS). Same proportion was maintained for selecting students' from control schools.

Table 7. Socio-economic background of the respondents

Indicators	BRAC Rural		BRAC Urban		Banchte Shekha	
	Intervention	Control	Intervention	Control	Intervention	Control
HH size (mean)	4.9**	4.7**	5.1	4.9	5.6*	5.9*
Earning member in HH (mean)	1.4	1.5	1.7	1.7	1.3	1.3
Average income of HH	12789.7	12052.9	13279.3**	15018.1**	10353.9	9944.5
Average land (in decimal)	45.2	49.4	18.6	15.9	59.5	52.4
Landless HH (%)	6.3*	3.9*	25.1	20.0	2.9**	0.3**
Sale labour at least 100 days in a year (%)	42.9	44.8	61.6**	49.0**	40.8	41.7
Learners have working mother (%)	22.2*	28.0*	31.4**	27.0**	6.1*	3.7*
Having electricity at home (%)	68.0	66.8	99.6	99.2	43.7**	51.9**

* denotes significance level at 5%, ** denotes significance level at 1%

Table 7 presents socio-economic background of the students which indicates almost similar features between the intervention and control groups. The average household size of the students was around five in BRAC intervention schools but it was 5.6 in the schools under Banchte Shekha. Although no difference was observed in the intervention and control groups in BRAC urban area but it was higher in BRAC rural intervention schools than their control counterparts and an opposite scenario in Banchete Shekha site. Earning member was more in the urban site than the rural sites but no difference was observed between intervention and control schools in any of the sites. A reflection of this was observed in the average income of the households where the urban site surpassed the rural sites. Statistically significant difference between intervention and control schools in terms of household income was observed only in the urban site. Rural households were much ahead of the urban households in terms of land holding. Again, Households of Banchte Shekha had more land than those in BRAC area. It is important to note that, no difference between intervention and control groups was found in any of the sites. Urban households were also ahead of the rural households in terms of selling manual labour, having working mother and electricity at home. Although 61.6% of the households of the students of intervention schools in BRAC urban area were labour selling it was 49% in the control schools of the same ($p<0.01$). However, no difference was observed in other two sites. Intervention verses control difference was observed in all three sites in terms of having working mothers.

Banchete Shekha control school students were ahead of their intervention school students in terms of electricity at home ($p<0.01$).

In terms of yearly food security status of the households, Banchete Shekha intervention students were more vulnerable than others with 27.9% always or sometimes in deficit (Table 8). They were followed respectively by the students of BRAC urban (24.7%) and rural (15.3%) intervention schools. Although no difference was observed between intervention and control groups in BRAC rural and Banchte Shekha areas control students of BRAC urban area were better off than their respective intervention groups.

Table 8. Percentage distribution of households by yearly food security status, study site and intervention

Food security status	BRAC Rural		BRAC Urban		Banchte Shekha	
	Intervention	Control	Intervention	Control	Intervention	control
Always in deficit	3.7	2.2	6.3**	3.1**	7.0*	10.7*
Sometimes in deficit	11.6	11.6	18.4**	7.4**	20.9	18.8
Breakeven	18.7	18.4	36.0*	42.3*	30.1	29.7
Surplus	66.0	67.7	39.4*	47.2*	42.0	40.8

* denotes significance level at 5%, ** denotes significance level at 1%

The intervention areas varied in terms of main source of household income (Table 9). Non-agricultural activities were the main source of household income in BRAC intervention areas, both rural and urban. The sources include labour sale, salaried job, business, rickshaw/van pooling, boat sailing and driving. These collectively covered 78% of the rural and 96.6% of the urban households. On the other hand, 44.2% of households in Banchte Shekha intervention area had agricultural activities as main source of income. In most cases, no difference between the intervention and control groups was found.

Table 9. Percentage distribution of household's by main source of income, study site and intervention status

Main source of HH income	BRAC Rural		BRAC Urban		Banchte Shekha	
	Intervention	Control	Intervention	Control	Intervention	control
Agriculture	8.9*	13.1*	0.3	0.0	26.4	28.9
Agricultural labour	8.5	11.0	0.8	0.1	17.8	16.2
Non-agricultural labour	24.4	23.1	33.0*	27.7*	12.0	11.4
Salaried job	19.2	18.2	14.8**	21.2**	13.0	10.6
Business	23.5	19.6	29.3	31.6	16.1	19.2
Rikshaw/van pooling/Boat sailing/Driver	10.7	9.0	19.5	18.2	7.2	9.7
Others***	4.7	6.0	2.3	1.2	7.5*	4.1*

* denotes significance level at 5%, ** denotes significance level at 1%
***Household work, foreign remittance, others

PARENTAL EDUCATION

Intervention and control groups in all three study sites varied significantly in terms of fathers' education of the students. In rural sites, the fathers of the intervention schools were more educated compared to those in the control schools. However, an opposite

scenario was observed in the urban site. For more details see Table 10. Almost similar trend was observed in the case of mother's education (Table 11).

Table 10. Percentage distribution of students by fathers education, study site and intervention status

Education level	BRAC Rural		BRAC Urban		Banchte Shekha	
	Intervention	Control	Intervention	Control	Intervention	control
No education	43.8**	53.1**	32.7**	24.5**	45.8*	53.6*
Below primary	17.3	16.3	14.5	13.1	14.0**	8.7**
Primary	11.6	10.9	17.1	18.5	12.2	12.1
Secondary or more	27.2**	19.8**	35.7**	44.0**	27.9*	25.6*

* denotes significance level at 5%, ** denotes significance level at 1%

Table 11. Percentage distribution of students by mothers education, study site and intervention status

Education level	BRAC Rural		BRAC Urban		Banchte Shekha	
	Intervention	Control	Intervention	Control	Intervention	control
No education	43.5	47.7	39.6*	32.2*	39.8	42.9
Below primary	22.0	20.0	17.4	17.7	16.6	17.8
Primary	10.6	13.5	21.6	24.7	19.1	18.9
Secondary or more	24.0*	18.8*	21.4	25.5	24.4	20.4

* denotes significance level at 5%, ** denotes significance level at 1%

COGNITIVE AND EDUCATIONAL FEATURES

Inside story: class participation

Classroom participation of the students and other issues were investigated in randomly selected two schools from each of BRAC urban (one GPS and one BPS) and Banchte Shekha (one GPS and one RNGPS) project sites and three schools from BRAC rural site. Each of the seven schools was visited for three consecutive days. Non-participant observation technique was applied. This means that the observers did not participate or make any comment on any activities; however, they talked to the teachers whenever needed. More female teachers were found than the males. Teachers' age ranged from 22–55 years and their teaching experience ranged from 0–35 years. Subject-based teachers were found in all schools except BPS; and most of them received relevant training from Primary Training Institute (PTI) and other organizations. BPSs are single-teacher schools who are females. They received foundation training and got regular monthly refreshers training. The BPS classrooms were made of tin with mud floor. The students sat on carpets and kept textbooks, exercise books, slates, chalks, pencils, and scales in front of them. The blackboards were usually hanged on the northern wall. The teachers sat on tools near the blackboards. On the other hand, the formal school buildings were made of bricks, where the students sat on benches and the teachers used tables and chairs in front of blackboards. BPS had 30-33 students each but formal schools accommodated almost double students.

Teaching methods

Usually in every school the class started with exchanging *salam* and greetings. Then the teacher asked students whether they did their home tasks. Review of the previous day's work was done only by BPS teachers by asking questions from that day's contents. In other schools, the teachers straight away started their lectures. They applied traditional lecture methods. The students had to follow their teachers. To start with, the teachers first used lecture method a bit, then used examples and finally gave some tasks to accomplish in the class. Besides, teachers asked questions and checked home/class work in the classroom. No teacher encouraged the students to ask questions, but few of them rarely sought explanations of some issues. Group works were seen to be held in rural and urban BPSs. Frequent use of guide books was found in class five only in both type of schools. Teachers used their lesson plans. Use of any other educational aid was found absent in the class. BPS students did some additional activities like recitation of poems and group-singing.

Student's retention and liveliness

Foods were served at three different times– before, middle and after school hour. In one school from Banchte Shekha working area, the authority slightly squeezed assembly time to accommodate food distribution. In two formal schools in BRAC urban and Banchte Shekha working areas, they adjusted this with tiffin period. In rest of the schools, the students had to stay in school 30 minutes more after finishing official contact hours. Additionally, the teachers were also found to take care of food distribution process spontaneously. The class teachers maintained discipline during food distribution and observed entire process. BRAC and Banchte Shekha officials were also communicated as required. The students were seemed to be happy and eagerly waiting for food. The students who took food before start of school hour, all of them attended in classes and there was no record of leaving school early. Similar situation was observed in rest of the schools. It was also revealed from class observation that almost every student paid attention to classroom activities. A very few students were found chatting with their peers in formal schools in BRAC urban and Banchte Shekha working areas. Although the numbers of students were relatively large and the teachers followed lecture method in formal schools, the students replied to their teachers' questions and performed their class work timely. This means, in spite of some barriers they could concentrate in study. Quantity of food was enough for the students which helped them to be more energetic and created a positive environment for learning.

Time management in school

After involving with SNP, each school had to make some changes in their activities. They made adjustments in their assembly time and break (or tiffin) time. The two most common observations were that the length of the immediate past class of food distribution was 5–15 minutes shorter than officially scheduled and that teachers were 5–15 minutes late for the following class. The obvious reason for this mishap is that teachers used to quit class a bit early. Also, they took time to keep the students disciplined after having meal and more so since the teachers had their own meal during the same break. Further, pupils (particularly in lower grades) were typically too excited at the prospect of meal and become less attentive in the classroom particularly in the immediate past period of food distribution. Indeed, there is an issue with time management which can be amended with strong and continuous monitoring.

Attendance, drop out, pass and repetition rate

Table 12 presents terminal examination participation, pass and scholarship achievement rates of the students in intervention and control schools in three different sites. Students, who were in grade V in November 2011, were considered eligible to sit for the terminal examination of grade V. The participation rate was found higher in BRAC urban control schools than the corresponding intervention schools (91.7% vs. 94.9%). The gap was much higher in Banchte Shekha area. This was one percentage point higher in BRAC rural intervention schools than their corresponding control schools. The pass rates were almost 98% or above in most of the cases. Very small difference was observed between intervention and control schools in terms of pass rate. Among the participants 0.7-2.5% got scholarship in Banchte Shekha programme area.

Table 12. Terminal examination participation, pass and scholarship achievement rates by intervention site and type, 2011

Average	BRAC Rural		BRAC Urban		Banchte Shekha	
	Intervention	Control	Intervention	Control	Intervention	control
Terminal exam participation rate	91.8	90.7	91.7	94.9	84.4	93.2
Terminal exam pass rate	100.0	98.9	98.3	99.6	99.2	97.7
Scholarship rate	0.0	0.0	0.5	0.0	0.7*	2.5*

* denotes significance level at 5%

To calculate attendance rate of the students' three random visits were made in each study school and head count of the students was done. Table 13 provides grade-wise as well as overall attendance rates by intervention site. The rate was highest in BRAC rural intervention schools than the other two. Statistically significant difference between intervention and control schools was also observed at this site. Grade-wise analysis shows no difference between intervention and control groups in most of the cases. Attendance rates were relatively higher in grade five due to coaching classes as part of preparation for terminal examination.

Table 13. Attendance rate by grade and intervention site and type

Grade	BRAC Rural		BRAC Urban		Banchte Shekha	
	Intervention	Control	Intervention	Control	Intervention	control
Pre primary	87.6	84.3	68.7	75.4	71.0	71.4
Grade 1	81.3	67.9	64.5	63.4	74.4	74.5
Grade 2	80.2	67.3	65.1	67.1	76.1	75.9
Grade 3	85.3*	68.0*	70.4	74.0	72.0	76.2
Grade 4	82.3	77.9	71.3	74.3	72.7	79.3
Grade 5	90.1	75.3	79.1*	89.7*	78.4	81.8
All	84.7*	73.8*	70.4	75.4	74.1	76.5

* denotes significance level at 5%, ** denotes significance level at 1%

We also collected grade-wise information from schools on the number of passed, repeated, dropped out, transferred and unidentified (i.e. don't know their information) students of the previous year (2011). Here, we considered only those students who were enrolled in January 2011, and we collected information on their educational status. This means, all the rates were estimated based on the number of enrolled students in January 2011. Table 14 shows average pass rate in the 1st semester examination, dropout, repletion and completion rates of 2011. The grade-wise rates

were placed at annexes 1-8. On an average, more than 80% of the students passed in their 1st semester examination and these rates were not significantly different than the comparison group. Only few students left study before completing the grade which was minimum in Banchte Shekha working area.

Table 14. Average pass, dropout, repletion and completion rate by organization and intervention type (from 2011 year data)

Average	BRAC Rural		BRAC Urban		Banchte Shekha	
	Intervention	Control	Intervention	Control	Intervention	control
Pass rate in 1st semester	88.0	84.7	83.4	81.5	87.7	83.9
Dropout rate	0.6	1.9	0.6	0.7	0.2	0.0
Repletion rate	4.3	6.8	4.8	2.8	11.5	10.4
Completion rate	89.0	88.4	77.0	77.9	78.2	79.8

* denotes significance level at 5%, ** denotes significance level at 1%

Grade-wise repetition usually occurred when students failed in the annual examination. Some of them continued in the same grade for an additional year. Findings revealed that the rates of repetition were highest in Banchte Shekha area compared to the other two areas. After successfully completing one educational year, in BRAC rural area, over 88% of the students enrolled in the next grade in January 2012. On the other hand, nearly 79% completed their grades in Banchte Shekha area. Within the three sites, fewer proportions of students from urban area completed their grade and enrolled in the next year. No significant variation was observed between intervention and control groups.

Mathematics test performance

For assessing students' cognitive capability we conducted a mathematics test only for the students of grade III. A competency-based test was administered in both intervention and control group learners and the results are presented in Tables 18 and 19. Twelve attainable competencies were brought under test. Total number of items was 31.

On average, the students of BRAC urban intervention schools showed the best performance followed by respectively Banchte Shekha intervention schools and BRAC rural intervention schools (Table 15). Again, the students of BRAC rural intervention schools performed significantly higher than the control school students. However, no such difference was observed in other two sites. In terms of achieving all the competencies under test BRAC urban site was at the top followed respectively by Banchte Shekha and BRAC rural sites. Statistically significant difference between intervention and control schools was observed only in BRAC rural site. Competency-wise analysis also shows significant difference between intervention and control schools in most of the competencies in BRAC rural site (Table 16).

Table 15. Mean number of competencies and percentage of students achieving all competencies in Mathematics by intervention site and type

Achieved competency	BRAC Rural		BRAC Urban		Banchte Shekha	
	Intervention	Control	Intervention	Control	Intervention	control
Average achieved competency	7.07**	5.15**	7.87	8.11	7.51	7.38
Achieved all competencies (%)	66.3**	45.8**	82.6	83.0	73.0	74.0

* denotes significance level at 5%, ** denotes significance level at 1%

Table 16. Percentage of achieved competency by organization and intervention in Mathematics

Competency	BRAC Rural		BRAC Urban		Banchte Shekha	
	Intervention	Control	Intervention	Control	Intervention	Control
To write up to crore numbers	58.3*	43.3*	87.1*	79.0*	61.8	60.2
To arrange number (up to crore) in order and compare	56.8*	40.8*	79.6	80.0	63.2	63.8
To add two or more than two numbers (carrying digit and not)	55.8	44.8	69.7	69.0	57.8	51.5
To subtract one number from another (carrying digit and not)	74.9**	53.7**	73.6	80.5	73.5	81.6
To multiply one number by another (multiplicand would be maximum four digit in number and multiplier maximum three digit in number)	63.3**	43.8**	65.2	68.0	56.9	63.3
To divide one number by another (dividend would be maximum four digit in number and divisor maximum three digit in number)	51.8*	37.8*	49.8	54.5	70.1	61.7
To recognized Bangladeshi coin and Taka and use in daily transition	18.6*	8.5*	26.9	32.5	26.0	21.4
To solve problem by using mathematical notation	70.9*	61.2*	60.2	62.0	74.0	71.9
To obtain the concept of common fraction and identify different types of fraction and use it (denominator maximum two digit number)	80.9**	62.7**	82.6	89.5	75.0	81.1
To know the different measurement units of length, weight, volume and area and use it	21.1**	7.0**	18.9*	30.5*	36.8**	21.4**
To know the time measurement units and use it	61.3**	32.8**	79.6	76.0	70.1	66.3
To recognized different geometrical shape of different environmental objects and express it by letters	93.0**	79.1**	94.0	89.5	86.3*	93.4*
Achieved all competencies	66.3**	45.8**	82.6	83.0	73.0	74.0

* denotes significance level at 5%, ** denotes significance level at 1%

Nutritional status of students

Anthropometric measurements are the most basic tools for assessing body composition (Roche *et al.* 1996). There are usually two types of measurements widely used – 1) growth measurements, and 2) body measurements (Gibson 1990). Here, we used

1. Weight for age: to measure under-nutrition, a combination stunting and wasting;
2. Height for age: to measure stunting, an outcome of chronic food deprivation; and
3. Weight for height: to measure wasting, an outcome of acute food deprivation.

Table 17 shows that except BRAC rural control area, the proportions of severely underweight and moderately underweight students were relatively closer in both treatment and control group. The prevalence of underweight was somewhat higher in both the rural sites than that of urban site. Proportion of stunted (severely stunted and moderately stunted) students was more in BRAC intervention areas (both Rural and urban sites; approximately 19%) which was found lowest in Banchte Shekha treatment area (13.8%). Thus, the students from Banchte Shekha working area were comparatively better in terms of their height for age.

Table 17. Students' nutritional status in terms of different anthropometric index by intervention site and type (in %)

Index	Nutritional Status	BRAC Rural		BRAC Urban		Banchte Shekha	
		Intervention	Control	Intervention	Control	Intervention	Control
WAZ[a]	Severely Underweight	5.9	6.7	5.7	5.9	4.9	5.7
	Moderately Underweight	22.9	25.4	17.9	19.5	20.1	20.9
	Normal	71.2	67.9	76.5	74.6	74.9	73.5
Sample size		507	504	442	456	586	565
HAZ[a]	Severely Stunted	5.8*	3.4*	4.4	2.9	3.6	3.6
	Moderately stunted	13.5	13.5	14.8	13.6	10.2*	13.8*
	Normal	80.7	83.1	80.8	83.5	86.2	82.6
Sample size		761	756	777	771	753	753

[a] Weight for Age Z score (WAZ) and Height for Age Z score (HAZ)
* denotes significance level at 5%, ** denotes significance level at 1%

Food security situation

Food security is a measure to assess access to food physically and economically all the time to ensure supply of required energy, and macro and micronutrients for maintaining healthy, active and productive life. It refers to a household's ability to provide physical and economic access to sufficient, safe and nutritious food that fulfils dietary needs and food preferences for living an active and healthy life. According to WHO food security is built on three pillars[2]:

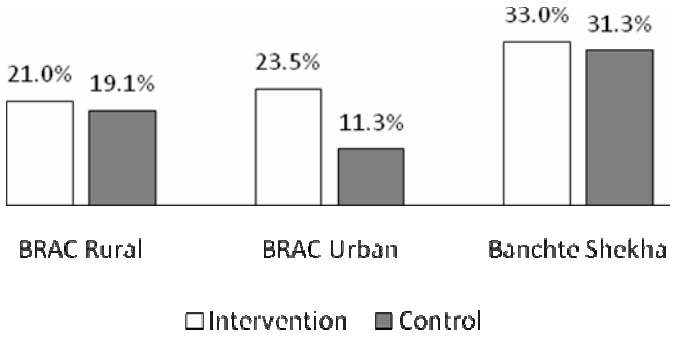
- Food availability which means sufficient quantities of food available on a consistent basis.

[2] http://www.who.int/trade/glossary/story028/en/

- Food access indicates having sufficient resources to obtain appropriate foods for a nutritious diet.
- Food utilization describes appropriate use based on knowledge of basic nutrition and care, as well as adequate water and sanitation.

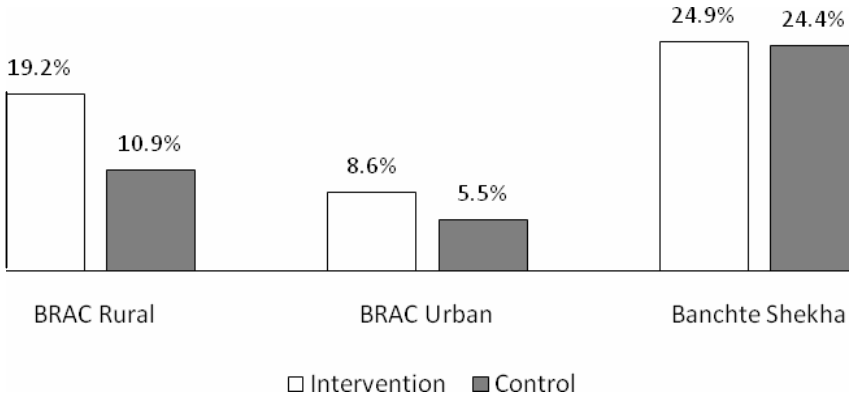
Figure 2 shows the proportion of households unable to buy food due to shortage of money. In BRAC rural area, 21% of the intervention households were found to be unable to buy food due to scarcity of money which was comparatively lower in control area (19.1%). In BRAC rural site, proportionately more treatment households were incapable to buy required amount of food compared to the control households; the figures were respectively 23.5% and 11.3% ($p<0.01$) A third of the Banchte Shekha intervention households had such situation compared to 31.3% among the control households in the same site.

Figure 2. Proportion of households unable to buy food due to shortage of money by intervention site and type



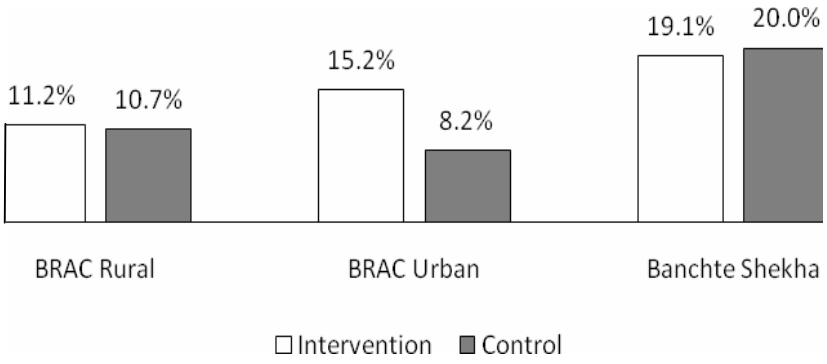
Members of 18% of the households suffering from food scarcity ate less due to such condition. Proportion of such households was more in the Banchte Shekha working area, less in BRAC rural working area and least in BRAC urban working area (Fig. 3). However, difference between intervention and control households was most in BRAC rural site (19.2% vs. 10.9%) and least in Banchte Shekha site (24.9% vs. 24.4%). These figures were respectively 8.6% and 5.5% in the intervention and control households in BRAC urban area.

Figure 3. Proportion of food scarcity households where the HH members ate less by intervention site and type



Food scarcity also forced the household members to reduce number of meals per day. Nearly one-fifth of the households who had food scarcity adopted this option in Banchte Shekha working area (Fig. 4). In BRAC rural area, the treatment and control groups seemed alike in this matter. Proportion of cut meals households in the control group of BRAC urban area was approximately half of its treatment group. Inadequacy of food might lead to insufficiency in essential micronutrients. Banchte Shekha might take various income generating activities that helped improve economic condition to acquire adequate foods in a sustainable manner.

Figure 4. Proportion of households cut meal due to shortage by intervention site and type



Nutritional knowledge and practices at household level

Mothers of intervention areas were found to be more knowledgeable than control areas in naming the foods providing energy. It could be an impact of knowledge dissemination activities on nutrition and hygiene by the implementing organizations. In BRAC control area, the mothers were seemed to be less knowledgeable (19.5%) on this issue (Table 18). Regarding knowledge about body building food, the mothers from Banchte Shekha working area found to be more informed compared to others. In BRAC urban area, these proportions were low, whereas mothers were comparatively better educated in urban area. Besides, more mothers in treatment area were also found to be knowledgeable about the sources of food preventing diseases whereas the counterpart in control group found lesser. Similar trends were observed in the case of knowing sources of food 'preventing night blindness' and 'iodine deficiency disorders'.

Table 18. Mother's nutritional knowledge by organization and activity type (in %)

Knowledge about	BRAC Rural		BRAC Urban		Banchte Shekha	
	Intervention	Control	Intervention	Control	Intervention	control
Energy giving food	31.4**	19.5**	43.4	38.7	54.9**	42.9**
Bodybuilding[3] food	76.3	79.2	72.4**	62.6**	88.4	86.8
Disease preventing food	74.8**	65.2**	56.6**	47.9**	80.4*	75.8*
Night blindness preventing food	89.9	82.1	76.8	78.8	86.7	86.4
Anaemia preventing food	87.7	86.1	75.8	72.2	84.5*	79.6*
Diseases causes by iodine deficiency	37.1*	30.3*	35.8**	44.0**	48.3**	38.3**

* denotes significance level at 5%, ** denotes significance level at 1%

[3] Protein based foods that help muscle building for younger.

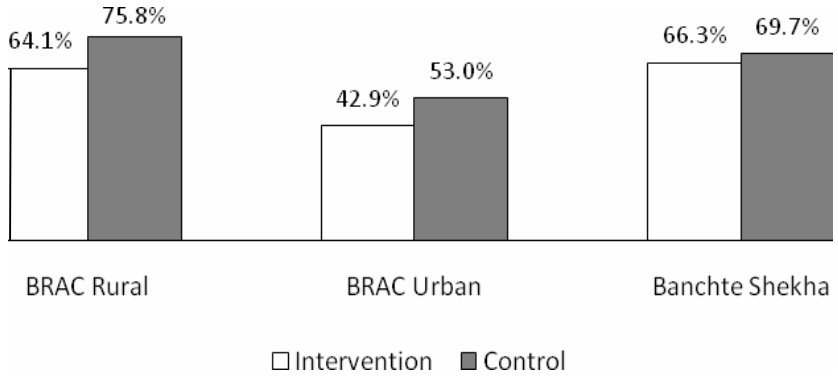
Table 19 shows mothers' knowledge on contamination caused by microbes and way of preventing hookworm. Except Banchte Shekha intervention area, more than 90% of the mothers had knowledge on water-borne diseases. These proportions were found higher in all control groups compared to their counterparts. Almost every mother from BRAC rural area gave importance on trimming nail regularly. More than 97% of the mothers from each group were able to state at least one cause of diarrhoea. Similar findings were revealed about awareness to prevent hookworm manifestation.

Table 19. Mother's knowledge on prevent contamination by organization and activity type (in %)

Knowledge about	BRAC Rural		BRAC Urban		Banchte Shekha	
	Intervention	Control	Intervention	Control	Intervention	control
Drinking safe water	94.0	95.0	90.7	97.5	87.6	90.4
Necessity of nail trimming	99.2	99.5	94.1	96.8	96.5	97.0
Causes of diarrhoea	98.6	97.8	97.2	98.8	98.6	97.9
Necessity of drug to prevent hookworm	97.9	99.0	98.2	99.6	98.6	99.2

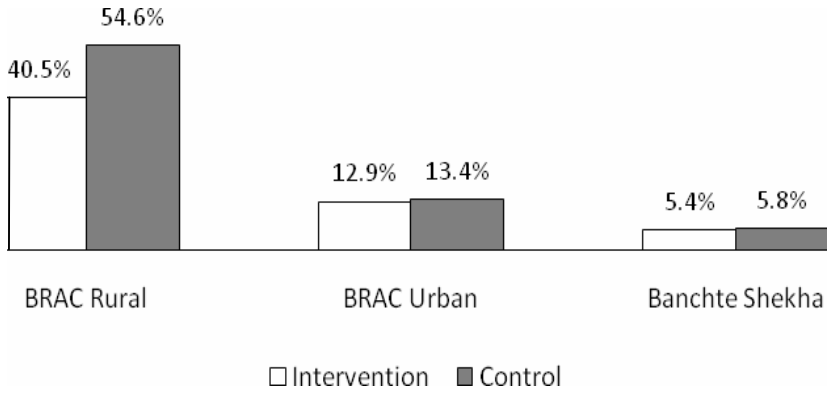
Green leafy vegetables are powerhouse of vitamins (B, C, E and K), minerals (including iron, calcium, potassium, and magnesium) and fibre. Proportion of households regularly consuming green leafy and non-leafy vegetables was found to be lower in urban area (Fig. 5). Significantly highest proportion of households (75.8%) in BRAC rural control area were found to be consumed green leafy vegetables regularly than the respective comparison group.

Figure 5. Proportion of household regular consume green leafy and non-leafy vegetables organization and intervention type



Coloured fruits and vegetables are rich sources of micronutrients, vitamins, mineral, enzymes and fibres. Figure 6 provides proportion of households regularly consumed coloured fruits and vegetables. The proportion was much higher in BRAC rural area compared to the other two areas. However, the rate was higher in the control than the intervention group (54.6% vs. 40.5%). About 13% of the households in BRAC urban area and nearly 6% of those in Banchte Shakha area consumed colourful fruits and vegetables with no difference between intervention and control groups. Lowest rate of consumption of coloured fruits and vegetables in Banchte Shekha working area restricted availability of broader range of nutrients. So, more promotional activities to strengthen nutritional knowledge at community level are required.

Figure 6. Proportion of households regular consumed coloured fruits & vegetables by intervention site and type



Use of iodised salt is a common technique to prevent iodine deficiency in human body. Figure 7 shows the proportion of households used iodized salt regularly. Households of BRAC intervention and control schools in both rural and urban areas were more likely to use iodised salt regularly. Over 97% of the households from rural area and 98% of those in urban area used iodised salt. The figures were much less in Banchte Shakha area with sharp difference between intervention and control households (92.1% vs. 80.1%).

Figure 7. Proportion of households regularly used iodized salt by intervention site and type

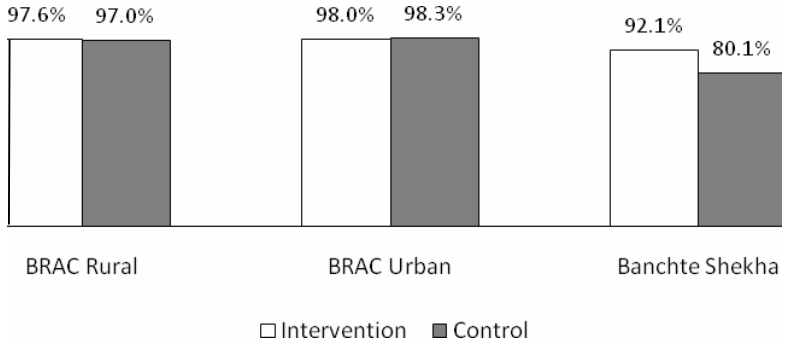


Table 20 shows the percentage of students and their mothers who maintained several personal hygiene practices by intervention site and type. Washing hands with soap and water is a basic technique to prevent diseases especially before food preparation, serving and intake, and after using toilet. The mothers of more than 95% of the students always washed their hands before serving food for the family members which was slightly lower (>92%) in urban area.

Table 20. Hygiene practices at household level by intervention site and type (in %)

	BRAC Rural		BRAC Urban		Banchte Shekha	
	Intervention	Control	Intervention	Control	Intervention	control
Mothers' always wash hand before food distribution (%)	96.7	97.4	92.1	93.3	95.1	97
Mothers' sometimes wash hand before food distribution (%)	3.3	2.5	7.4	6.7	4.9	3.0
Students' always wash hand before taking food (%)	99.2	98.8	99.5	99.5	98.2*	99.7*
Students' sometimes wash hand before taking food (%)	0.8	1.2	0.5	0.5	1.8	0.3
Students' cut nails (%)	92.4*	89.4*	97.1	96.5	95.9	97.6
Mothers' cut nails (%)	94.2	93.9	99.0	97.9	97.1*	99.2*

* denotes significance level at 5%

Around 5% of the mothers sometimes washed their hands before serving food to others. The students (99%) always washed their hands before taking food. For trimming nails regularly both mothers and students found to be cautious, and mothers found to be more careful compared to their children.

Table 21 shows that, most of the households in rural areas used tubewell as main source of drinking water, while it was supply/tape water in urban area. Around 1% of the households collected water from pond, river or well. Nearly 1% of the households from BRAC rural area boiled or used filter for disinfecting water. This proportion was much higher in BRAC urban area with significant difference between intervention and control groups (63% vs. 76.5%). In Banchte Shekha intervention group, over 5% of the households purified water after collecting it from tubewell or other sources.

Table 21. Water and sanitation facilities at household level by intervention site and type (in %)

Facilities	Type	BRAC Rural		BRAC Urban		Banchte Shekha	
		Intervention	Control	Intervention	Control	Intervention	control
Source of drinking water	Tube well	99.1**	95.6**	5.7*	3.0*	99.6*	98.4*
	Supply/tape	0.3	3.9	93.6**	97.0**	0.1	0.1
	Others[#]	0.6	0.5	0.6	0.0	0.3	1.5
Boil/filter water before use		1.3	1.0	63.0**	76.5**	7.5*	5.0*
Types of Toilet used by students	Hygienic[$$]	49.2	48.1	78.3	77.0	58.9	54.0
	Unhygienic[$]	43.5	41.7	19.6	21.5	31.6*	38.3*
	Open/Pit	7.3*	10.2*	2.0	1.6	9.5	7.7
Students use shoes in toilet	Always	91.9**	79.0**	93.1	94.8	82.1	81.9
Student's hand washing after using toilet	Never	0.9	0.4	0.9	0.1	0.4	0.1
	Hygienic[**]	80.5**	68.9**	73.2	75.8	64.5**	56.3**
	Unhygienic[*]	18.6**	30.7**	25.9	24.1	35.1**	43.6**

* denotes significance level at 5%, ** denotes significance level at 1%
[#] denotes pond/river/well
[**] denotes use soap and water, [*] denotes use only water or use soil/ash water
[$$] denotes ring slab toilet with water seal or sanitary latrine, [$] denotes ring slab toilet without water seal

BRAC urban working area was much ahead of the other two in terms of use of hygienic toilet. More than three-quarters of the households of both intervention and control groups of this site used hygienic toilet. The figures were respectively 58.9% and 54% in the intervention and control groups of Banchte Shekha site. Least proportion of households (<50%) using hygienic toilet was found in BRAC rural site. It should be mentioned that none of these differences were statistically significant. The students of BRAC urban site seemed to be more aware of using sandal/shoes in toilet, which was found lesser in BRAC rural control area. More than 80% of the students of BRAC rural intervention area used soap and water to clean their hands after using toilet which was significantly higher for their control group. The students also used ash/soil or only water after using toilet which could be treated as unhygienic process of cleaning hands. Therefore, water and sanitation education and awareness interventions became essential to informing and supporting hygienic practices. Besides, community health workers can be involved in raising awareness on sanitation and hygiene practices during household visits.

MANAGEMENT: FROM FOOD PREPARATION TO DISTRIBUTION

Food materials: procuring and storing

Both the implementing organizations formed a committee in every field site for checking food quality, purchasing raw food items, keeping records of all expenses, measuring quantity and distribution of food. Each committee included an accountant, two programme staff and a programme coordinator. Both the organizations had some financial policies according to which authorization for expenses exceeding Tk. 20,000 in BRAC and Tk. 50,000 in Banchte Shekha was restricted. The programme staff selected the service providers through open tender process.

As reported, price of food ingredients like rice, pulse, oil, and salt increased after every 7-10 days. A field staff termed it as '*boro bazaar*'. Both the organizations maintained stock register. They sent daily and weekly reports to their concerned offices. The head office staff physically checked the stock registers, stores for quality and quantity of raw materials. They occasionally visited the local *bazaar* to know the price of vegetables and relevant ingredients. Leafy vegetables were bought one day before the cooking day in BRAC rural area. In BRAC urban area, a caterer was appointed through tender procedure to supply food items on a regular basis, while in Banchte Shekha the head cook purchased these items. In Banchte Shekha the head cook and assistant cook shouldered the responsibility to measure the quantity of raw food materials and use them as necessary.

To understand the entire process of storage, preparation, and distribution of food, we visited two kitchens and three schools in each working area. Each kitchen was visited for two consecutive days. Generally, in every kitchen there was a separate room for storage of food. Except BRAC rural area, other store rooms had improper ventilation system. Less or lack of arrangement of passing fresh air and light might create trouble in ventilation in storeroom. In BRAC rural area, the kitchens usually had enough air circulation and lighting. Moreover, there were four separate rooms for storage, cutting/peeling and washing raw food materials, keeping firewood, and staff living. Thus, the store rooms in BRAC rural areas were merely used for storage. On the other hand, in other kitchens, staff used to keep other equipments like firewood and their personal belongings in the store rooms. The urban store room had electric fan which helped in circulation of air. Besides, one kitchen of Banchte Shekha had a refrigerator for keeping spices and chopped onions.

Generally, in all stores there were several racks (made of wood or plastic) for keeping raw food items, spices and cooking materials as well. In every project area, vegetables were stored without refrigeration. Some vegetables (like leafy vegetable) were stored for 1 to 2 days and some for slightly longer period. For instance, potato, pumpkin, peanut, papaya were stored for 5–10 days. Grains, which included dry food ingredients such as rice and pulse were stored for 10–15 days. Findings revealed that in every kitchen vegetables like *lau*, pumpkin, *borboti* or papayas were found stacked on the floor. Some other vegetables like potato, nut, onion and spices like ginger and garlic were packed in sacks. As mentioned earlier, improper ventilation in storage created warm and moist environment which is known to potentially deteriorate the quality of vegetables both in flavour and nutrition. Moreover, perishable and semi-perishable items should not be covered in pot/or sack for long time because that might cause damage. Besides, stored potatoes and onions together produced gases that could have caused rapid decay of other items.

Pest infestations were quite common. Insects such as cockroaches were commonly found in stores, including rats in urban store. Such infestations may cause serious health hazard, as they could spoil foods and their ingredients and potentially cause serious food poisoning. Thus, the staff responsible for those stores should take steps to protect food items from any kind of infestations and damages.

Kitchen: placement, cleanness and waste management

We observed two kitchens from Banchte Shekha, two from BRAC urban, and one from BRAC rural working areas. Apart from the urban kitchens, the kitchens were built in relatively cool places and had adequate space for cutting/peeling vegetables, washing pots and cutlery, storage, gathering cooking fuel and containers, living room for head cook and so on. The two kitchens of urban area were relatively smaller, even though they had to cook food for more than 8,500 students per meal. Urban kitchens engaged more staff (nearly 19 cooks and assistants) which made that small place more crowded and it became tough to maintain healthy atmosphere and follow hygienic norms. On the other hand, rural kitchens provided food to nearly 3,000 students, meaning that rural kitchen staff had less work pressure. Thus, they could observe the health and hygienic regulations carefully. Besides, in urban area the programme staff faced more challenges to rent house and convert it into kitchen. The rent of project office in urban area was drastically higher than the rural area. Moreover, improper drainage system, less scope for changing house structure, complain from neighbours, etc. posed additional challenges for the urban project staff. Among rural kitchens the project staff had less challenges with rent and space, they could use their cooking stove and maintain ventilation properly. For instance, in BRAC rural area, they made a separate office and set up a kitchen according to their requirements. Therefore, in urban area BRAC could rent one or two houses for kitchen and recruited more staff, which would make the system smoother and staff stress could also be reduced.

The kitchen staff disposed off the waste part of raw food items and dirt into bins. The garbage collectors came regularly to collect wastage. They also collected the leftover food (i.e. not taken by students) as well. Kitchen staff members regularly cleaned kitchens, stoves and store rooms. The field staff had the responsibility to monitor the entire process. No kitchens were found to not have had the dirt removed after food preparation.

Food delivery and distribution process

Timely Delivery of food was challenging, especially in urban area. In urban area, several pick up vans were rented to deliver food to the schools. Urban staff was truly hard working. They were seen starting work at 4–4:30 a.m. which continued up to 7 a.m. for food preparation. Containers were used to distribute food. The staff fixed the number of containers according to school, class, section, and size. They noted down the name on each container for a particular school and specific class and section and arranged them systematically. By 7:30 a.m. the pick-up vans were ready for delivering foods. Considering traffic jam, they started their journey to schools two hours earlier, so that food can be served timely. The school authority and the students reported that they were able to maintain the schedule properly.

On the other hand, in rural areas the programme staff engaged several rickshaw vans to deliver foods to the schools. As the rural schools had lesser number of students and having time in hand due to no traffic jam they started work a bit later. They prepared food by 9:00 a.m. and it took less time (not more than 30 minutes) to reach schools. The rural staff also kept marking the name of schools, classes, and sections on the containers. In BRAC rural areas, the van drivers were found to transfer food from large containers to small containers, and in Banchte Shekha site they also participated in food distribution. The van drivers usually wear unclean clothes and might not have maintained hygienic norms. Thus, there might have been a risk of food contamination.

To understand the entire food distribution process and school activities, we observed six schools (two schools from each area) in three consecutive days. School and students' cleanliness, hygiene practices, cleanliness of mothers' club members and their hygiene practices, food distribution process, and cleanliness of plate, glass or cooking pot were also observed.

From Banchte Shekha working area

The level of cleanness in both the schools was not up to the standard. The school play grounds were full of waste papers, dry leaves and other dirt. The houses next to schools and schools' own disposals were gathered in one side of play ground polluting the surrounding air. One school had two tubewells, one was working. Another school had one functioning tubewell. One school had two non-functioning toilets. Students of this school used an open place for defecation/urination which was a bit far from school. It was obvious that they did not use basic sanitation such as water or soap for washing hands. Another school had two toilets but without water, sandals and soap. Hand washing facilities were found in both the schools, but there was no soap. After completing the first day of observation, glycerine soap was provided in one school for hand washing. Banchte Shekha provided plastic tanks to both the schools for water storage, one of which was in use while the other one was abandoned. The school authority kept it in a room and it remained unused. The students of the school, which had no soap, used only water for hand washing. Very few of them used ash instead of soap. In the other school, where soap was found a bit later, very few of them washed their hands in a proper manner. A tendency of not washing hands before taking food was also observed in both the schools. Food distribution time was limited. Hand washing facility was also limited considering the number of students. Thus, students got very little time to wash their hands properly and wanted to do it quickly. Therefore, there was high possibility to transmit germs. Furthermore, there was no napkin found for hand wiping in any of the schools. Most of the students used their clothes to wipe hands. In one school, we found that the students were divided into two groups in two

classrooms and the food was distributed there. In another school, the students were waiting in the playground for food; food was served there in the play ground. Taking food in open air might be contaminated by dust. The programme staff should rethink this issue.

In both the schools the mothers' club members arrived on time. They did not use their apron, cap, mask or gloves. They tied their hair in back and trimmed their nails. However, some of them spat out as they were habituated. None was apparently found with skin or infectious diseases. They usually came 15 to 20 minutes before serving food. They washed the plates and glasses with ash and clean water and gathered them into floor. Before serving food, none of them washed their hands with water or soap. However, some of them washed their hands when they washed plates and glasses. Moreover, in one school, the van driver (who delivered food in school) was found to be involved in serving food to the students. Banchte Shekha could take several steps like refreshers training and monitoring to ensure the use of apron, cap, mask and gloves and thorough washing of plates and glasses. Foods were found hot and the containers were clean. The teachers were willing to help students disciplined during food distribution. It took 10-20 minutes more for completing the whole task.

BRAC rural and urban working areas

We have chosen four schools where BRAC implemented SNP activities (equally divided in two working areas). Two of them were formal and other two were BRAC primary schools. Two formal schools had similar standards as the school of Banchte Shekha working area with regards to cleanness, toilet and hand washing facilities. Inadequate and dirty toilets and lack of hand washing facilities hampered students' personal health and hygiene practices. Lack of access to proper sanitation and safe water could cause diarrhoea and other diseases. BEP may take a joint venture with WASH and other programmes to improve this condition. Additionally, sanitation and hygiene education is highly needed at household level. There was a scope to work with community-based health workers of BRAC Health Nutrition and Population Programme for knowledge dissemination and follow-up their practices at household level. One of the two BRAC schools had a usable toilet, while another school had no toilet. The students reported that since most of them came from nearby communities, in case of necessity they could use toilet at their home or friend's house.

BRAC schools were found clean because the students cleaned their classrooms before starting classes and left their sandals outside the room. On the other hand, the formal schools were found full of dirt and the school authority seemed to be uninterested regarding this issue. The students of BRAC schools brought drinking water from their homes because of unavailability of drinking water in school. There were facilities for drinking water in formal schools.

In both types of urban schools, the absenteeism of mothers' club members was frequent during food distribution. In one BRAC school, it was found that no mother came on that day, so the teacher went to a nearby member's house and requested her to serve food. That member served food when no one was available and sometimes she had to serve 2 to 3 days in a week. In urban area more mothers engaged in income generation activities. Therefore, few or none of them got time to join mothers' club. Less use of apron, cap, mask and gloves were found among the mothers' club members. They wore clean clothes and their hairs were also tied back. Their nails also trimmed and none was apparently found of having any infectious diseases in collocation time.

BRAC provided a tiffin box and a spoon to each student. They were also instructed to bring their drinking water and a napkin from home. Mothers' club members served food in their tiffin boxes. The students put their napkin on the desk/mat and put tiffin box on it and had food by using spoon. Every student had to maintain cleanness of their tiffin box and napkin as well. The BRAC officials and mothers' club members checked the cleanness before serving food. This mechanism was found effective for preventing contamination of germ.

PERSONAL HYGIENE OF COOK AND MOTHERS' CLUB MEMBERS

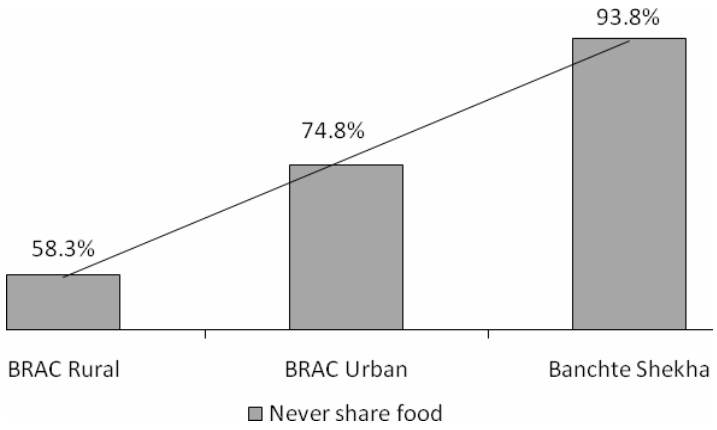
The cooks and their assistants and the members of mothers' club received training on personal hygiene and food safety in kitchen from their respective organizations for 15 days, 6 days, and one day respectively. Wearing apron, hand gloves and cap was essential part of their activities which were rarely followed in the kitchens. It was observed that staff of the organizations was less concerned about using apron, gloves and cap in the kitchen. They wore clean clothes but were indifferent in using their apron and gloves. The female staff tied their hair back but did not use cap. Some of the female staff was found to wear bangles. Moreover, the kitchen staff and mothers' club members kept their finger nails trimmed, but use of nail polish was not noticed. No cook was found to smoke or use tobacco in their working area. One of the staff in an urban kitchen was on sick leave. However, no one was seen suffering from infectious diseases or symptoms of illness (such as flu, diarrhoea, vomiting, jaundice, fever, sore throat, skin disease and abdominal pain) was not viewed among the kitchen staff. Coughing or sneezing by kitchen staff was found at Banchte Shekha and BRAC urban Kitchen which was not in line with the established good hygiene etiquette. Most of them did not wash their hands with soap after coughing or sneezing. They were found sweating as they were working near fire, although the Banchte Shekha kitchen staff used personal towel to wipe it.

Nine male and nineteen female staff worked together in one kitchen of BRAC urban area. They used one toilet which seemed to be inadequate. They did not use sandal while using toilet, but washed their hands and legs with water after defecation, as they mentioned. In one of the Banchte Shekha's kitchen, their staff used toilet shared with community people. All other programme sites had clean toilets and hand washing facilities. Periodical refresher training on health, hygiene and food safety including mandatory follow-up may be an option to improve.

FREQUENCY OF TAKING AND SHARING FOOD AT HOME AND SCHOOL

It was observed that more than 93.8% of the students from Banchte Shekha, 58.3% from BRAC rural and 74.8% from BRAC urban sites consumed the entire amount of food served (Figure 8). This proportion was significantly ($p<0.01$) lower in BRAC served area. As mentioned earlier, BRAC provided tiffin box to each student. Therefore, they got a chance to take food home and share with their family members. The proportion of students not sharing food was higher in Banchte Shekha, which might be due to distribution of food on plate.

Figure 8. Proportion of students never share their served meal by organization type



The students who did not finish their entire food in school usually shared it with their family members (Table 22). This was 57.3% in the case of BRAC rural and 25% in the case of BRAC urban site. A portion of the students could not finish because of having less appetite. Nearly 40% of the students in BRAC urban intervention site didn't like the same food everyday; this was 24.3% in Banchte Shekha site and 8.5% in BRAC rural site. On the other hand, 40.5% of the students of Banchte Shekha intervention site reported that the served food was not tasty.

Table 22. Reason for not finishing served food by implementer organization (in %)

Reasons	BRAC Rural	BRAC Urban	Banchte Shekha
To take it for the family members	57.3	25.0	0.0
Had less appetite/didn't wish to finish	17.1	14.8	16.2
Didn't like same food everyday	8.5	39.8	24.3
Didn't like a particular food	8.5	9.7	13.5
Not tasty	2.6	6.8	40.5
Others*	6.0	5.0	5.4
Total	100.0	100.0	100.0

*This includes already had food from home, this food is not much healthy, too hot to finish quickly, food quantity is a lot for a person

On an average, 81% of the students were satisfied with the quantity of food served, nearly 15% reported that the quantity of food was more than sufficient and almost 1.6% reported they required more. Thus, the proportion of students with adequate food was 99.1% in BRAC rural and 97.2% in BRAC urban sites and 98.8% in Banchte Shakha site. No difference between the bays and the girls was observed in BRAC urban and Banchte Shekha intervention schools (Table 23). However, in BRAC rural schools, girls were found significantly dissimilar compared to their counterparts boys (78.7 vs. 85.4%; $p<0.05$).

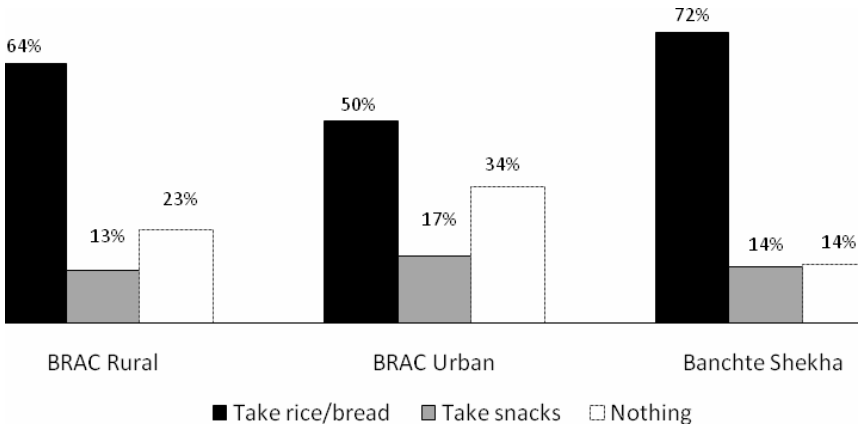
Table 23. Opinion on served food quantity by sex and implementer organization (in %)

	BRAC Rural		BRAC Urban		Banchte Shekha	
	Boys	Girls	Boys	Girls	Boys	Girls
Surplus	13.7*	20.4*	15.2	16.6	15.5	18.1
Sufficient	85.4*	78.7*	81.8	80.7	83.6	80.4
Less	0.9	0.9	3.0	2.7	0.9	1.4

* denotes significance level at 5%

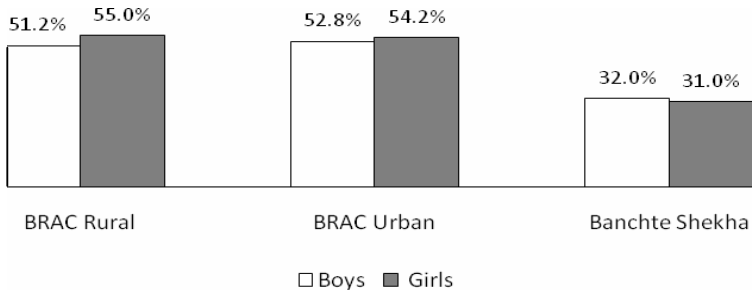
The students could get food at three different times like before starting their classes, in the middle of the classes (i.e. in tiffin time), and at the end of the classes. They usually took either some heavy food like rice/bread or light snacks after finishing school. Figure 9 shows that 72% of the students from Banchte Shekha working area took rice/bread after going home from school. This was 64% in BRAC rural and 50% in BRAC urban intervention sites. Food was served at tiffin time or at the end of the school hours in a large proportion of schools in BRAC urban site. As a result, 34% of the students of those schools did not need to take any food at home after school hour.

Figure 9. Distribution of students by intervention site and food type taken at home after school hour



On an average, 46.2% of the students in the intervention schools took less food at home after introduction of SNP. This figure was 53.3% in BRAC rural and 53.6% in BRAC urban sites and 31.4% in Banchte Shekha site. Proportion of such student was almost equal in Banchte Shekha intervention schools (Figure 10). However, proportion of girls was slightly higher than that of the boys in BRAC working site.

Figure 10. Proportion of less food intake after serving food in school by sex and organization



PROCESS OF MONITORING AND SUPERVISION

Setting of indicators and follow-up of the activities based on the set indicators are very much essential for quality assurance of any programme. As a new intervention still it is not feasible to form a structured monitoring system for this programme, but both the organizations already adopted some techniques to do so. These include maintaining stock register, supervising food preparation and distribution procedure, observing activities of mothers' clubs, cooks and their assistants, etc. Table 24 presents existing process of monitoring and supervision system for SNP.

Table 24. Process of monitoring and supervision

Activities done by	BRAC	Common for both organization	Banchte Shekha	Frequency and record keeping
Cook and his assistants	• Head cook supervises their assistants in cooking time	• Measure the quantity of food ingredients according to their given recipe • Kitchen and storeroom cleanness and waste management • Maintain personal health and hygiene	• Head cook buys leafy vegetables and checks their quality • Provides information on expenditures	• Kitchen and storeroom are usually clean once in a week • All others activities are conducted every day • Quantity of food ingredients and expenditures are listed into stock register
Quality Controller/ Food Monitor	• Visit BPS, test food, observe the food distribution	• Check the quality of raw food materials • Maintain liaison with regular vendors • Check quality and price from other vendors • Collect daily food demand • Food delivery on time • Visit one school a day, test food and observe food distribution • Monitor the activities of van/car driver, food distributor and mother's club members • Provides information on expenditures	• Maintain stock register	• Liaison with vendors is usually done 1/2 times in a week • Food quality usually checked after get the delivery and it occurred 2/3 times in a week • Collection of price quotation is treated as monthly activity • Other activities are done by daily basis • Information of expenditure and price quotation is kept into register
Programme Coordinator	• Maintains stock register	• Checks the quality and quantity of raw food materials • Collects report from project staff and send Weekly/monthly report to Head office • Checks school discipline at distribution time • Oversees financial transactions • Ensures proper utilization of resources • Checks personal health and hygiene practices of project staff and waste management		• Check financial transaction occurs when it necessary • Other activities are done on daily basis • Weekly and monthly reports are kept by head office based staff
Head office based staff	• Provide information to internal audit team • Periodical report to BEP	• Visit project area and solve problem • Check field reports		• Visit project site and problem solving occurred when it necessary • Internal audit kept record once in a year

For some of the activities like checking quality of raw food materials or giving report, both the coordinators and other team members worked jointly. Field and head office-based staff sometimes solved problems by discussing with them. It seemed a continuous but not a rigid system. Besides, the staff got scope to discuss their problems or share their thoughts among themselves. However, some more indicators can be included. These may be the amount of food served regularly, the exact time of finishing food distribution process, whether the students cut their nails and washed their hands properly, and serving food exactly on time, class discipline during serving food, availability of soap, sandal, toilet facility and safe drinking water, etc.

STRENGTHS AND SHORTCOMINGS: STAKEHOLDERS' VIEWS

To know the stakeholders' perception about the activities related to SNP, separate FGDs with parents and community people were conducted. Besides, teachers also provided their opinion while interviewed. Overall, all of them welcomed the project. They attended the launching event and got to know how this programme would work. They were pleased to see that the government officials, local elites, and SMC members already knew about the SNP activities and approved it. All the respondents agreed with the necessity of providing nutritious food to the school children. Following are some observations made by various stakeholders.

> It is a very useful programme. I have rushed in the morning; sometimes I cannot prepare breakfast and tell my son to take rice that I cooked last night. But my son does not want to take. If the school provides food regularly I can get relief from the tension of preparing food at home in the morning. – *A working mother*

> My child does not like vegetables, but now she gets vegetables from the *Kichuri,* and eats it because her friends also eat it. – *Another mother*

> In every classroom, there are some students from poor families, who are not much energetic and less active in classroom activities. This feeding programme made them livelier and more attentive in study. – *A teacher*

The community people also expressed similar opinions. Some of the community people and SMC members visited the kitchens several times and expressed their satisfaction with the cooking system and other process. However, there was no systematic review, as observed, by community or other people. When a new activity was started, local people usually became curious and went for a visit. Therefore, a systematic approach might be introduced by the programme authority and the food distribution system at schools should also be observed.

Although the stakeholders seemed happy with the introduction of the project and service provided, they were not happy with the monotonous food. One teacher stated, "At the beginning students were very happy having *Kichuri* in school, but after a month they became less keen to take it." From the three project sites, the guardians, the teachers and the community people repeatedly suggested various types of food. Some of them recommended adding meat or eggs once in a week for increasing students' protein intake. Some of them talked about dry/processed food like bread, butter/jelly, banana, cake, etc. Few of them told about egg noodles, *biriyani* and *tehari*. However, the programme staff reminded us about budget constraints. As per proposal, food cost must be within Tk. 10.50 per meal per student. They also reported that they tried to use different vegetables which would also create variations in taste. In urban area, the staff considered providing processed food like vegetable/jelly beans. A staff from

BRAC rural area mentioned, “We have to consider not only the food price but also the essential nutrients which can remove nutrient deficiency of students.”

The volunteers demanded remuneration. In urban area absenteeism of mothers’ club members was prominent compared to two rural areas. Remuneration may increase their motivation. The teachers from Banchte Shekha working area told that they already paid for buying glasses and they have to pay for the detergent/soap for cleaning plates or washing hands. At the early stage of SNP, the community people from Banchte Shekha working area criticized for using coarse rice which created a bad smell after cooking. Also, some random complaints came from teachers like bran smell, found hair or insect, and so on. But still nothing was found responsible for health or any diseases like stomach upsets or digestion problem among the teachers or students.

CHAPTER 5

LESSON LEARNED

The key strategy of SNP is to develop an effective mechanism to improve educational and nutritional outcomes by engaging local community without interrupting regular school activities. The pilot programme was, to some extent, successful in terms of maintaining food quality, on-time delivery, good impression from the community and students, increasing their retention and attention in classrooms. However, school observations and household visits emphasized some other matters which include access to safe water, washing facilities, and adequate sanitary latrines to reduce health risk. Besides, poor hygiene practices at household level may also be a major cause of illness. This situation can be improved by increasing water and sanitation facilities and promoting positive attitude towards cleanliness. Several community development activities can be implemented including education and learning programmes.

Menu planning is necessary to increase students' interest on food. At least four or five types of recipe can be considered within a week. For increasing students' protein intake, quality protein maize (QPM) including animal protein can be used in preparing *Khichuri*. To combat shortage of vitamin A, orange-fleshed sweet potatoes (OFSP) can be considered as an enhanced source of β-carotene (precursor of vitamin A) in terms of availability in particular area. Some other options like noodles or chick peas can be considered in both rural and urban areas. After serving new food item, it will be more effective to take opinion of the students and teachers. Programme authority of urban area had a second option as processed food which is less nutritious but easy to deliver as they initially planned at the starting of this project. Additionally, an improved diet can be served once in a month containing animal protein as a better source of protein.

BRAC adopted comparatively a better mechanism through serving food in tiffin box which the students clean at home. The Banchte Shekha can provide spoons to the students, so they need not to wash hands at school, which may save time as well. The students also washed their plates at home and brought safe water from home. Moreover, time management is very crucial for both the implementing organizations and teachers. Frequent visit is vital to ensure better implementation of the project.

Refresher training and follow-up for cooks and kitchen staff are also required. Urban kitchen needs more space and better ventilation. Use of apron, mask, cap and gloves should be ensured. Raw food items should be washed before cutting or peeling in order to prevent nutrient loses. The kitchen staff can cut/peel the day before serving and wash them just before cook. Random visits are also essential to check the food preparation. In store, perishable and semi-perishable items should not be covered in pot/or sack as it sometimes may create damage or rotten the food.

To get visible effect, the SNP should be implemented for a reasonably longer period of time than the current one year pilot. If funding continues, the SNP will get the opportunity to improve the design and apply the lessons learned. Increasing involvement with other organizations especially with the World Food Programme can make the implementing organization more effective. The participation of community workers and the local government should be more intensified for effective implementation of the programme.

In summary, the key suggestions for improving the SNP activities are:

- Diversified food menus should be introduced to minimize monotony.
- Refreshers training and workshop with programme staff, cooks and their helpers may improve efficiency.
- A structured monitoring system should be developed to know how the programme works and increase staff accountability.
- Remuneration for mothers' club members especially in urban area should be introduced for ensuring their presence during food distribution.
- The programme should adopt more integrated approach with health and WASH programme.

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ANNEX

Table 1. Average pass rate in 1st semester by grade organization and intervention type (from 2011 year data)

Grade	BRAC Rural		BRAC Urban		Banchte Shekha	
	Intervention	Control	Intervention	Control	Intervention	control
Pre primary	-	-	82.3	89.9	100.0**	71.4**
Grade 1	97.5	86.9	82.7	89.4	93.1	87.9
Grade 2	88.6	78.7	91.2	86.9	90.1	87.4
Grade 3	76.6	77.6	75.6	73.9	87.3	78.3
Grade 4	80.9	86.9	82.0	75.9	81.6	81.8
Grade 5	94.8	93.3	82.0	75.9	85.1	85.8
All	88.0	84.7	83.4	81.5	87.7	83.9

* denotes significance level at 5%, ** denotes significance level at 1%

Table 2. Average pass rate in 2st semester by grade organization and intervention type (from 2011 year data)

Grade	BRAC Rural		BRAC Urban		Banchte Shekha	
	Treatment	Control	Treatment	Control	Treatment	control
Pre primary	-	-	100.0*	91.3*	84.2**	100.0**
Grade 1	95.3	85.6	84.9	90.3	96.2	87.7
Grade 2	94.5	89.4	88.4	83.8	87.4	88.3
Grade 3	83.9	74.2	75.6	79.5	81.3	82.2
Grade 4	95.3	85.9	81.0	81.4	78.5	82.8
Grade 5	99.5	90.7	82.3	75.3	86.9	86.9

* denotes significant level at 5%, ** denotes significant level at 1%

Table 3. Average pass rate in 3st semester by grade organization and intervention type (from 2011 year data)

Grade	BRAC Rural		BRAC Urban		Banchte Shekha	
	Treatment	Control	Treatment	Control	Treatment	control
Pre primary	-	-	94.4	92.5	86.8**	100.0**
Grade 1	91.5	84.7	88.2	87.6	86.6	89.9
Grade 2	83.5	82.9	91.4	90.5	87.0	89.0
Grade 3	94.1	76.4	83.0	82.0	82.3	83.2
Grade 4	93.2	79.6	83.9	86.2	78.9*	99.8*
Grade 5	-	-	-	-	-	-

* denotes significant level at 5%, ** denotes significant level at 1%

Table 4. Average dropout rate by grade organization and intervention type (from 2011 year data)

Grade	BRAC Rural		BRAC Urban		Banchte Shekha	
	Intervention	Control	Intervention	Control	Intervention	control
Pre primary	0.0	0.0	0.0	0.0	0.0	0.0
Grade 1	0.7	0.0	0.0	0.0	0.0	0.0
Grade 2	0.2	1.1	0.4	1.3	0.0	0.0
Grade 3	1.9	3.0	0.7	0.0	0.0	0.0
Grade 4	0.0	1.6	1.9	2.2	0.5	0.0
Grade 5	1.1	4.2	0.0	0.0	0.4	0.0
All	0.6	1.9	0.6	0.7	0.2	0.0

Table 5. Average repetition rate by grade organization and intervention type (from 2011 year data)

Grade	BRAC Rural		BRAC Urban		Banchte Shekha	
	Intervention	Control	Intervention	Control	Intervention	control
Pre primary	0.0	0.0	3.9	1.4	5.9	1.7
Grade 1	12.7	6.6	3.8	4.1	16.9	12.3
Grade 2	9.9	8.0	4.7	2.1	12.2	11.1
Grade 3	2.7	6.9	5.5	6.7	14.1	18.4
Grade 4	3.1	8.5	3.7	2.5	16.0	11.2
Grade 5	1.7	5.6	3.3	0.2	0.9	1.6
All	4.3	6.8	4.8	2.8	11.5	10.4

Table 6. Average completion rate by grade organization and intervention type (enrolled in January 2012)

Grade	BRAC Rural		BRAC Urban		Banchte Shekha	
	Intervention	Control	Intervention	Control	Intervention	control
Pre primary	-	-	68.1	83.5	87.5	93.5
Grade 1	85.3	85.8	81.6	69.9	74.7	79.3
Grade 2	83.6	94.7	82.6	80.1	77.0	78.7
Grade 3	88.3	91.4	79.8	73.0	76.3	73.9
Grade 4	86.3	85.1	80.0	76.6	71.8	76.9
Grade 5	89.4	83.5	84.3	84.6	86.6	85.9
All	89.0	88.4	77.0	77.9	78.2	79.8

Table 7. Average student's transfer (admit other school) rate by grade organization and intervention type (from 2011 year data)

Grade	BRAC Rural		BRAC Urban		Banchte Shekha	
	Treatment	Control	Treatment	Control	Treatment	control
Pre primary	-	-	8.4	7.2	4.4	4.8
Grade 1	1.1*	9.8*	6.0	10.6	7.6	7.9
Grade 2	5.2	4.6	3.9	10.4	10.3	10.0
Grade 3	3.2	7.7	5.2	10.2	9.0	6.8
Grade 4	6.9	7.2	2.9	8.2	11.6	11.5
Grade 5	1.7	8.3	5.2	11.7	10.8	8.6
All	3.4*	7.4*	5.5*	9.6*	9.4	8.7

* denotes significant level at 5%, ** denotes significant level at 1%

Table 8. Average unknown students rate by grade organization and intervention type (from 2011 year data)

Grade	BRAC Rural		BRAC Urban		Banchte Shekha	
	Treatment	Control	Treatment	Control	Treatment	control
Pre primary	-	-	20.4	9.3	2.1	0.0
Grade 1	0.2	0.0	12.9	15.4	0.6	0.5
Grade 2	1.1	2.2	9.8	6.5	0.5	0.1
Grade 3	2.5	1.5	9.3	9.0	0.2	0.9
Grade 4	4.6	1.6	11.4	10.8	0.0	0.4
Grade 5	0.8	1.6	7.7	3.4	1.1	1.8
All	1.5	1.3	13.5	9.2	0.6	0.7

* denotes significant level at 5%, ** denotes significant level at 1%